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The dynamics of innovation contests using firm-hosted communities

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Abstract

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Firms pursuing an open innovation strategy have increasingly turned to individuals as sources of new ideas. Two main approaches are often highlighted. First, firms can use online innovation contests, where individuals submit ideas in competition for a prize. Second, firms can use firm-hosted online communities, drawing from collaborative efforts of individuals with more intrinsic motivations to participate. A central challenge in both cases is that firms often struggle to sustain participation and effort of participants on an on-going basis. A third hybrid approach, where firms establish community-based innovation contests, has been largely ignored by research, but seems to help firms to engage participants on an on-going basis. This study focuses on community-based innovation contests to understand how firms engage communities to participate in contest over time. I conducted fieldwork at two firms that have successfully run them for many years, Chicago-based T-Shirt firm Threadless and Phoenix-based automotive firm Local Motors. Over ninety interviews with firm employees and community members, over six months of on-site observation at the two firms' headquarters as well as internal documents and blog data have been collected and analysed. Based on this data the core of the thesis consists of three empirical chapters that examine how firms are able to engage the communities to participate in their contests on a regular basis. First, it shows that the addition of a community to contests increases contestants' opportunities to learn. In experiential learning, contests provide experience whereas the community provides room for reflection and learning. These learning opportunities motivate contestants to come back and create contest entries on an on-going basis. Secondly, taking a social identity perspective, the research shows how the firms are able to engage the community members continuously by creating a joint firm-community identity. Lastly, it explains how these firms are able to influence community members' perception of the tasks they are doing through the contest design. Firms are able to turn activities that have been traditionally regarded as work into a recreational activity.

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Chapter 1: Introduction to the DPhil thesis

1.1 Research background

For a long time firms have involved other parties in their innovation activities. Suppliers and lead users have been partners of firms in product development across many industries ranging from automotive to construction equipment (Clark, 1989; Herstatt & von Hippel, 1992; Von Hippel, 1986). Over the last decade the popularisation of the idea of open innovation as well as the advent of the internet have led to an increased adoption of innovation approaches that involve outside parties (Chesbrough & Crowther, 2006; Chesbrough, 2003; Howe, 2008).

Firms are making the use of the internet in particular to involve the wider public in their product innovation efforts (Nambisan, 2002). Everyday people can contribute to firms' ideas for new products as well as designs or help them in solving scientific challenges. Academics and managers have used multiple labels to describe this new approach. Most popular is "Crowdsourcing", a term which implies that firms are outsourcing part of their work to an anonymous, dispersed crowd on the internet (Afuah & Tucci, 2012; Boudreau & Lakhani, 2013; Howe, 2008). Alternatively, the term "Co-Creation" is used. This term avoids the negative connotations of "crowdsourcing", which comes with the suggestion that companies are outsourcing standard tasks and emphasises that the firms no longer create their innovation on their own, but give interested individuals an active voice in the creation process (Prahalad & Ramaswamy, 2004; Ramaswamy & Gouillart, 2010).

A number of different factors have driven the growth of this approach. On the one hand, firms can reach out to a larger set of individuals at a lower cost with less compromise on the richness of information they gather. Similarly, the internet allows

firms not only to interact with their customers, but also moderate and observe the interactions that users have over the internet with each other (Kozinets, 2002; Sawhney, Verona, & Prandelli, 2005). On the other hand, the public themselves have shown an increased interest in influencing the innovation activities of firms. Companies who take these perspectives into consideration are more highly regarded (Fuchs, Prandelli, & Schreier, 2010; Fuchs & Schreier, 2011).

As a result, firms ranging from Mercedes in automotive, to Eli Lilly in pharmaceuticals, as well as public organisations, such as NASA, have tried out or adopted these approaches. Well known examples are the first online developed car concept by Fiat, the Fiat Mio, the cosmetics firm Nivea, which developed a deodorant with an online community, and the Computer company Dell, which uses an online idea platform called Ideastorm that anybody can contribute to (Bayus, 2013; Bilgram, Bartl, & Biel, 2011). In addition to these large multinational firms that use these approaches as one element of their portfolio of innovation methods, small to medium-sized firms have emerged that almost exclusively rely on the wider public for their innovation efforts. Among these are firms focused on T-shirt design like the Chicago-based firm Threadless, fashion accessories, like the German firm Front Row Society, consumer products, like the New York-based firm Quirky, or cars, like the Phoenix-based firm Local Motors.

Firms can run this approach by themselves or engage a company to manage the process for them. Virtual knowledge brokers are third party firms that have access to a wide variety of individuals from the public and typically run a platform on which they can participate. Client firms can then tap into these resources and involve them under the management of the virtual knowledge broker (Verona, Prandelli, & Sawhney, 2006).

Most known amongst these is the US based platform Innoncentive which focuses on scientific problems that firms face in product development (Jeppesen & Lakhani, 2010).

Two main approaches have been identified as effective in involving members from the public. Firms can set up or collaborate with existing online communities (Füller, Matzler, & Hoppe, 2008; Jeppesen & Frederiksen, 2006; Nambisan & Baron, 2009, 2010). An online community in this context is understood as a group of individuals that communicate over an online platform and focus on a particular topic. Their conversations are frequent and substantial enough that personal relations between the individuals develop (Rheingold, 1993). These communities are a valuable resource for firms to tap into as they accumulate a lot of knowledge around a particular topic from members with a variety of backgrounds. Alternatively, firms can use online platforms to run innovation contests in which individuals compete to provide the best ideas for the firms (Jeppesen & Lakhani, 2010). Firms define a contest brief outlining what they are looking for, set out a prize for the best submission and subsequently evaluate the submissions they receive.

1.2 Research question and contribution

In line with firms' adoption of these approaches, significant research attention has focused on the involvement of the wider public in innovation (Füller et al., 2008; Jeppesen & Frederiksen, 2006). Most research has focused on the participants and the contributions they make. This is partly because researchers can gain easy access to these participants and the conversations they have are freely available on the internet. For instance, research has investigated the motivations (Jeppesen & Frederiksen, 2006; Nambisan & Baron, 2009), the characteristics (Dahlander & Frederiksen, 2012; Füller et

al., 2008), the effort that participants put in (Boudreau, Helfat, Lakhani, & Menietti, 2012) and the value of their contributions to the firms (Bayus, 2013; Poetz & Schreier, 2012). However there is little research on the role that the firm can play—particularly in terms of what needs to happen within the firms to make the collaborations with the public work (von Krogh, Wallin, & Sieg, 2012). Nevertheless, even the limited research that exists highlights that the actions of the firm and their behaviour towards the participants can have a significant effect on the success of these approaches (Porter & Donthu, 2008).

However, these approaches come with significant challenges. First, firms have to adjust to the fact that they are collaborating with a new type of partner, one that is different to suppliers or experienced lead users that they are used to working with (Dahlander & Magnusson, 2005). Secondly, the relationship with these partners is different. Participants from the public are typically hobbyists who have no contractual relationship with the firm and who can choose to participate as they like. As a result, many firms struggle with engaging the public successfully for their activities over time (Dahlander & Piezunka, 2012). It is challenging to initiate an online community and to encourage people to come back on a regular basis. Similarly, firms need to motivate contestants participate in contests on a recurrent basis if they want to implement this approach successfully (Bayus, 2013).

Research so far has provided insufficient answers as to what firms need to do to make these approaches successful (Porter & Donthu, 2008), particularly what firm practices are needed to create engagement and effort from those participating over time.

There is a further gap in contemporary studies of this phenomenon: Most research has considered collaborating with communities and running contests as two fundamentally different approaches. Yet, looking at the successful firms that have engaged the wider public for the innovation efforts over many years, it becomes clear that their approach does not clearly fall into either the contest or community category. These firms blend elements from both approaches. Firms are increasingly using what has been termed as community-based innovation contests (Bullinger, Neyer, Rass, & Moeslein, 2010; Hutter, Hautz, Füller, Mueller, & Matzler, 2011). Firms not only invest in the contests, but they set up a firm-hosted online community open to the wider public, therefore providing an online communication platform where people can interact. Often firms also make significant attempts to build up a sense of community in these online forums. Rather than letting an anonymous crowd compete against each other as in 'pure' innovation contests, the contestants come from the firm hosted online community. The community performs a number of functions for contestants. At the most basic level, it is a place for contestants and other like-minded members to socialise and exchange experiences among themselves. Yet, this hybrid approach is not fully understood.

To address these research gaps on firm-level practices for engagement and community-based innovation contests, this DPhil thesis focuses on the overall motivating question:

How do firms engage online communities to participate in innovation contests on an on-going basis?

The core of the DPhil thesis is made up of three empirical chapters with three more focused questions (figure 1). Each of these chapters looks at community-based innovation contests from a different perspective.

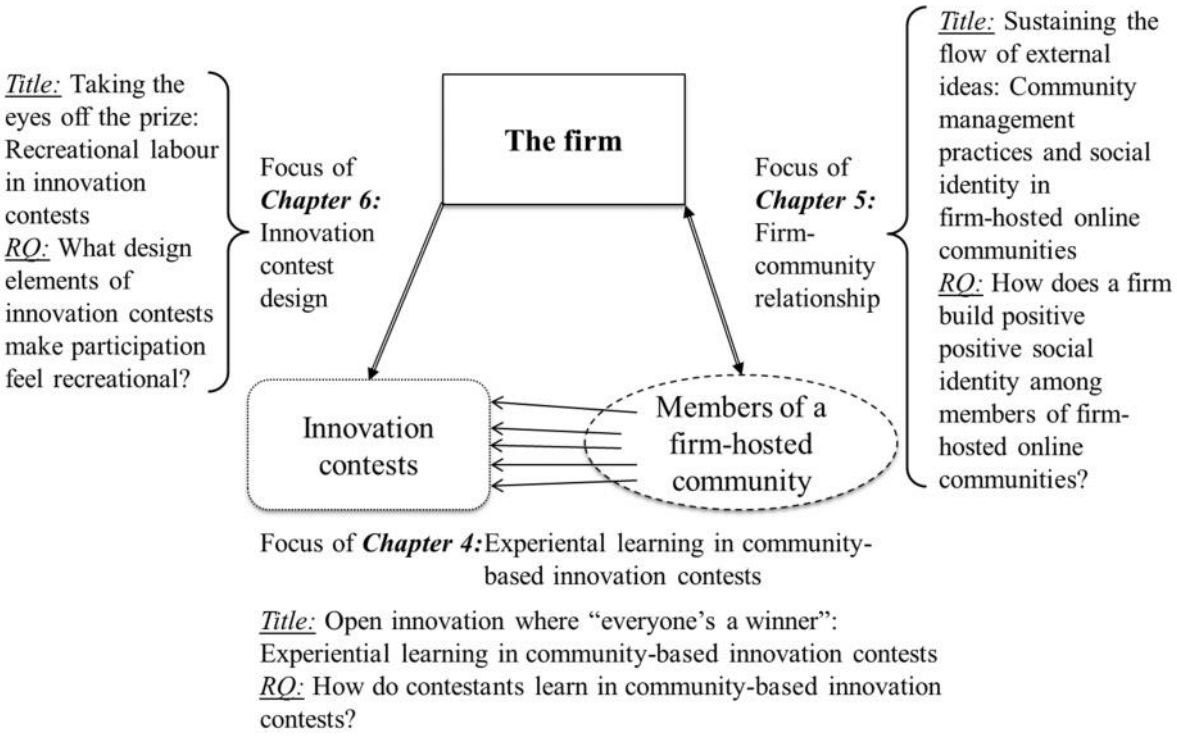


Figure 1: Focus of the empirical chapters of the DPhil thesis

The first empirical chapter (chapter 4) focuses on community-based innovation contests and focuses on the interplay between contests and the firm-hosted community. Using growth curve analysis this chapter shows that contestants who participate in the community learn significantly more than those who just participate in the contests. Furthermore, taking an experiential learning perspective (Kolb, 1984), I show that contests and communities complement each other in improving contestants' skills. While the contest provides contestants with concrete experiences, the community helps individual members to reflect on their experiences and learn from the knowledge and

perspectives of other contestants. The learning opportunities provided for contestants increase their motivation. Contestants therefore come back and participate on a regular basis. As such, this chapter looks at the strategic motivations of firms, exploring why and when it makes sense for them to combine contests and community.

The second empirical chapter (chapter 5) focuses on how the firms manage the relationship between themselves and the community to create engagement. This chapter shows that firms can engage community members by creating a positive joint firm-community identity. In other words they make external community members feel part of the firm. Firms become part of community members' social identity using two different types of practices (Tajfel, 1972, 1974). Porous boundary practices make community members feel as though they are part of the business. An example of such practices is openly sharing internal information with the community. In addition, support practices make community members feel valued by the firm. The participation of the firms' top management in community discussions is an example for such a practice.

The third empirical chapter (chapter 6) focuses on how firms design innovation contests. Contestants perceive creating contest entries as recreation. Using self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000b) this chapter shows how firms can engage contestants by facilitating this perception. Underlying this perception is the fact that firms can elicit the intrinsic motivation of contestants as they design contest entries. To achieve this end, firms need to attract contestants with an intrinsic disposition for the tasks, instil a feeling of competence in the contestants and give them sufficient autonomy for the intrinsic motivation to unfold. The findings of this chapter stand in

contrast to previous research on innovation contests that have emphasised the dominance of extrinsic motivators for contestants (Terwiesch & Xu, 2008).

In sum, these three chapters provide three complementary perspectives of the nature and impact of practices that firms use to create engagement for their innovation efforts. My research therefore responds to the multiple calls that have been made by other researchers to understand better the role and activities of the firm in collaborating with the public for innovation over the internet (Dahlander & Magnusson, 2005; O'Mahony & Lakhani, 2011; Porter & Donthu, 2008; von Krogh et al., 2012).

1.3 Research approach

Due to the nascent stage of research on community-based innovation contest and the role of firms, I adopted an inductive case study methodology (Edmondson & McManus, 2007; Eisenhardt, 1989). I focused on two cases of firms that have used community-based innovation contest intensively and successfully for a long period of time to generate new innovation. The strengths of such “ideal type” cases have been shown in prior innovation research: for instance, the study which focused on the product design firm IDEO (Hargadon & Sutton, 1997).

I was given unusually open access to two firms: Chicago-based T-shirt firm Threadless and Phoenix-based automotive firm Local Motors. Threadless has over the past thirteen years sold thousands of different T-shirt designs. These designs can be created by anybody who is interested and are then submitted to a general or topic specific contests. The firm has a community in which contestants, customers and other design

enthusiasts interact. The community also votes on the designs that are submitted to the contest. This is followed by a internal firm vote on the top scoring designs. The results of these votes form the basis of their decision about which designs to produce. Threadless presents five new designs every week. In addition it has run contests for partners such as US retail corporation Gap.

Local Motors was founded in 2008. It has run numerous automotive design and engineering contests since then. In 2010 it presented the first open source vehicle, the Rallyfighter, a car which is now produced as a small series at their factory in Phoenix. In addition to the contests Local Motors also has an online platform that provides a home for their online community, which focuses on vehicle design and engineering. In addition, Local Motors has over the years worked with several partners and has run vehicle design contests on their behalf. These partners include the US department of defence, BMW and the Pizza delivery firm Domino's.

To collect data, I spent around three months at the headquarters of each of these firms, conducting interviews with employees and contestants as well as observing key meetings and the day-to-day work they undertake with the community and contestants. In addition, I have collected online data concerning the activities of participants in contests and how they interact on the forums. The analysis and data collection has followed an iterative approach, where periods of data collection were broken up with analysis phases that helped to refine and focus subsequent phases of data collection (Miles & Huberman, 1984).

1.4 Structure of DPhil thesis

This thesis comprises a total of seven chapters (including this introduction). In the next chapter I review the literature on collaborations with the wider public for the purposes of innovation. It focuses on previous research on innovation contests, on innovation communities as well as on the limited research that exists on firm-hosted communities and community-based innovation contests. The gaps in the literature form the basis of my DPhil dissertation. This literature review will be complemented by reviews of the theoretical lenses in the respective empirical chapters.

In the third chapter, I explain the methodological choices that I have made and the selection of cases for this DPhil study. Furthermore, I provide an in-depth description of the cases that I have investigated as well as the data that I have been able to collect.

Chapter four is the first empirical chapter and focuses on how contests and communities complement each other in creating experiential learning. In chapter five, I show how firms create positive social identity for community members of firm-hosted communities. Chapter six focuses on contestants' perception of their work and explains why contestants regard the task of creating contest entries as recreation.

In chapter seven, the final chapter, I highlight the contributions of this DPhil research, point out its limitations and draw connections between the three empirical chapters. Finally, I highlight the policy and managerial implications that can be derived from my research.

Chapter 2: Literature review

2.1 Introduction

Involving external partners in creating innovation is not a new phenomenon. For many decades firms have worked with external partners to create innovation. These partners include other firms such as suppliers or alliance partners as well as individuals in the form of lead users (Sako & Helper, 1998; Sampson, 2007; Von Hippel, 1988). Much critical research has focused on these approaches to innovation (Clark, 1989; Von Hippel, 1986). More recently firm and research attention has shifted to firms collaborating online with members from the wider public for innovation– the focus area of this study.

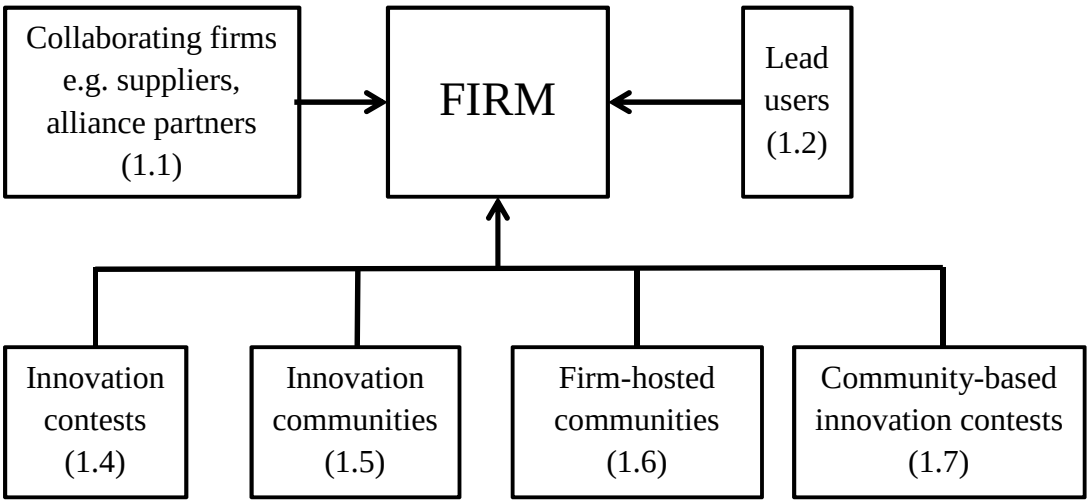


Figure 2: Collaboration partners for firm-based innovation
(relevant section of literature review indicated in parentheses)

This literature review will start by briefly looking at studies of lead users which many researchers see as the predecessor to research on online collaboration between firms and the public. Subsequently, this new wave of research on firms working with the wider public to create innovation over the internet will be reviewed. Initially I will present some underlying trends that have led to the recent growth in attention to these new approaches. Having done this, I will analyse the research on the two most prominent approaches:

namely, innovation contests and online communities, as well as the hybrid of community-based innovation contests. This will be followed by a critique of the research that has motivated and shaped the development of this study. Figure 2 summarises the sections of the literature review.

2.2 Leveraging lead users for innovation

Eric von Hippel (1986) first theorised the lead user method in the 1980s through identifying a leading set of product users. Lead users are characterised by two factors (Von Hippel, 1986; Von Hippel, 1988). First, lead users face new needs and experience those needs considerably earlier than the rest of the market. Secondly, they significantly benefit from innovation that addresses their needs. Von Hippel's approach assumes that lead users have the ability to innovate and that their needs will eventually become needs of all consumers (Bogers, Afuah, & Bastian, 2010).

Several studies have examined the innovativeness of lead users in a variety of settings. Urban and von Hippel (1988) looked at CAD software users. Classifying them as lead users and non-lead users, they found that 87% of the lead users innovated compared to 1% of non-lead users. There are similar results for other professional users such as for library information systems (Morrison, Roberts, & von Hippel, 2000). In addition, end consumers sometimes also possess lead user characteristics. Franke and Shah (2003), examining sports communities, found lead users with significantly higher innovation activity than other users.

These lead user characteristics have meant that firms have devised a method for involving them in their product development. This is termed the lead-user method. When

using this method, initially the firm defines the objectives for the lead user involvement (Lüthje & Herstatt, 2004). Then it has to search for and identify potential lead users interested in collaboration. Subsequently, it engages in a series of lead user workshops that help to develop novel product concepts (Lüthje & Herstatt, 2004). There is only limited research on the firm-level practices that are required in order to profit from the lead user method (Lüthje & Herstatt, 2004). Dedicated employees that facilitate the transfer of knowledge into the organisation have been suggested as one way of making use of lead users (Lüthje & Herstatt, 2004). Furthermore, it is important to involve lead users at an early stage in order to profit from them (Enkel, Perez-Freije, & Gassmann, 2005).

The research on the lead user method has provided strong evidence that firms can significantly benefit by involving outside parties in their innovation activities (Gruner & Homburg, 2000). Lilien and colleagues (2002) compared products developed with the lead user method with more traditionally developed products at 3M. They found that the sales of products created in conjunction with lead users were eight times more successful in sales than products following 3M's traditional process. 3M achieved these results in spite of the fact that many regard their innovation process as highly successful already (Lilien et al., 2002). Similarly, other work has found that PC-CAD systems that lead users helped to generate were strongly preferred over other available alternatives by a representative sample of users (Urban & von Hippel, 1988). Firms can profit significantly from ideas coming from leads users because of their ability to think divergently (Kristensson, Gustafsson, & Archer, 2004). Users outside the firm possess knowledge of their own needs and they have their own individual backgrounds which might provide

knowledge from domains very different from those of the firm. At the same time they do not have the same cognitive frame as the firm, including awareness of technical limits or industry standards regarding a particular technology (Kaplan & Tripsas, 2008). As a result of different knowledge and limits, they can recombine the knowledge and come up with ideas very different from those coming from within the firm (Ekvall, 1997). In this context, users that know less of the firm can often be more valuable than those who have had previous experience with them (Kristensson et al., 2004).

2.3 The rise of collaborative innovation with the public

Despite the fact that the phenomenon of firms using external partners is no new thing, over the last decade academics and managers have increased their attention to these approaches. Multiple new labels have been created to name these approaches such as open innovation, crowdsourcing or co-creation (Chesbrough, 2003; Füller, 2010a; Howe, 2008). The increase in the use of this method by firms and the associated research attention can be attributed to different motives.

The internet has changed the way in which companies interact with the wider public. Firms can reach out to a larger number of individuals without compromising on richness of information exchanged, as was traditionally the case with surveys (Sawhney et al., 2005). The interaction frequency between the firm and the outside individuals can also be increased because of lower costs (Sawhney et al., 2005). Furthermore, interactions no longer only need to take place between the firm and the individuals, but rather the firm can initiate and moderate or just observe interactions between different individuals: for example, customers in an online community (Kozinets, 1999). This enables the firms to

tap into the real-life experiences of customers with increased accuracy (Kozinets, 2002). Initial evidence suggests that these new opportunities to involve individuals over the internet can significantly improve the outcomes, costs and risks of the innovation process (Fuchs & Schreier, 2011).

At the same time, consumers have heightened their interest in influencing the innovation activities inside firms (Füller, Mühlbacher, Matzler, & Jawecki, 2009). Firms have accommodated this trend as interacting with the wider public has favourable effects on the purchasing behaviour of those involved and beyond. Having a positive experience when involved in a firm's innovation activities leads to increased consumer trust towards the company, supports a positive brand image of the firm and encourages word of mouth recommendations. In addition, the consumer's relation to the product is strengthened as well (Füller, 2010b). These effects can extend beyond the individuals actually involved. Consumers who know that a firm interacts with other consumers in product development perceive the firm as more customer-oriented and have higher purchasing intentions with regards to this firms' products (Fuchs & Schreier, 2011). These marketing benefits occur irrespective of whether the involvement of the wider public actually improves innovation, just as long as those participating feel that their opinion matters (Fuchs et al., 2010).

Lastly, fashion often drives the adoption of management techniques by firms (Abrahamson & Fairchild, 1999). Management consultants, publishers and business schools "push" ideas in order to generate business (Abrahamson, 1996). Therefore we might see the attempts by companies to involve members of the wider public via the internet in their innovation efforts as a fad. A decade ago, best-selling business books targeted at managers popularised the idea of open innovation, though it was by no means

a new idea. (Chesbrough, 2003). Subsequently, firms have increasingly adopted open innovation approaches (van de Vrande, de Jong, Vanhaverbeke, & de Rochemont, 2009). Involving the wider public in innovation can be seen as a form of open innovation. Some researchers see it also as a form of outsourcing and offshoring and thereby part of the increasing adoption of this strategy by firms (Eppinger & Chitkara, 2006; Terwiesch & Xu, 2008).

Researchers have suggested a variety of tools and approaches to get individuals to participate in the innovation efforts of companies via the internet. (Dahan & Hauser, 2002; Dahan & Srinivasan, 2000). The most promising of these, and those that have received most research attention, are the use of online innovation contests and online communities (Boudreau & Lakhani, 2009).

2.4 Contests for innovation

The past decade has seen a huge surge in public interest and participation in innovation contests. The internet has facilitated this trend, making it easier than ever to carry them out. However, they are not a new phenomenon (Leonhardt, 2007; Sawhney et al., 2005). Innovation contests have actually been a standard activity in architecture, advertising and management consulting for some time (Che & Gale, 2003). Furthermore, innovation contests have historically been used in fields ranging from automobiles to medicine and were often known by terms like “prizes” or “innovation tournaments” (Adamczyk, Bullinger, & Möslein, 2012; Davis & Davis, 2004). The British government

organized one of the earliest contests in the 18th century as they looked for a tool that could accurately measure the longitude at sea (Morgan & Wang, 2010). It was won by an amateur clockmaker John Harrison who created the chronometer (Sobel, 1995). In the last century a large number of contests occurred in the aviation industry. For example, in 1919 the Daily Mail offered a prize of ten thousand pounds to the first person who could fly non-stop across the Atlantic (Davis & Davis, 2004). More recently, in 1996 the Ansari X Prize offered USD 10 million to the first company who could create a spaceflight vehicle capable of sending private passengers into space. It was initiated by the X Prize foundation, a non-profit organization, which has since moved on to hold contests concerning the sequencing of the human genome and the creation of environmentally friendly cars (X-Prize-Foundation, 2011). Many of these early contests were not started by firms for their own products, but instead by governments and NGOS for the purposes of public policy and to stimulate progress and solve some of the pressing issues of the time (Kalil, 2006). While research suggests that the relevance of innovation contests as a public policy instrument is likely to grow to tackle problems of vaccines for diseases and agriculture in developing countries, climate change and learning technologies (Kalil, 2006; McKinsey&Company, 2009), in the last ten years firms have also increasingly started to use contests as a tool in their innovation efforts (Morgan & Wang, 2010; Piller & Walcher, 2006).

The early innovation contests are structurally similar to innovation contests that are run by firms today. They have a prize and they have a competition brief that sets out the criteria for winning. The ease of holding such innovation contests, because of the internet and new IT tools (Nambisan, 2002; Piller & Walcher, 2006), has meant that firms

can now employ them for developing ideas for ‘smaller’ problems such as what new products to develop in baby care (Poetz & Schreier, 2012).

I will now turn to the recent research on innovation contests. Table 1 provides details on key studies in this field.

Innovation contest design

Scotchmer (2004) distinguishes between targeted and blue sky prizes for innovation. Blue sky prizes are created after the event to reward someone for a great innovation. Targeted prizes are “posted ex ante. They reward solutions to needs that originate with sponsors, and the sponsor’s needs are formalized in performance standards that must be met to claim the prizes. The inventor’s idea is a solution to the sponsor’s stated need” (Scotchmer, 2004, p.40). As such innovation contests can be seen as targeted prizes.

Table 1: Key studies in innovation contests

Study authors	Research question	Empirical setting and methods	Main findings	Implications
Terwiesch and Xu 2008	• Do firms receive worse contest performance if they admit more contestants?	• Use of a quantitative theoretical modelling approach	• More contestants lead to reduced effort of contestants, but more contestants also lead to a more diverse set of solutions for the firm • The latter effect mitigates and sometimes outweighs the first • A performance-contingent rather than a fixed prize-award can increase effort	• Restricting entry to the contest is not always the best option for firms • Prize structure is important to manage effort
Schöttner 2008	• Are first-price auctions or fixed prize contests more favourable for firms holding innovation contests?	• Use of a quantitative theoretical modelling approach	• Contrary to previous research fixed-prize contests can be favourable for firms • If the quality of contestants strongly differs, higher quality contestants can ask for a significantly higher prize	• Firms need to consider carefully the prize structure and size of the prize
Jeppesen and Lakhani 2010	• What contestants come up with successful solutions to problems in open access contests?	• Quantitative analysis of 166 science problem contests involving 12,000 scientists on Innocentive.com	• With increased distance between original problem domain of knowledge and the solver's domain of knowledge the chances of a solution increase • Scientists in a distant technical field from the problem and scientists that were marginal to the respective field were most successful	• Innovation contests can help firms to tap into distant knowledge domains
Boudreau, Lacetera and Lakhani 2011	• When should firms restrict the number of contestants in innovation contests?	• Quantitative analysis of 9,661 innovation contest on the programming platform Topcoder.com	• For simple contests within a specific knowledge domain, restricting entry is best— additional contestants only reduce effort • For uncertain contests search benefits of openness outweigh the effects resulting from reduced effort	• The nature of the problem and level of uncertainty need to be considered when determining whether to restrict the number of contestants

One of the focus areas of research on innovation contests, particularly in economics, has been its design (Davis & Davis, 2004; Morgan & Wang, 2010). There are a number of design elements that firms need to consider in formulating innovation contests. Initially a firm needs to decide at what stage of the innovation process it is appropriate to use an innovation contest. Research has indicated that this can happen at multiple stages. For instance, firms sometimes use contests to generate new product ideas and concepts (Poetz & Schreier, 2012). Other firms use innovation contests to solve scientific challenges further along in the development process (Jeppesen & Lakhani, 2010). Then there is the size of the prize, which is often a vital factor in attracting contestants. Unsurprisingly, the higher the prize the more contestants typically want to participate (Yang, Chen, & Pavlou, 2009). Related to this point is the structure of the prize. For instance, the prize could either be a winner-take-all or multiple prize model (Morgan & Wang, 2010). Prizes can also take the form of first-price auctions instead of using fixed prizes. Typically in an innovation contest a firm sets a prize up front for the contest. This has also been referred to as a fixed-prize contest. Alternatively, a contest is run and contestants ask for a price that they want to have for their ideas (Che & Gale, 2003; Fullerton, Linster, McKee, & Slate, 2002). Research suggests that this reduces the burden for the firm holding the contest. They do not have to calculate an appropriate prize beforehand (Schöttner, 2008). This method can help contestants with low quality innovations win by asking for a lower prize. Some evidence suggests these auctions create a more competitive contest situation which can be beneficial for the firm running the contest (Schöttner, 2008). Further evidence places a caveat on these observations. In cases where the quality of contestants strongly differs, auctions will be to the

disadvantage of the firm holding the contest. Higher quality contestants can ask for a significantly higher price, if they know of the quality of the other contestants. In these situations a fixed prize is preferable (Schöttner, 2008). Another alternative to fixed-prize tournaments is the provision of performance contingent prizes (Terwiesch & Xu, 2008). The winning contestant will be paid based on how well his idea does. This can take the form of royalties paid to the winner. This method has the advantage of increasing the effort of contestants. Hard work not only enlarges their chances of winning, but also the size of the prize (Terwiesch & Xu, 2008).

Related to these parameters are the victory conditions (Kalil, 2006). If these conditions are too open, the contest might not go into the desired direction. If they are too strict, creativity might be limited and no solution found (Kalil, 2006).

A further challenge in contest design is the number of contestants that a firm should be willing to accept in order to achieve the best possible results (Davis & Davis, 2004). The more contestants that there are, the lower the chance there is for individual contestants to win. Furthermore, in most contests investments are sunk meaning contestants cannot use what they do elsewhere (Che & Gale, 2003). As a result, contestants reduce effort and firms receive a worse result as the number of contestants increases (Taylor, 1995). Some researchers therefore claim that to achieve optimal results firms need to limit the number of contestants (Fullerton & McAfee, 1999). The costs associated with evaluating contest entries provide another reason for limiting the number of contestants (Fullerton & McAfee, 1999). From an economics standpoint in most cases

the optimal number of contestants is two (Che & Gale, 2003). This number creates competition, but also keeps the chances of winning high. Therefore, two equal contestants will exert most effort as each of them has a 50% chance of winning (Terwiesch & Xu, 2008). Nevertheless, some recent studies have challenged the idea of restricting entry. While the evidence does support the hypothesis that allowing a higher number of contestants decreases effort, it also suggests that opening up a contest can provide firms with a more diverse set of ideas. These benefits of diversity can outweigh losses caused by the decreased effort of the contestants (Terwiesch & Xu, 2008). Further research has pointed out that the focus of the contest is important in determining whether restricting entry or having free access achieves better results. For simpler contests where the solution is relatively straightforward in a specific knowledge domain, restricting entry is best (Boudreau, Lacetera, & Lakhani, 2011). Additional competitors reduce effort, but provide little extra benefit through wider search. In contrast, if an innovation contest is focused on identifying a solution which might come from different domains of knowledge, the search benefits of openness outweigh the effects resulting from reduced effort (Boudreau et al., 2011).

The way a firm deals with contestants of different skill levels is another a central design element (Morgan & Wang, 2010). The skill levels of contestants have an impact on the effort that they exert. Superstar contestants with exceptional qualities make other contestants perform worse (Boudreau et al., 2012). Investigating this trend, research has found that it is not necessarily less effort that drives the decline in performance. The largest decline in performance in fact comes from contestants with high ability (Boudreau et al., 2012).The decline in performance can be attributed at least partly to increased

cognitive errors as a result of more competition (Boudreau et al., 2012). Exceptions to this rule are contestants with very high ability. They were capable of coping with the pressure and actually increased their performance with more superstar contestants participating (Boudreau et al., 2012). This research also shows the decline in performance of average contestants depends on the quality of the new contestants. Superstars have a stronger negative effect than non-superstars on average contestants (Boudreau et al., 2012).

If a firm follows the idea of restricting entry to the contest, it is in their interest to prevent weaker contestants from entering the contest. They can achieve this result by charging an entry fee that deters those whose expected profit from entering is lower than the fee (Fullerton & McAfee, 1999). The difficulty with entry fees is setting the right level to attract enough but not too many contestants. Consequently, if firms know how many contestants are appropriate, auctioning off entry is a successful strategy (Fullerton & McAfee, 1999). This way the firm will end up with a higher number of skilled contestants as they will pay higher fees due to their expected profits.

Intellectual property rights are a central issue in innovation contests. In contests geared towards public policy, it is sufficient that a contestant creates an innovation and then potentially commercialises it. In commercial innovation contests, firms need to have some way of either licensing or buying the idea that wins (Kalil, 2006).

Innovation contests offer important benefits. From an economics and public policy perspective, they provide an alternative to patents (Scotchmer, 2004). Some consider patents as problematic when incentivizing innovation. It has been argued that patents overly reward innovators beyond what is needed for progress. They subsequently hinder

progress as others can no longer use the innovation in their own development programmes (Gallini & Scotchmer, 2002). Given these problems concerning patents, innovation contests can provide an incentive to pioneer without the monopoly on profits that the innovator would get if they were to take out the patent (Gallini & Scotchmer, 2002). This rests on the assumption that a potential public sponsor can set a suitable prize, identify the best idea and subsequently make the innovation available for public benefit and further progress. For instance the World Health Organization has considered offering prizes to create incentives for the development of new, low-cost vaccines (Kremer, 2000).

Innovation contests can also play an important role in the creation and stimulation of industries (Masters & Delbecq, 2008). The development of the agricultural engineering industry, as well as most of its progress between 1839 and 1939, has been attributed to a series of contests initiated by the Royal Agricultural Society of England (Brunt, Lerner, & Nicholas, 2011). The prizes led to a significant increase in firms active in the industry and improved agricultural engineering, particularly in the areas where prizes were offered (Brunt et al., 2011).

Running innovation contests offers further benefits for firms. In contrast to other approaches, in innovation contests the firms only have to pay if a successful idea is found. The firm does not pay for failures (Terwiesch & Xu, 2008). Firms can broadcast their problem to a large pool of contestants (Jeppesen & Lakhani, 2010; von Krogh et al., 2012). The contestants typically have different backgrounds and expertise. These variables increase the chances of finding a suitable idea (Che & Gale, 2003). As a result of involving contestants, firms can also increase their innovation capacity (Terwiesch & Xu, 2008).

The ideas that come about because of innovation contests can outperform the ideas generated by internal R&D. Looking at an innovation contest at an Austrian baby products company, Poetz and Schreier (2012) examined the product concepts developed and submitted online by consumers and compared them with those developed by internal researchers from the company. They found that professionals were significantly less innovative than the participating consumers. The consumers developed most of the ideas that scored high in novelty and consumer benefit, while being only slightly worse in terms of the feasibility of implementation (Poetz & Schreier, 2012).

Contestants' motivations and characteristics

A limited amount of research has looked at the motivations of contestants in innovation contests specifically. Nevertheless, the majority of research, particularly the studies which take an economics perspective, assumes that contestants are mainly motivated by the size of the prize and their chances of winning it (Boudreau et al., 2011; Boudreau & Lakhani, 2009; Che & Gale, 2003; Terwiesch & Xu, 2008). This is surprising when considering findings on open innovation more broadly. Examining why Volkswagen GTI enthusiasts would be willing to participate in product development, a recent study found that their interest in innovation, and the innovation process, was what drove their willingness to participate, not their affection for the brand or other rewards (Füller et al., 2008). In addition, their perceived knowledge and perception of having the right skills to innovate were important drivers (Füller et al., 2008). This fact suggests that

personal attributes and interests, not only economic motives, drive peoples' willingness to participate.

Some initial research has started to uncover other factors that drive contestants' effort in innovation contests beyond extrinsic rewards. Looking at the US programming contest webplatform TopCoder, Boudreau and Lakhani (2011) described how contestants were given a choice to compete in a team or individually. If they were then allocated to different contest designs based on their preferences, they outperformed those that were not allocated based on their preferences. Contestants that were sorted according to their attitudes and preferences worked much harder, putting in much more time. This resulted in a much higher performance in problem-solving. The size of this effect was the same as the difference between offering a USD1000 prize and USD 0 prize (Boudreau & Lakhani, 2011). This research points to the fact that the environment in which contestants compete has a significant effect on the motivation of the contestants. At the same time, this environment will look different for different contestants—some prefer collaboration, others to work on their own.

Innovation contests are typically marked by heterogeneity in contestants' characteristics. As described above, this heterogeneity can create challenges: some contestants might not have the necessary skills, adding extra burdens in terms of evaluation and decreasing the effort of other contestants without providing significant benefits (Fullerton & McAfee, 1999). At the same time, one of the advantages of innovation contests is that individuals with different backgrounds can work on the problem posed. This enables firms to find solutions to problems where the relevant knowledge is in domains that they would typically not know of or consider relevant (von

Krogh et al., 2012). To investigate what type of contestants are most valuable to firms, recent research looked at innovation contests run on Innocentive (Jeppesen & Lakhani, 2010).The results show that the contestants who are at the margins of the problem domain are most successful, not those that are closest to it. Marginal contestants have technical knowledge far away from the domain the problem is set in. Socially marginal contestants are those that are denied equal access to the core group (Jeppesen & Lakhani, 2010). Jeppesen and Lakhani (2010) operationalize socially marginality using gender, as women are more likely to be socially marginalised. They find that both technically and socially marginal contestants are more likely to solve problems (Jeppesen & Lakhani, 2010).

Yet research also points to the fact that contestants' value for firms might decrease over time. Looking at Dell's Ideastorm, a recent study has found that contestants who submit multiple ideas are more successful than those who only submit one (Bayus, 2013). Interestingly, after having been selected by Dell once, contestants are less valuable. They try to replicate their past success and, as such, suggest ideas that are similar to what they initially proposed (Bayus, 2013). As the firm has already realised their initial idea, they do not use these new ideas.

Management of innovation contests

Knowing the theoretical design of an innovation contest is not the same thing as managing one. As we have seen from other research on collaboration for innovation, firms need to create or adapt practices, organisational arrangements and even their culture to make them work (Langner & Seidel, 2009). Furthermore, research looking at firms

piloting the use of innovation contests has suggested that long-term use will require change in firms' practices if they want to profit from the contest (Piller & Walcher, 2006).

The firm first needs to decide on its level of involvement. Firms either run innovation contests themselves, providing the platform and engaging with contestants, or they decide to work with a virtual knowledge broker who runs the contest on their behalf. Innocentive is an example of such a virtual knowledge broker (Verona et al., 2006). Virtual knowledge brokers typically have a set base of potential contestants who are registered on their platform. Based on the request of another firm, they set-up and manage a contest, subsequently giving the results to the client firm for evaluation. Besides, taking away part of the work and expertise required to run a contest, knowledge brokers also reach and involve contestants that would not typically engage with a particular firm. The firms' own sites are mostly visited by their own customers. Knowledge brokers can connect the firm to other groups of contestants, perspectives and domains of knowledge (Verona et al., 2006). As such, they are similar to classical knowledge brokers such as IDEO. These brokers connect firms with knowledge and ideas from other, often unrelated, industries (Hargadon & Sutton, 1997; Verona et al., 2006).

A limited amount of research specifically gives an account of what firms running innovation contests actually did in practice, particularly what made them successful or not. A critical managerial issue that has received attention is the creation of the contest brief. The contest brief sets out that what firms are looking for from contestants and what criteria will be applied when selecting an entry. Contest briefs are critical for innovation contests. Often firms fail to find a solution to their problem because they have not created a suitable contest brief (Jeppesen & Lakhani, 2010). Creating the brief poses significant

challenges to established firms. Employees often reject the idea of holding innovation contests. Even when they approve, they struggle to formulate a competition brief as it requires a completely different perspective on the problem than their regular work. They define the problem too narrowly and base it on their previous experience, not putting themselves into the position of contestants who have different backgrounds and less knowledge or experience in the specific domain (Sieg, Wallin, & Von Krogh, 2010). Successful firms introduced "guides" that were both scientists and experts on innovation contests that helped in the problem selection, formulation and management (Sieg et al., 2010).

Firms also underestimate the resources and work it takes to manage the contest, for example in evaluating entries or providing feedback to contestants. Furthermore, firms struggle to identify the right problems. They often select "Holy Grail" problems—those problems that they could not solve internally for a long time (Sieg et al., 2010). As a result, the firms set too high objectives for a solution while trying not to reveal too much as potential competitors might get insights into the firm.

Von Krogh and colleagues (2012) identified how firms who used Innocentive successfully for innovation contests formulated their problem. Based on interviews with managers and employees from firms as well as Innocentive, they describe a process where firms generate "shareable problems" for innovation contests (von Krogh et al., 2012). They note three stages: in problem generation, the sponsors and coordinators motivate scientists to write a problem statement (von Krogh et al., 2012). Subsequently, in problem separation, the firms disentangle the problem from their organisational context

by incorporating the contestants' perspectives. In problem publication, they manage legal risks and competitive issues (von Krogh et al., 2012).

2.5 Innovation communities as alternatives to firm-based innovation

The term community is widely used with often very different meanings (O'Mahony & Lakhani, 2011). This literature review analyses communities of individuals who innovate (West & Lakhani, 2008). It has to be noted that others have also looked at communities of firms that collectively innovate (e.g. Allen, 1983; Nuvolari, 2004).

With regards to communities of individuals, Adler and Heckscher (2006) point out that all individuals need to rely on others. For this they need to trust in other people. In a broad definition of community, community is essential in allowing this trust to exist. In this context, community is understood as "the set of institutions that give basis for this confidence, by establishing and enforcing mutual expectations – so that when I do something I have some idea of how you are likely to react, and how it will all come out" (p.13). Three main forms of community emerge from this definition: Gesellschaft, Gemeinschaft and collaborative communities (Adler, Kwon, & Heckscher, 2008). We can distinguish these terms using the three core dimensions of communities: namely, their values, their organisation, and the members' identities. Following on from their definition, Heckscher and Adler (2006) argue that all forms social organisation have a community element.

Gesellschaft is a form of community that underlies the market. Price is the main coordination mechanism in the market. However this market has underlying moral values

that most participants share. These include behaving rationally, respecting the legal system and honouring contracts. The core assumption is, nevertheless, that members will follow their own interests (O'Mahony & Lakhani, 2011). The identities of the members in this Gesellschaft are independent of one another (Adler & Heckscher, 2006).

A firm is a Gemeinschaft type of community. Based on community values such as loyalty, honour and duty, individuals depend on each other to operate the firm. Individuals in this community have clearly defined roles that they have to fulfil to make the whole work (Adler et al., 2008). The identities of individuals are based on their status in the Gemeinschaft. As is typical for Gemeinschaft, this form of organisation has a clear boundary identifying people as insider or outsider (Adler et al., 2008).

The third and relatively new form of community and social organisation is the collaborative community (Adler & Heckscher, 2006). It is the "demand for complex, knowledge-based and solutions-orientated production in the modern capitalist economy that has stimulated significant progress towards a new form of community" (Heckscher & Adler, 2006, p.12). The collaborative community differs significantly from the first two types. Values such as trust take on a more prominent role. Community members share common values and a goal. This goal becomes the basis for the coordination of activities amongst members. Community members are interdependent when it comes to achieving this goal (Heckscher & Adler, 2006). Consequently, defining the main goals of the community is central for its functioning, as it defines who wants to, and can, participate. There is an absence of hierarchy, contracts or predefined formal roles. Instead there is only lateral authority (Dahlander & O'Mahony, 2011). Therefore, the relations and friendships between members are important for building the necessary trust and sense of

responsibility towards the community. Core values are collegiality, and a focus on, and contribution towards, the collective goal (Adler & Heckscher, 2006).

The collaborative community is particularly well-suited for the exchange and creation of knowledge (Adler et al., 2008; Dahlander, Frederiksen, & Rullani, 2008; Lee & Cole, 2003). The reason for this, particularly for online communities, is that they bring together individuals with different backgrounds, often from different cultures that share the same affinities and interests (Dahlander et al., 2008; Lee & Cole, 2003). As such, it seems logical that most of the innovation communities, offline and online, are types of collaborative communities. The most well researched innovation communities in the last two decades are certainly open source software communities that exhibit all of the characteristics of the collaborative community (Dahlander et al., 2008). Table 2 shows key studies on innovation communities.

Table 2: Key studies in innovation communities

Study authors	Research question	Empirical setting and methods	Main findings	Implications
Von Hippel and von Krogh 2003	• Why do open-source community members invest their time into the development of a product that is freely available?	• Theoretical paper	• Open source software follows a private-collective innovation model • Community members receive private benefits such as recognition and learning that are only available when participating in the creation of the public good	• Private benefits that derive from participation are an important component of innovation communities
Von Krogh, Spaeth and Lakhani, 2003	• How do community members join the innovation community?	• Inductive single case study design of the Freenet open source community	• New members must show a certain level of activity before they are granted access to the development part of the community • There are contribution barriers that regulate who can contribute to what in the community	• Innovation communities have clear rules and protocols that ensure functioning of the innovation process
O'Mahony 2003	• How do innovation communities protect their intellectual property?	• Inductive case study methodology of six open source software communities	• Communities use six ways to protect their innovation • Use of software licenses that restrict proprietary appropriation, use legal sanctions, transfer rights to non-profit foundation, create brands, assign trademarks to the foundation, protect the brand	• Innovation communities carefully monitor commercial use of their ideas and protect their intellectual property
O'Mahony and Ferraro, 2007	• How do innovation communities govern their activities?	• Inductive case study of the Debian open source community as well as deductive hypothesis testing	• Communities set a constitution to govern their work • They combine bureaucratic and democratic control—create leadership positions, but limit leaders' power (limited authority over technical decisions, leaders can be recalled) • Leaders were chosen based on merit (technical and/or organisational contributions)	• Innovation communities develop elaborate governance systems and procedures

The typical open source community is not associated with a firm, but is independent. In fact, some see it as an alternative to the firm innovation model (O'Mahony, 2007; Ulhøi, 2004). The communities are open to anybody who is interested and has the necessary skills (Hertel, Niedner, & Herrmann, 2003; O'Mahony, 2007). The size of the collaborative communities in open source greatly varies. The majority of them are fairly small communities. Looking at one hundred mature open source projects, it was found that the median number of contributors was four and the mean 6.6 (Krishnamurthy, 2002). The highest number of contributors in any of these projects was 42 (Krishnamurthy, 2002). Nevertheless, the most well-known communities such as the Linux-kernel community have had several thousand contributors (Hertel et al., 2003).

The lack of a hierarchical structure makes the governance of the innovation activities particularly important (Bonaccorsi & Rossi, 2003). The community is the central place for coordination. It is where the individual contributions of members are integrated (O'Mahony & Ferraro, 2007). The members in these projects typically communicate in dedicated online forums and via mailing lists (Hertel et al., 2003; von Krogh & von Hippel, 2006). To achieve this collaboration, members set joint rules to govern and regulate how they create the software (O'Mahony & Ferraro, 2007). A central principle for the projects to work is modularity (Baldwin & Clark, 2006). The community sets technical standards and requirements for the overall software that ensures that the individual pieces of code, developed by different community members, will subsequently fit together into one product (Langlois & Garzarelli, 2008).

After they establish these ground rules for the work packages, individual members can pick the packages that interest them to program (Langlois & Garzarelli, 2008).

Despite their collaborative and egalitarian structure, the communities typically have leaders that manage and coordinate the process (Langlois & Garzarelli, 2008). The leadership ensures that the packages are assembled correctly and that the system as a whole works (Langlois & Garzarelli, 2008). These leaders are often democratically elected (O'Mahony & Ferraro, 2007). Community members become leaders if they have made significant contributions to the community either on a technical level or in terms of how they connect members from different areas together (Fleming & Waguespack, 2007; O'Mahony & Ferraro, 2007). Although these communities are open, newcomers do not automatically become part of the development team. Members often need to follow a specific 'joining script.' This means that they have to perform to a certain level and demonstrate technical skill before they become developers in the community (von Krogh, Spaeth, & Lakhani, 2003).

The rules the community sets not only ensure integration and quality. They also guarantee community members are rightfully acknowledged for their contributions and that whatever they produce is openly available. For instance, the Linux kernel project had a community protocol that clearly specified how members should cite other members' work and make their contributions openly available (Lee & Cole, 2003). The open sharing that communities often implicitly or explicitly prescribe is a key component for enabling innovation. It makes the knowledge available to others, who can then use, combine, or extend it (Lee & Cole, 2003). Equally important is the fact that the sharing inside the community opens contributions up for criticism and review. These techniques ensure the quality of the ideas and produce methods by which they might improve (Lee & Cole, 2003). Given this model, some researchers have claimed that this form of creating

innovation is superior to the traditional firm type model (Raymond, 2001). The democratic process and discussions guarantee that errors are detected and only the best ideas adopted (Hertel et al., 2003; Raymond, 2001). A particular strength of innovation communities is that the error identification process happens concurrently with the development (Kogut & Metiu, 2001). The majority of members are involved in identifying the errors, more than the actual developers. Furthermore, in contrast to commercial products, the actual users are part of this process. Their questions and concerns, which they post in the forums, can be incorporated in the product directly (Kogut & Metiu, 2001). This advantage is reflected in Raymond's (1999) famous quote regarding open source development: "Given enough eyeballs, all bugs [errors] are shallow" (p.23).

These innovation communities therefore create products for the public good, which are available to anyone who wants them. The distribution is particularly easy for open source software, as anyone can share the final product at virtually no cost over the internet (von Krogh & von Hippel, 2006). Furthermore, open source products are also joint in supply which means the use of the software by one person does not preclude another user from using the software (O'Mahony, 2003).

The fact that the product is made freely available also resolves many of the problems and criticisms typically associated with the limits intellectual property law imposes on future innovation (Kogut & Metiu, 2001). Other people can build on what the community has created as long as they acknowledge the contribution. They therefore can create further innovation (von Krogh & von Hippel, 2006).

Even though the product developed by the innovation communities is typically freely available, this does not mean that the communities do not protect their work (O'Mahony, 2003). On a basic level open source software is typically protected by one type of open source license (West, 2003). All open source licenses have in common that the property rights to the product use are placed in the public domain (Kogut & Metiu, 2001). Differences between licenses include the rules on whether products building on the product, or modifications to it, can be privately sold or not (Kogut & Metiu, 2001). The communities enforce these licenses informally if a community member breaks them, or formally through legal action if, for instance, a company abuses the product (O'Mahony, 2003). Often these communities also create foundations that holds the copyrights and create brands and trademarks to protect their product (O'Mahony, 2003).

There are other innovation communities beyond open source too. There are studies of communities in which members develop cars, 3D printers, or even recipes for beer (Raasch, Herstatt, & Balka, 2009). In these communities, software like computer added design (CAD) becomes critically important as the participants discuss the development of physical goods online. A further central challenge these communities face is production of the physical good (Raasch et al., 2009). One way to handle these problems, as was shown in the case of 3D printers, is to rely on readily available standard components that each community member can buy (Raasch et al., 2009). Other communities focus on creating products without actually producing them. Niketalk, an expert community focused on the development of basketball shoes, is one typical example. Community members develop concepts for new sports shoes. In doing so, they

hold ‘friendly’ challenges, asking questions such as what they think a basketball shoe would be in 2050. After these challenges, the members jointly critique and further develop the shoe concepts. The quality of the results, both from a technological as well as creative point of view, can be seen from the fact that some of the consumers are later actually taken on as official designers by sports shoe manufacturers (Füller, Jawecki, & Mühlbacher, 2007).

There are also innovation communities in offline contexts. In fact, open source communities existed before the internet (Hertel et al., 2003). Examining an offline community in the rodeo kayak industry, Baldwin and colleagues (2006) have shown the ability of innovative consumers to develop the dominant design in this industry. They demonstrated that different rodeo kayak users explored and developed rodeo kayaks, thereby jointly optimizing designs while building on their collective inventions within the community. Users had an incentive to innovate and build their own kayaks until they developed a model that satisfied a majority of user needs and best exploited the solution space. Once this came into being, it became the dominant design for rodeo kayaks.

The central advantage of online innovation communities over offline communities is one of reach. Bringing together a sufficiently large number of interested and capable individuals is a challenge in online communities, but even more in locally restricted offline innovation communities. Another advantage of the online community is that the anonymity of these communities means that members who ordinarily might not

participate, because of personality or other personal restrictions, do so (Palloff & Pratt, 1999).

Overall, innovation communities come in different forms. Kozinets and colleagues (2008) classified online innovation communities in two ways. First, they ask whether the collective innovation orientation is either teleospecific (only focused on innovation) or communo-ludic (innovation being a sub goal of the community). Second, they ask whether the collective innovation process involves a limited set of contributors or a wide mass.

Innovation community members' characteristics and motivations

The majority of participants in innovation communities are hobbyists who contribute to the communities' development efforts for free either in their leisure time or sometimes during idle time at work (Hertel et al., 2003; Shah, 2006). Nevertheless, they often apply the skills, for example in programming, that they have acquired in or for their day job in the community (Jeppesen & Frederiksen, 2006; Kogut & Metiu, 2001). Conversely, they often bring the skills they acquire in open source back to their job. It was only after firms had realised the strengths that these communities had for innovation that some of them started to pay employees to participate in them (Dahlander & Wallin, 2006), as will be further discussed in the next section.

That these communities create products that are freely available is one factor that motivates members to participate. Members showed similar motives as had been found in social movements (Simon et al., 1998). For instance, in the case of the Linux kernel

community, important drivers were participants' political viewpoint, their identification as a Linux user and motives related to the reaction of friends and family to their involvement (Hertel et al., 2003).

Another characteristic of the members of innovation communities is that they have a need for a new product. Much as lead users discovered that firms' products no longer satisfied their needs (Von Hippel, 1986), innovation community members often start a community or participate in one as the products currently available do not satisfy them (Jeppesen & Frederiksen, 2006; von Krogh & von Hippel, 2006). For instance, members typically initiate open source software projects to meet their own needs (Hertel et al., 2003; von Krogh & von Hippel, 2006). In this context another factor influencing community members' motivation to contribute to the community and the creation of a product is its structure. If a community adopts a modular architecture, members will be more likely to join and continue to participate as they will be able to exchange their work with other developers and thus profit more (Baldwin & Clark, 2006).

In their well-established private-collective innovation model, von Hippel and von Krogh (2003) argue that the success of open source software at least in part rests on the fact that multiple levels of benefits exist in the creation of open source software. As community members contribute to the collective good, the development of the software, community members receive private benefits that are only available if they participate. These benefits include recognition from other community members for their contribution and skill improvement and learning through participation (Von Hippel & von Krogh, 2003). Private benefits also include that community members signal their high level of

technical skill to potential employers and thereby get career advantages in form of employment offers or even a higher salary (Hertel et al., 2003; Lerner & Tirole, 2002).

The effort that members invest into the community and its development activities also depends on the dynamics of the community and the relation they feel to the community. Members who believed that they had the skills to contribute and who felt that their contribution was critical to achieve the goals put in more work for the community (Hertel et al., 2003; Lakhani & Wolf, 2003). Not only perceived but actual skills are important motivating factors. Members who could change the technical characteristics of the project were more motivated than those who were not innovating (Franke & von Hippel, 2003). In this context, the community members' social identity was important. Community members that believed that they were valuable members of the community contributed more and their actions were also more helpful to the community's objectives (Bagozzi & Dholakia, 2006). These factors suggest that intrinsic motivation, the enjoyment of writing code, is an important motivator (Lakhani & Wolf, 2003). The effect of these motivators changes with the maturity of the community. While early on the need for the product often is a main driver, in mature projects the joy of programming keeps developers involved with the community (Shah, 2006).

Extrinsic motivators also are at play. The community members' status and the desire to attain a higher status in the community are strong motivating factors (Stewart, 2005). As firms have started to get involved with innovation communities, paying their employees to participate, the salary that members receive also motivates them (Roberts, Hann, & Slaughter, 2006). For instance, IBM paid programmers to participate in both the

Linux and the Apache project (Roberts et al., 2006). The evidence on the role that firms have in innovation communities will be discussed in the following.

2.6 Firms and innovation communities

The potential of innovation communities, and the competition they bring, has meant that firms in software and beyond have started to make communities a part of their innovation efforts (Bonaccorsi, Giannangeli, & Rossi, 2006; O'Mahony & Lakhani, 2011). These firms have started to involve innovation communities in different stages of their innovation activities, ranging from ideation to product testing (Kim, Bae, & Kang, 2008). In general, firms have made use of communities following three different strategies, which differ in terms of firm involvement and investment. On the lowest level, firms monitor what is going on in innovation communities. They use techniques like netnography that can provide them with insights on what the communities discuss and thereby help them to develop new products (Bilgram et al., 2011; Kozinets, 2002). On a second level, firms start to get involved in existing innovation communities by paying employees to participate (Dahlander & Wallin, 2006; West & Lakhani, 2008) or by encouraging key members of the community to work with the firm (Füller, Bartl, Ernst, & Mühlbacher, 2006). A challenge that firms using this approach face is that they have relatively little control over the community (Dahlander & Magnusson, 2008). On the third level, firms start to sponsor firm-hosted communities (Dahlander & Magnusson, 2005; Jeppesen & Frederiksen, 2006). This approach will now be considered in depth. Table 3 shows key studies that have been conducted on firm-hosted communities for innovation.

Firm-hosted communities

Firms from software to clothing to automotive have started to use firm-hosted communities for their innovation efforts (Anderson, 2010; Brabham, 2010; Maria & Finotto, 2008). There are different forms of firm-hosted online communities that are relevant for innovation purposes. A large number of firms possess comment forums and user communities (Jeppesen & Molin, 2003). The former provide a platform for users to give feedback to the firm and report problems, the latter typically focus on user to user support on how to use a product or deal with problems (Jeppesen, 2005). Both types of firm-hosted community can provide insights to firms on how to improve their products or provide ideas for new products. But these are by-products of their main functions (Sawhney et al., 2005).

Increasingly, businesses have started to use firm-hosted online communities dedicated to the creation of product ideas. They differentiate themselves from the previously mentioned online communities insofar as member discussion and support focuses on the creation process (Ogawa & Piller, 2006). Looking at different firm-hosted communities, Dahlander and Magnusson (2005) point out that firms and communities

Table 3: Key studies in firm-hosted communities

Study authors	Research question	Empirical setting and methods	Main findings	Implications
Jeppesen and Frederiksen 2006	• Why do users contribute to firm-hosted online communities for innovation? • What are the user characteristics?	• Single case of the Propellerhead Software online community, a Swedish music software firms • Multi-method based on interviews, web-log from the online community and two questionnaires	• Innovative users are likely to be hobbyists that use work-related professional knowledge to innovate in their hobby fields • They are not motivated by peer but by firm recognition. • Most possess lead user characteristics.	• Firms actions matter in engaging community members in firm-hosted communities
Porter and Donthu 2008	• Do firms efforts to provide quality content, foster embeddedness and encourage interaction increase members trust towards the firm? • Does trust increase the willingness to disclose information and participate in innovation activities?	• Survey of 663 customers who stated they have been or are involved in firm-hosted online communities; • Quantitative hypothesis testing	• Firms effort to provide customers with quality content and to foster member embeddedness have significant trust building effects; efforts to encourage interaction have no significant effect • Trust encourages information sharing with companies and willingness to participate in innovation	• Firms need to create trust with community members • Different firm-practices can be effective
Nambisan & Baron 2010	• What motivates consumers to provide support in online communities or contribute to the company's innovation activity?	• Online Survey of community participants in Microsoft and IBM communities; • Quantitative hypothesis testing	• Members' sense of responsibility to the community is strongly associated with community support • Perceived partnership to the company important for co-innovation, private rewards less important	• Firms need to manage the relationship with the firm-hosted community
Dahlander and Frederiksen 2010	• How does the members' position in the community and across multiple communities influence their innovativeness?	• Inductive multi-method case study of the firm-hosted Propellerhead Software online community	• Core members of the community are more innovative, but being at the very core negatively impacts innovativeness • Members that are part of multiple communities are more innovative	• Not all members are the same • Firms need to identify top members

might have very different relationships. They distinguish parasitic, commensalistic and symbiotic relationships. In parasitic relationships the firm mainly tries to profit from the community without making investments. This form is unstable and typically leads to the end of the community (Dahlander & Magnusson, 2005). In commensalistic relationships, the firm gains the acceptance of the community, whereas in symbiotic relationships both community and firm gain from the firm involvement in the community. In symbiotic relationships, firms have the highest influence over the activities of the community. In parasitic ones, this influence is non-existent (Dahlander & Magnusson, 2005).

Benefits of firm-hosted communities

Products created by firm-hosted communities can create significant value. Japanese retailer Muji has an online community of more than four hundred thousand members. This community suggests and evaluates new product concepts for them. The most successful of these products, a beanbag sofa, has generated sales that were 50 times higher than an average Muji product (Ogawa & Piller, 2006).

Firm-hosted user communities can provide firms with an ideal setting for testing new products. They provide a space for businesses to test product ideas, concepts and early versions during the development process (Jeppesen & Frederiksen, 2006). What is more, these communities are places where user innovation is shared. These innovations build on the original product offered by the firm to accentuate the product with functionalities that were missing, but were deemed useful by users, or needed to fix bugs (Jeppesen & Frederiksen, 2006). These innovations provide firms with information on the

needs of users which can then be used as insights for the firms' development projects. Often the product extension can even be directly incorporated by the firms into new versions of the product (Jeppesen & Frederiksen, 2006).

Firms also initiate firm-hosted innovation communities without actually having any interest in what the community develops for their own products (West & O'Mahony, 2008). Sometimes businesses use firm-hosted open source communities to control the development in a particular area and to use the community to promote and diffuse their source code. This allows them to be able to sell complementary products or just to build their brand in a particular product space (Dahlander & Magnusson, 2008; West & O'Mahony, 2008).

Members of firm-hosted communities

The studies which investigate the characteristics of community members that innovated in firm-hosted online communities focus on user communities in particular. The majority of innovators are hobbyists that do not earn their income from the domain that the community focuses on. At the same time, they often bring skills from their professional activities, for instance in programming, to this hobby (Jeppesen & Frederiksen, 2006). Innovators in firm-hosted communities often share the characteristics of lead users in other user communities (Jeppesen & Frederiksen, 2006). This observation also highlights a primary driver for their innovation. They innovate because some of their main needs are not satisfied by the firm's product (Von Hippel, 1986; Von Hippel, 1988). To satisfy these needs, they modify and extend the product.

Members in online communities take on different roles. Typically the contributions of community members to the community are unevenly spread. A small number of members at the core of the community often make most of the contributions (Lakhani & von Hippel, 2003). At the same time there are members at the periphery who hardly contribute at all. Kozinets (1999) distinguishes between members based on their interest in the community topic and the social ties with the community. He presents four types of community members. Tourists just browse through the communities when they need information. They have few ties to the community and little interest in the topic. Minglers are primarily interested in the social aspect of the community. In contrast, devotees have a strong interest in the topic, but weak ties to the community. Lastly, insiders maintain strong ties with the community while having a strong interest in the topic (Kozinets, 1999).

The position of a member affects how innovative they can be and thereby how valuable their contributions to the firm are. Being a member that is in the core group of the community positively impacts innovation performance (Dahlander & Frederiksen, 2012). Dahlander and Fredericksen attribute this trend to the fact that these members are more credible to the rest of the community. As such, others accept and support their ideas. At the same time, being at the very core of the community negatively impacts innovative performance of community members. Members become too inward looking with regards to the community (Dahlander & Frederiksen, 2012). Furthermore, a community member's innovativeness is impacted by how many other communities he is a member of. Peripheral members that span multiple boundaries are more innovative than those who are part of just one community. The focus of the other communities a member participates in

also has an impact. Membership of other technical communities positively affects innovativeness (Dahlander & Frederiksen, 2012).

Members of firm-hosted communities are motivated by a variety of factors as well. For firm-hosted communities, Nambisan and Baron (2010) highlight different motivators for community members' contributions to the firm-hosted community rather than to the firm. Using survey data from community members in the firm-hosted communities of IBM and Microsoft, they show that a sense of responsibility to other community members drives people to provide help. This effect was amplified as members felt loyalty with the community. A feeling of commitment to the community increases the quality of the members and the number of contributions they make to the firm-hosted community (Wiertz & de Ruyter, 2007). Further drivers of community support were status enhancement and learning through participation.

In return for helping the firm, community members expect to be part of an innovation partnership, and so feel like an equal partner that the firm shares information with (Nambisan & Baron, 2010). This partnership was more important than gaining private rewards from the firm. Similarly, other research found that community members were not motivated by peer recognition as has been typically found in other forms of non-firm-hosted online communities (Lakhani & von Hippel, 2003; Von Hippel & von Krogh, 2003). Rather they look for recognition for their efforts from the hosting firms (Jeppesen & Frederiksen, 2006).

Challenges for firms and management of firm-hosted communities

Firms trying to use an online community for innovation face the central challenge of how to start such a community. It can be hard to attract developers even in open source communities dedicated to creating products for the public good. Motivating people to invest a significant amount of work over a long stretch of time is hard and often fails (Krishnamurthy, 2002; Lerner & Tirole, 2001). Data on a large sample of open source community implies that only very few communities take-off. These communities get the most attention and are then able to draw in many other members. Most communities, however, linger and never take-off (Krishnamurthy, 2002). Similarly research on firm-hosted open source communities has reported on how difficult it is for firms to start a community and attract and retain members with the right interests and set of skills (Dahlander & Magnusson, 2008). Often despite their good efforts, there are not enough interested individuals on the internet to get a firm-hosted community off the ground. Dahlander and Piezunka (2012) point out that firm-hosted communities beyond software face the same problems.

In addition, online communities are very different to the departments or units that managers typically work with. An online community cannot be started or managed like a department in an organisation. Instead they require the interest of outside individuals to volunteer to participate in the firm's innovation efforts for little or no financial reward. In addition, firm-hosted communities have strong elements of self-organisation (Jeppesen & Frederiksen, 2006). Consequently, the firms have to deal with a form of organisation over which they have at best limited control (Dahlander et al., 2008; Dahlander & O'Mahony, 2011): "Individuals can decide where to work, who to work with and what to work on,

making it difficult for firms to steer the direction of development" (Dahlander et al., 2008, p.116). Thus the firm has to be open and flexible to what a community comes up with. Alternatively, firms have to find new ways of coordinating and motivating the community to work in the direction that they want without alienating the community (Dahlander & Magnusson, 2008).

Beyond the lack of control, firms working with firm-hosted user communities also have to learn how to support community members in carrying out their part of the innovation process (Jeppesen, 2005). If done improperly, the costs associated with supporting members can outweigh the innovation benefits (Jeppesen, 2005).

Innovation communities are based on the principle of openly sharing information with other community members and collaborating with them. Firms are not used to freely sharing internal information with or collaborating with outside parties they cannot control. Firms generally only strategically share some information to promote their standard or product: for instance, by making the source code available in their firm-hosted community, but not opening up their development to the community and taking on their ideas (West & O'Mahony, 2008). This illustrates a further challenge: the objectives of the members of the communities and the interest of the firm are often not aligned (Bogers & West, 2012; West & O'Mahony, 2008). While the community is interested in developing open source software, the firm wants to promote their product. Alternative conflicts centre around the open sharing of the community's work. This is rarely in the interest of the firm, if they want to use it commercially (Dahlander & Magnusson, 2008). This means firms need to find new solutions that unite their own and their community's interests (Dahlander & Magnusson, 2008). Examples found in open source are hybrid

business models. The firms focus on developing complementary products whereas the communities focus on developing and maintaining the core product (Bonaccorsi et al., 2006; West & Gallagher, 2006).

Communities are based on strong norms and values. Firms that want to profit from the communities need to find not only ways to understand these norms and values, but also ways to make sure their way of using the community honours and respects these norms and values (Dahlander & Magnusson, 2005).

Even when firms have managed to get over these obstacles, they are faced with the problem of how to deal with the information and ideas that the community creates. In contrast to innovation contests, firm-hosted communities are less structured. At the same time, successful communities are full of knowledge and ideas and typically generate new ones every day. As such, identifying solutions that are valuable to the firm is a challenging task and requires a lot of attention (Berg-Jensen, Hienerth, & Lettl, 2010; Dahlander & Magnusson, 2008).

Limited anecdotal evidence exists on what firms do and need to do in terms of managing their firm-hosted online communities. Researchers have pointed out that beyond providing the forum for discussions of community members, and tools for members to share content, some firms employ community managers that follow the communities (Sawhney et al., 2005). The culture and attitude towards the communities' ideas is critical for encouraging firm-hosted communities to innovate. The Swedish firm Propellerhead, which focuses on computer-based musical instruments, profited greatly from its user community because the firm recognised the value of users' ideas early on

(Jeppesen & Frederiksen, 2006). Looking at the platform design of Ebay's firm-hosted community, Dholakia and colleagues (2009) have found some community design features impact on community members' behaviour. Members identify more strongly with the community when have the ability to display their reputation to other members. Furthermore, community management by employees is important for proper functioning of the firm-hosted community (Dholakia et al., 2009).

Some researchers have tested their ideas of how firms could deal with selecting product ideas from communities. Looking at Lego, Berg-Jensen and co-authors (2010) find that by quantifying the complexity of product ideas, something that is easier for Lego than most other products, firms can better identify valuable ideas. They find an inverse U-shaped relationship between product complexity and attractiveness to Lego (Berg-Jensen et al., 2010). Furthermore, they show that relying on community feedback can help firms to identify the most valuable ideas from their firm-hosted communities (Berg-Jensen et al., 2010).

Firm managers need to become community members in order to have some control over the direction of the communities. If they are deeply involved and core members, they are able to influence community members, irrespective of their position in the firm (Dahlander & Magnusson, 2005).

In one of the few studies that focuses on what firms can do to motivate a firm-hosted community, Porter & Donthu (2008) show that building trust in the community towards the firm is vital for making community members want to contribute to the firm (Porter & Donthu, 2008). Firms that provide quality information and foster member embeddedness in the community make community members feel respected by the firm

and highlight to the community that the firm shares the same values as the community. This relationship leads to trust from community members and makes them contribute to the firm's product development efforts (Porter & Donthu, 2008).

Even more recently, Dahlander and Piezunka (2012) have looked at a large sample of firm-hosted online suggestion communities and investigated what differentiates firms that are able to engage communities from firms whose communities die. Testing different practices they find that engagement by the CEO in community discussions and accepting the suggestions made by the community had a positive effect on community engagement (Dahlander & Piezunka, 2012).

2.7 Community-based innovation contests

The majority of recent research has considered communities and innovation contests as two alternative means for involving the wider public in firms' innovation activities. They are suitable in different situations however (Boudreau & Lakhani, 2009). Contests are best suited when a broad search for an idea is needed, encouraging variety, whereas communities are better when cumulative knowledge, with community members building on each other's work, is needed (Boudreau & Lakhani, 2009). Most research suggests that community and contests can be used sequentially at different stages of the development process, but typically not simultaneously, or even in combination. For instance, Pharamaceutical firm Eli Lilly uses communities for patient involvement and contests for involving outside scientists in problem solving (Sawhney et al., 2005).

Nevertheless, firms have started to use innovation contests and communities simultaneously as part of one approach. In these cases, the community becomes a place for interaction amongst contestants (2010). Research on community-based innovation contests has provided some initial evidence as to how the community can add value to innovation contests. It has shown that, in this hybrid form, competition during the contests and cooperation through helping other contestants improve their entries can co-exist (Hutter et al., 2011). Furthermore, it could be shown, through experiments, that even contestants with little knowledge could improve significantly through the feedback provided by the community (Adamczyk, Haller, & Moeslein, 2011). Table 4 shows the limited number of studies that exist on community-based innovation contests so far.

Table 4: Key studies in community-based innovation contests

Study authors	Research question	Empirical setting and methods	Main findings	Implications
Bullinger, Neyer, Rass and Moeslein 2010	• If and how does cooperation in a competitive context lead to innovativeness?	• Single case study of a community-based innovation contest at a German university using observation, focus groups and a survey of contestants	• Contestants that cooperate a lot and those that do not cooperate are most innovative • Those that do not cooperate also have a very high competitive orientation • Those that have a high cooperativeness benefit from knowledge spill-overs • Contestants with medium-level cooperation are less innovative	• There are differences in contestants' desire to cooperate in community-based innovation contests • Different strategies of contestants can lead to innovative contributions
Hutter, Hautz, Füller, Mueller and Matzler 2011	• Can contests and collaborative communities co-exist?	• Inductive analysis of the OSRAM LED light design contest case using observational data of the contest and network analysis	• Collaborative and competitive behaviour co-existed throughout the contests • Contestants share information amongst each other and support each other in the development of their contest entries • They term this behaviour 'communitition'	• Contests and community can be combined • Community-based contests are successfully applied by large companies

2.8 Critique of previous research

As I have shown, in the last decade there has been a substantial increase in research on how firms work with outside partners to create innovation as well as how individuals collectively create new products independent of firms. The internet has played a key role in two respects. Firstly, it has facilitated the use of these approaches by firms and individuals. Secondly, the internet has provided relatively easy access for researchers to investigate these approaches. Surveys can easily be sent out to participants of online communities as they can be reached via the communities' mailing lists. Researchers can download data about discussions in such communities as it is openly available to anybody on the internet. This ease of access to specific data concerning these phenomena has influenced both the topics as well as the methodological choices that researchers have made with regards to their projects. I will, in the following, critique this previous research on both innovation contests and innovation communities and highlight the implications these readings have had for this project.

Research on innovation contests

Most of the research on innovation contests has adopted an economics perspective (von Krogh et al., 2012). As such the research assumes that contestants are rational and make decisions on participation and effort based on the likelihood of rewards. The effort of contestants has been a focus of several papers (Boudreau et al., 2011; Che & Gale, 2003; Terwiesch & Xu, 2008). As I have shown, they focus on how sponsors of contests can ensure that contestants exert maximum effort. This has been investigated particularly

in relation to how the number of contestants, or their quality, influences the chances of winning and how the prize needs to be structured to elicit effort. As a result there seems to be a good understanding on the relation between effort and extrinsic rewards in contests. Nevertheless, most of this research assumes that extrinsic rewards, mostly monetary, are the central driver of contestants' behaviour. Some researchers even point to innovation contests as a special case where non-financial motivators do not play a role: "A remarkable exception to non-financial motives is the innovation contest" (Terwiesch & Xu, 2008, p.1529).

This focus on monetary extrinsic rewards is an oversimplification for several reasons. Looking at innovation contests, we need to consider who is competing with whom for what. Most of the traditional research on innovation contests understood innovation contests as larger scale contests. This typically meant either of two types of contests. The first type of contest occurs when a firm that wants to procure research and development from another firm, such as a supplier for a new product. Prizes were often multi-million pound R&D budgets or even contracts to supply the developed component for the production of a product (Langner & Seidel, 2009). Alternatively, there were large-scale public innovation contests, like the historic examples described earlier. In these contests both firms and scientists competed for high prizes that aimed to induce technological progress. Yet the nature of innovation contests has changed. These days much smaller contests are possible. Firms submit R&D problems to sites like Innocentive offering just a couple of thousand pounds as a reward (Jeppesen & Lakhani, 2010). Those participating are no longer only firms or highly qualified scientists, but people from the general public. As a result, we cannot be certain that what we have learnt from the large

amount of research focusing on professional contestants and firms can be applied to these smaller contests with more 'amateur' contestants. This is particularly true considering the rich research on motivations in online communities reviewed above. Members there have been shown to have a multitude of motivators including a focus on extrinsic monetary rewards, but also other extrinsic rewards, such as being recognised by the firm (Jeppesen & Frederiksen, 2006) or intrinsic rewards such as learning.

It is only recently that research has started to acknowledge that other motivations for contest participation, aside from winning a prize, exist. Looking at programming contest firm, TopCoder, programmers have been found to participate to increase their job prospects, to learn and improve their skills, and also because they enjoy competition (Boudreau et al., 2012; Boudreau et al., 2011)—similar motives as found in online communities. Furthermore, researchers have started to investigate the motivating effects of the contest environment and whether it meets the contestants' preferences. These studies have shown that great increases in effort can be achieved, if contestants work in an environment that suits their preferences (Boudreau & Lakhani, 2011). Yet to date, we know little about how these contest's environments elicit effort and the underlying psychological processes that lead to increased effort and performance. All this points to the fact that research investigating innovation contests beyond extrinsic motives is needed.

As alluded to at the beginning of this section, the availability of online data has determined the research approaches and topics that have been pursued. In terms of recent research on innovation contests, these showcase mainly quantitative approaches that lend themselves to a rational economic perspective. Looking at the data sources that have been

used for this work, we can see that it uses mainly quantitative data from the contest platforms such as Innocentive and TopCoder. Very little other data on contestants has been used. We only have seen limited observational data or interviews on how contestants view and behave in innovation contests. The little evidence points to a somewhat different picture in motivation. It might be the interest in innovating or the challenge rather than eventual payoffs that motivate contestants (Füller et al., 2008). To understand the multifaceted motivations of contestants, qualitative approaches that aim to understand the actual expectations and experiences of contestants are needed.

The ease and availability of contest data from online contest sites has meant that the unit of analysis has been mainly the contestants and their behaviour (von Krogh et al., 2012). Yet this research does not help us to understand how firms run innovation contests in practice. It does not explain what firm practices are needed to make contests successful. For instance, we do not know how firms need to interact with, support, or care for contestants. There is very little research on how to attract individuals to innovation contests and how to engage them to make them participate (Adamczyk et al., 2012). In particular, the role of the firm in making users participate has yet to be explored (Füller et al., 2008; Poetz & Schreier, 2012). As a result other researchers have called for research on how firms carry out contests in practice (Terwiesch & Xu, 2008; von Krogh et al., 2012), suggesting the need for studies that show how firms change their roles, practices and processes to do so. So far there exists only limited research on the role of the firm in innovation contests (von Krogh et al., 2012). This qualitative research showed how many firms struggle in preparing and successfully using innovation contests. For firms, it is not simply about deciding to hold a contest and knowing how to structure it, but also adapting

to managerial challenges, such as how to change their internal culture, structure and processes when doing so (Sieg et al., 2010).This means that research looking at what firms need to do internally to run contests successfully is valuable. Again a qualitative perspective given the nascent stage of prior knowledge is promising (Edmondson & McManus, 2007). Overall, there has been significantly less research on innovation contests than on innovation communities.

Research on innovation communities

Research on innovation communities has initially only analysed self-standing communities. Subsequently, research attention has shifted as firms increasingly have come to work with communities (Dahlander & Magnusson, 2005; Dahlander & Wallin, 2006). Nevertheless, compared to the work on innovation communities to date relatively little research has investigated the role of firms and their relation with communities.

With regards to self-standing innovation communities, research has provided a good understanding on the multifaceted nature of the motivation of members ranging from extrinsic to intrinsic motivation. Furthermore, the operating and governance of these communities is well understood. Research has been both quantitative as well as involving in-depth qualitative case studies (O'Mahony & Ferraro, 2007). The main criticism of research in this area is that the vast majority of research has focused on one type of setting: open source software communities.

In contrast, we have very little research on firm-hosted communities, though these communities are growing and present a valuable resource for firms. Again a large amount

of this research focuses on firm sponsored open source communities (Dahlander & Magnusson, 2005; West & O'Mahony, 2008). Outside open source software most of the research focuses on either firm-hosted user communities such as in the cases of Propellerhead, Microsoft and IBM, that are initiated and maintained by firms primarily for product support (Dahlander & Frederiksen, 2012; Jeppesen & Frederiksen, 2006; Nambisan & Baron, 2009, 2010), or suggestion communities that provide a platform for firms to interact with customers about products, product problems and improvements (Dahlander & Piezunka, 2012; Di Gangi & Wasko, 2009). While research has shown that they can provide important benefits for firm innovation, for instance through the product modifications that users develop (Jeppesen & Frederiksen, 2006), we have yet to understand firm-hosted communities that are entirely dedicated to the firms' innovation process. Even the research that did not look at firm-sponsored open source communities, mainly considered communities focused on software products.

Methodologically there has not been a lot of qualitative work on firm-hosted communities except for open source communities and the multi-method work on Propellerhead (Dahlander & Frederiksen, 2012; Jeppesen & Frederiksen, 2006). To get a more complete picture, qualitative work looking at other industries and product categories, particularly physical goods such as cars, is necessary.

While existing research has provided us with an initial understanding of the motivations of members in firm-hosted communities, most research has assumed that these members have lead user characteristics (Von Hippel, 1986; Von Hippel, 1988): namely a strong self-interest in their innovation and a need for an improved product. The wider reach of firm-hosted communities means that members who are innovating with

firms are not necessarily lead users. Rather than having the need for an innovation, they might just enjoy creating new products (Füller et al., 2008). This change has implications on the motivations of members and why they collaborate with firms. As a result, when focusing on firm-hosted communities dedicated to innovation, we need to understand how and why these non-lead users work with firms.

The focus of analysis for most research on firm-hosted communities has been the community or individual community members. This can at least to some extent be attributed to the convenience of easily accessible online data concerning community members and their interactions. Despite the fact that research has shown that working with communities is challenging for firms, hardly any research has been done on how firms can work successfully with firm-hosted communities to create new products. We know much more about what community members in firm-hosted online communities do in general and for firms in particular than we know what firms do for firm-hosted online communities (Dahlander & Piezunka, 2012). This is surprising given the fact that researchers have pointed out that many firms fail to get value from sponsoring online communities and that the actions of the firms have a significant impact on whether firm-hosted communities work or not (Porter & Donthu, 2008). Furthermore, other research streams on collaborative innovation, such as on firm-supplier collaboration, have demonstrated that suitable firm skills are crucially important if two types of organisations want to jointly create innovation (Monczka, Petersen, Handfield, & Ragatz, 1998; Petersen, Handfield, & Ragatz, 2003; Ragatz, Handfield, & Scannell, 1997).

In identifying the big research gaps that currently need to be addressed with regards to firms and online communities O'Mahony and Lakhani (2011) raise four

questions for further research. One of these is “What organizational skills are needed to create an external community willing to contribute to a firm’s innovation goals?”(p. 27)

Furthermore, research has mostly focused on the firm or the community. Hardly any research has considered the perspectives of these two parties in combination while they work together to create new products.

Looking at the limited research that exists on how firms successfully engage firm-hosted communities, some more methodological questions emerge. Despite the nascent stage of knowledge in the area (Edmondson & McManus, 2007), the research has used a deductive quantitative approach. Theoretically deriving a set of firm practices, Porter and Donthu (2008) have tested how firms can create trust in online communities towards the firm and thereby drive contributions. An inductive qualitative approach seems more appropriate given the lack of previous research in this area. The deductive approach has a priori narrowed down the potential practices and explanations on how firms can engage communities and thus might have missed more important drivers of community engagement. At the same time, the constructs that they test are still relatively high level because of their survey based data. They suggest that firms should provide quality content and foster member embeddedness without giving much detail on what doing this would entail. This makes the findings less practical and actionable for practitioners.

All this points to the need for research inductively exploring the practices firms need to successfully work with their online communities for creating innovation.

Lastly, only recently has research analysed the combined use of communities and contests in community-based innovation contests. To date we only have a limited

understanding of this hybrid approach, in particular what advantages it might bring to the stand alone use of innovation contest or firm-hosted communities.

2.9 Implications for this DPhil research

This DPhil research focuses on community-based innovation contests. As such the research gaps in the two broader fields of innovation contests and firm-hosted communities have important implications for my research. As shown, with both innovation contests and firm-hosted communities, we have a very limited understanding of what firms can do in practice to make these approaches work. The same applies to the little researched approach of running community-based contests. As such, my research focuses primarily on the role and practices of the firms and their impact on the contestants and the communities. The DPhil addresses the research question:

How do firms engage online communities to participate in innovation contests on an on-going basis?

In the next chapter, I will outline the research methodology adopted for this project.

Chapter 3: Research method

3.1 Introduction

This chapter outlines the research methodology adopted for this DPhil. I have adopted an inductive case study methodology looking at two case studies. These focus on the Chicago-based T-Shirt firm Threadless and the Phoenix-based automotive firm Local Motors. First, I will discuss the advantages of the case study methodology, highlighting its appropriateness for this research. The chapter will then discuss some insights resulting from the pilot study for this DPhil that motivated the choice of cases. Subsequently, I will present the case selection, followed by an introduction of the main characteristics of the two cases. I will then outline how I collected my data and analysed it.

3.2 Methodological choice

Methodological fit in field research is important in the design of a study. A key determinant for the appropriate methodology is the state of previous research in the area (Edmondson & McManus, 2007). As shown in the literature review, community-based innovation contests are a new phenomenon. Furthermore, our understanding of motivation in innovation contests, beyond extrinsic motivators, is limited, as is the amount of extant knowledge on how firms can engage contestants. Consequently, this project aims to understand how firms interact with online communities to encourage participation in innovation contests. By doing so, it can be categorised as nascent theory research. Nascent theory research is defined as follows: ”These topics have attracted little research or formal theorising to date, or else they represent new phenomena in the world” (Edmondson & McManus, 2007, p1161). Nascent theory research has the best

methodological fit with inductive theory development (Edmondson & McManus, 2007). In line with that I adopted an inductive case study approach (Eisenhardt, 1989).

At the outset of my research, I started the fieldwork without a priori hypotheses concerning the key ways firms might be able to engage online communities for contests over a long period of time. Consequently, I knew that performing this nascent theory research would require rich data (Edmondson & McManus, 2007). Combining multiple sources can provide the needed rich data. For my own study, I observed how the companies operated, conducted interviews and collected blog data (Yin, 2003). I used this data to understand the two companies fully. In my research, the companies, their firm-hosted communities and the relationship between the two was included within the case boundaries (Punch, 2005). The rich data I gathered helped to differentiate between contextual factors and the more relevant themes and constructs for explaining why the companies were able to engage their communities in contests. For instance, a number of the firm practices I identified are salient to firm members, only through complementing interviews with observation and blogs was I able to identify them and verify them in subsequent rounds of interviews. The data I used in my cases is mainly qualitative with the exception of contest panel data from Threadless. Qualitative data was best suited for this research for a number of reasons. It provides extremely rich data. This type of data is needed in order to identify partially hidden, latent themes and constructs of the companies (Miles & Huberman, 1984). It is well suited to find causality, which is particularly important as I was interested in how firms' actions lead to community engagement (Maylor & Blackmon, 2005; Miles & Huberman, 1984). Qualitative data also allowed for me to understand meaning (Maxwell, 2005; Miles & Huberman, 1984). To understand

how the community was engaged it was essential to complement what the firm did with the meaning of what these actions had to community members.

In line with typical nascent theory research, my thesis aims to contribute what Edmonson and McManus (2007) have described as a 'suggestive theory'. For instance, the second empirical chapter (chapter 5) identifies the importance of the community members' social identity for their commitment to the firm as well as how the firm can influence members' social identity. My research is the first that has identfied the crucial role of identity for community engagement and the underlying firm practices that facilitate it. This theory is suggestive as it highlights the phenomenon and identifies the relevant firm practices, but has limitations. For instance, it is not able to determine the relative importance of different firm practices. This would be something for subsequent intermediate and mature theory research to examine.

3.3 Pilot study

From April to August 2011, I carried out a set of exploratory interviews and field observation for my research. The aim of the activity was, first, to understand better the processes and the players involved in firm innovation with the wider public over the internet. Secondly, I wished to investigate whether studying firm-level practices was an interesting area of research from the practitioner's point of view. Thirdly, I sought to evaluate the feasibility of the study, identify appropriate research sites and to initiate contact with these research sites.

I conducted 17 interviews focusing on the topics above. The interviews lasted between 45 and 90 minutes. The interviewees represent a broad sample of the relevant parties involved from the firm-site in consumer co-creation (see Table 5). They include both established firms and new SMEs that have engaged in consumer co-creation. Virtual knowledge brokers focus on facilitating consumer co-creation. Online community providers run online-communities for innovation on behalf of mostly established firms as well as consultants that are active in the relevant industries. In addition, I attended two professional conferences focusing on co-creation over the internet. In June 2011, I went to the Crowdconvention in Berlin, as well as the Co-Creation Conference of the Product Development and Management Association (PDMA) in Phoenix, Arizona.

A number of insights emerged from these pilot studies. First, large and established firms showed a substantial interest in how best to use new online innovation approaches. The multinationals that I spoke to had already piloted the use of these techniques and were planning further projects using them. At the same time, these firms openly admitted that their knowledge of how to use these approaches was still at an early stage. As such, they encouraged me to focus on the firm-level practices needed. However, they did not feel ready to open up their own projects to research at this time.

Secondly, the virtual knowledge brokers that I spoke to were interested in the topic, but also held the perspective that their practices rather than the firms' practices were critical. This is not surprising as part of their business model is lifting as much of the burden of managing these projects away from the firms. At the same time, they emphasised that their practices and strategies were highly critical for the success of the approach.

Table 5: Exploratory interviews

Position	Firm name	Type of firm	Location of interviewee
Head of R&D strategy	BMW	Multinational	Munich, Germany
Head of open innovation	Siemens	Multinational	Munich, Germany
Chief Engineer	Quirky	SME	New York, USA
CEO	Quirky	SME	New York, USA
Founder	Threadless	SME	Chicago, USA
Creative director	Threadless	SME	Chicago, USA
Research director	Promise	Virtual knowledge broker	London, UK
CEO	Sense Worldwide	Virtual knowledge broker	London, UK
CFO	Sense Worldwide	Virtual knowledge broker	London, UK
CEO	Hyve	Virtual knowledge broker	Munich, Germany
Research director	Communispace	Virtual knowledge broker	Boston, USA
VP of business development	Chaordix	Virtual knowledge broker	Calgary, Canada
Project leader	PTC	R&D software provider	Boston, USA
Community manager	PTC	R&D software provider	Boston, USA
Head of social media	PTC	R&D software provider	Boston, USA
Head of consumer goods	Bain & Co.	Consultancy	Munich, Germany
Head of innovation	Bain & Co.	Consultancy	Munich, Germany

Thirdly, the pilot study showed that there were a number of smaller firms, typically focused on one product category, which have innovated with the wider public. They have used these approaches for many years and mainly rely on this approach for their product development. As such, they had a lot of experience in using this approach. Therefore, their approach had evolved significantly and become more refined since they started. Examples of these types of company are Threadless, Local Motors and Quirky.

3.4 Case selection

The pilot study played a significant role in making choices about the selection of case studies. I wanted to understand how community-based innovation contests functioned and the role of firms in making them effective. My sampling aimed to focus on cases where this approach is frequently and extensively used (Yin, 2003). Despite the fact that in many firms community-based innovation contests are used as one of a portfolio of innovation approaches, studying it in a 'pure' setting seemed appropriate to understand the method fully. The strength of insight generated by the use of such cases has been demonstrated prior innovation research, such as the study of the leading product design firm IDEO to explain the dynamics of brokering (Hargadon & Sutton, 1997).

My research question required me to understand multiple elements and perspectives. To answer this question I needed to understand the role of the firm as well as the perspective of contestants and other community members. It required observation of what happens inside the firm and in the community during the contests. As I approached this question inductively, I required broad data collection as well as rich data. Furthermore, within my DPhil project I had to consider both time constraints (completion within three years) and budget constraints. As a result, I decided to investigate two cases in-depth to gain a deep understanding of the firms' work in community-based innovation contests.

In choosing these cases, I followed a replication logic looking for two companies that have extensively and successfully used community-based innovation contests but in different settings (Yin, 2003). This helps in identifying practices in the cross case comparison that are independent of a particular setting. Using this research design, I

secured access to two prominent small to medium-sized firms: Threadless and Local Motors. These two firms were ideal as they had been focus of previous research interest, but only from the outside. This research had focused on the online section, largely ignoring what actually happened inside the firms (Boudreau & Lakhani, 2009; Brabham, 2010; Piller & Walcher, 2006).

3.5 Case backgrounds

In the following I provide a short description of the two firms that served as case studies for this study. I give a comparison of the two firms in table 6.

Threadless

History: Two university students, Jake Nickell and Jacob DeHart, founded Threadless in the year 2000. It emerged from an online community. The founders had been active in a design community online. Jake Nickell participated and won an online T-Shirt design contest in 2000 that took place in the online community dreamless.org to create a shirt for the London New Media Underground Festival. This experience inspired Jake Nickell, together with his friend Jacob DeHart, to start a company that had regular T-Shirt design contests. This became Threadless:

> "Threadless was never intended to be a business. When Jacob DeHart and I started out it was all just a hobby, a fun thing to do for the other designers we were friends with. […] After picking our first winners, we each put in $500. Around $200 was spent on a lawyer to set up a company, and we invested the rest in printing the first batch of tees. […] For the first two years of Threadless, every penny from selling tees went into printing more designs. We didn't even take a salary or cut of sales" (Nickell, 2010a, p.12).

Table 6: Overview of case studies

	Threadless	Local Motors
Background	• Founded in 2000 • Based in Chicago, USA • Sells T-Shirts and other products (water bottles, IPhone cases, etc.) that can be printed on with designs • Several million T-Shirts sold • Revenue USD 30 million (2009)	• Founded in 2008 • Based in Phoenix, USA • Sells the Local Motors Rallyfighter (on- and off-road racing vehicle), 2nd vehicle Local Motors Tandem under development • 50 Rallyfighters sold
Organization	• ~100 employees • Founder & chief community officer: Jake Nickell • Community management team, creative department (for product selection), production department, customer service, IT department, HR & admin team, partnerships and corporate development, warehouse and shipping	• ~40 employees • CEO & founder: John B. (Jay) Rogers • Community management team, contest project team, partnerships and corporate development team, sales team, HR and admin, supply chain, tech department and assembly team
Contests	• Focus of contest: Designs to be printed on Threadless products • Type: On-going open contest and focused topical contests • Examples: Threadless loves dysfunctional families, Threadless loves Minecraft, Threadless loves clever, Threadless loves Disney villains • Entries: ~2000 submissions per week • ~8 thousand new contestants per year (2009)	• Focus of contest: Dependent on contest. Vehicle designs, engineering solutions, car concepts, new automotive system ideas • Type: Focused topical contests • Examples: Boston motors (car concept for Boston), DARPA contest (combat support vehicle), Ultimate Pizza Delivery Vehicle contest • Entries: 40 -150 entries per contest
Firm –hosted community	• Members: Art & design students, Art & design professionals, art enthusiasts, bloggers, customers • Four forum sections – general, art & design, tips & tricks and projects • Community votes on contest entries	• Members: Design students, engineers, automotive enthusiasts • Three forum sections: projects, discussion and contests • Community votes on contest entries
Partners (examples)	• Gap (for contests & retail) • Bed, Bath & Beyond (for retail) • Disney (for contests) • Sony (for contests) • Minecraft (for contests)	• US Department of Defense: DARPA (for contests) • BMW (for contests) • Shell (for contests) • Domino's Pizza (for contests) • Reebok (for contests)

2012 data unless otherwise indicated

Over the first four years, Threadless was a side business for the two founders while they went to university and had day jobs as web developers. They developed a web platform for voting on contest entries. There was little structure in the business. They just ran further contests when they had the money to do so. As the firm grew, they began to employ friends and community members. For many years the company grew entirely by word of mouth. In 2005, they started hiring their first outside professionals (Nickell, 2010b). Revenue in 2004 was US$1.5 million increasing to US$6.5 million in 2005. At that time Threadless selected five winners every week. Throughout this period Threadless supported the online community:

> "Threadless is a community of people first, a T-Shirt store second. Most day-to-day visitors on Threadless are not there to shop. They are there to submit designs, score designs, talk in the forums, read interviews, browse the photo galleries and just generally be inspired by other members in the community" (Nickell, 2010b, p.51).

In 2007 Threadless held their first family reunion at its headquarters. This was a meet-up of community members and other interested parties sponsored by Threadless. Aside from the increasing number of contests, the biggest change during this period of growth was that they could use new printing technologies. This allowed for more colours and more flexibility in terms of the placement of the design on the shirt. This change enabled contestants to get even more creative with their designs.

In the 2009, with sales of $US30 million, significant changes came when venture capital investors came on board. With that and the associated growth came also a more specialised and professional organisational structure. Since then, Threadless has developed a set of partnerships. These are with some charities, but mostly larger established consumer goods firms and retailers. Threadless has supplied designs for these

firms and their products, such as Thermos water bottles, and even developed an exclusive collection based on their contests for the clothing retailer Gap.

Firm structure & organization: Jake Nickell, one of the founders, is still active in the company. As he came from a design background, he did not want to take the CEO role. The CEO and COO are external managers who joined the firm to run the operations and to develop partnerships with established firms like Gap or Disney. Jake has the role of Chief Community Officer. Beyond representing the firm externally, he sees his role as primarily to ensure Threadless business decisions reflect the community's perspective and wishes. Jake also heads the community management team. This team organises events for the community and creates fun challenges that run outside of the contests. For instance, there is an annual family reunion' where all community members are invited to Chicago to a party sponsored by the company. Furthermore, the community team initially screen the entries to make sure that they are in line with the Threadless submission rules, which include not being offensive or breaching copyrights. They also manage the process of dealing with the winners of contests and paying out prizes once a design has been selected. Beyond these specialised roles, Threadless has all the typical functions that are typically found in an online retailer. Most of its one-hundred people worked in shipping, production management, IT and customer services. The key difference between Threadless and traditional clothing firms is that all the designs that are printed come from the community, via regular contests. The limited number of internal employees in their

creative department focused on selecting new products (such as iPhone cases or water bottles, internally called ‘canvasses’) that community members could create designs for.

Innovation contests & community: Threadless provides an online platform and tools to enable members of the community to interact as well as prepare their contest entries. The platform is made up of one forum area that is used for most of the community activities and a contest part on which the community members can vote on the submitted contest entries.

The contests and community are open to anybody who wants to participate regardless of home country, skill level or background. Most contestants fall into one of three categories: design and arts students, professionals in design related jobs and other professionals who have a passion for art and drawing. A large share of the contestants are active in the community, but beyond these there are also bloggers and people that just like to vote and look at the designs without ever submitting. Some of these people are customers, some are not. The community discusses all types of design related issues, but shows an interest in other areas too. Members talk about sport, music and their life in general. Threadless employees participate. They have a logo next to their community avatar showing that they work for Threadless. Since its beginning, two million people have registered to be part of the Threadless community.

Threadless runs two type of contests. It runs an on-going contest to which anybody can submit designs that they believe would look good on a shirt. In addition,

there are topical contests, “Threadless loves challenges”, which ask for designs on a specific topic. These are often used for collaborations with partners like Disney. Contestants submit their designs on a mock-up shirt as well as in a format that minimises the subsequent effort needed to print the design on a shirt. At the time of my study, Threadless community members could vote on more than 1000 designs every week submitted by community members, with five new T-Shirt designs printed each week. The number of submissions is higher, but half of them are not admitted to the contests, as people submit the wrong file format, or the designs are offensive or breach other firm’s copyrights. Those that are rejected in the pre-screening by the firm receive detailed feedback as to why they are ineligible and how their design can be improved. Threadless has continuously received more than a five hundred submissions every week for more than five years. Several hundred members vote on each design and community members typically receive 10 to 20 comments by other community members on their design. Based on the votes of the community, the company votes on the highest scoring designs and a small team from the creative department selects the winners based on the internal Threadless votes. All employees from reception to IT are encouraged to participate in the voting process. Contestants receive $2000 initially and $500 for every reprint of their winning designs. With their first win, contestants become members of the alumni club, which gains them a badge in the community. This shows everybody that they have won and gives them access to an exclusive part of the community, the alumni forum, that only winners can access.

Table 7: Overview of submissions of a sample of contestants

Number of submissions	Number of contestants (% of total contestants)	Number of submission (% of total submissions)	Number of contestants that won at least once
One	4,435 (53%)	4,435 (16%)	9 (7%)
Two to five	2,977 (36%)	8,285 (30%)	16 (13%)
Six to ten	512 (6%)	3,790 (14%)	14 (12%)
More than ten	395 (5%)	11,433 (41%)	82 (68%)

Notes:
Based on Threadless members who joined in 2009 and who made at least one design submissions
Data represents activity from 2009-2012

As shown in Table 7, the majority of contestants only compete once. A lot of people try out Threadless and realise that it is not for them. Yet this group also makes relatively few winning designs. Most of the winners come from the five percent of contestants that submit more than ten times. This shows it takes time to win a contest at Threadless. In spite of being small in percentage, this group of contestants makes by far the largest contribution in terms of number of submissions. Contestants typically submit a design every couple of weeks or months. Having 11% of contestants that submit more than five designs shows that Threadless is able to engage them and to motivate them to come back to their site repeatedly and make contributions. At the same time, participating on Threadless is a phase of life. So after a number of years, these contestants move on and are replaced by a new generation of contestants.

Local Motors

History: Founder and CEO Jay Rogers developed the idea for Local Motors when he was an MBA student at Harvard Business School. Based on his experience as a US marine in Afghanistan, he wanted to develop a vehicle that could be built by a small team and serviced by the owner. He wanted to advance the development process in the

automotive industry by adopting a co-creation approach. In 2007, he founded Local Motors and his team started to approach car designers and enthusiasts who were active on the internet to come and join the online community they were building. The main attraction that Local Motors had at that point was the promise to actually build the car. Many other only design focused sites did not do this. Over the subsequent years, Local Motors ran a number of contests for car concepts and designs. Each of the contests focused on designing a car for a different region. In 2009 Local Motors decided to build the design and concept of a young Korean car designer named Sangho Kim. It was for an off-road desert racing vehicle named the Rallyfighter. The design was complemented by further contests for the interior design and car components that Local Motors needed. The first prototype was finished in 2010 and the first cars sold in 2011. Local Motors, has over the years, partnered with other firms in the automotive sector and beyond. For instance, it reached an agreement with Siemens in 2011 to provide CAD software significantly below market prices to its community to enable online collaboration. Local Motors has run other innovation contests for the US Department of Defense, Domino's Pizza, Shell, US truck manufacturer Peterbilt and BMW.

The initial focus of Local Motors contests and its community was mainly on car designers. In 2011, it widened its focus to include engineers and anybody interested in building, repairing or just looking at vehicles. It has also moved beyond cars to also focus on other vehicles like bikes and trucks. This expansion in focus saw changes in the community and contest platform. At the end of 2011, Local Motors launched a new platform, which included additional functionality particularly targeted at engineers. This site is called the Local Forge.

In 2012, Local Motors started the development of its second car. Based on the idea of a community member they are developing a low cost tandem car. They are doing this through using a combination of contests and community collaborations.

Firm structure & organization: Local Motors has the same basic structure as other car manufacturers, including a large production team running Rallyfighter production, a sales team, and a development team. The development team does the detailed engineering work that the community cannot do. For instance, integrating parts across the whole vehicle. The difference to other automotive firms is that the development team actively explores which activities could be given to the community. Furthermore, even the work that the development team does away from contests and community is subsequently shared with the community through blog posts, live streams or videos.

Local Motors employs designers, but it lacks a design department for creating new vehicles. Design is always done through contests in the community. Local Motors also has a 'community management team'. The team consists of former community members who are now working at the Local Motors micro factory. The team manages daily interactions with community members, dealing with their questions and concerns, and often even providing technical advice. They also write up the contest briefs which set out what the company is looking for and manage the contest process. They provide advice for screening entries and manage the voting and selection process. In 2012 Local Motors had roughly 40 employees.

Innovation contests & community: The Local Forge is Local Motors platform for all contests and community activities. Contests at Local Motors are less frequent than at Threadless and are always focused on a particular topic. While initially the contests concerned car concepts and designs, Local Motors now also has engineering-focused contests, such as developing a rear view mirror mount. Furthermore, there have been contests that have purely focused on ideas for new car systems. For instance, they ran a future of automotive contest for BMW. As such, Local Motors has opened its community to anybody that is interested in cars. Contests typically have an elaborate contest brief which sets out the requirements of Local Motors or their respective partner. The contests last several weeks, after which all entries are screened by their community management team. Entries that do not fulfil the requirements are typically given a grace period in which they can be changed. Then all the entries go up for voting by the community. Based on the community scores, Local Motor, or Local Motors jointly with a partner, select the winners. The contests are open to anybody. The contestants that compete are typically interested in engineering or design, some of them are professionals in these areas, some are students and others enthusiasts who are simply interested in these topics.

In between the contests, and in parallel, contestants and other enthusiasts interact in the community. The community provides them with the opportunity to upload and discuss their own vehicle projects. This helps them to get feedback and support for their work with their own cars or get help with new ideas they are exploring or techniques they are learning. By 2012, more than 15,000 people were registered as part of the Local Motors online community.

3.6 Data collection

I collected multiple forms of data in order to understand how the firms work with their online communities and run their innovation contests. Firm employees, the firms' leadership as well as community members and contestants were interviewed. This was necessary to understand both the firm as well as the community and contestants' perspective, particularly with regards to certain activities that the firms carry out for the community and the contestants.

Table 8: Data collection for DPhil thesis

	Threadless	**Local Motors**
Onsite period	HQ Threadless, Chicago, USA 23. August - 15. September 2011 21. September - 22.October 2011 14. April - 12. May 2012 *Total: 12 weeks at Threadless*	HQ Local Motors, Phoenix, USA: 24. November - 16. December 2011 10. January - 7 April 2012 *Total: 16 weeks at Local Motors*
Interviews	30 with employees & top management 35 with community members	20 with employees & top management 12 with community members
Example observational data	Employee town hall meetings Community team meetings Community feedback session Annual Threadless "family reunion" Comic Convention New York	Weekly stand up meetings Community website meeting LM labs meetings Team leader & strategy meeting 4M community events
Example documents/ online data	Community dashboard International community analyses Internal voting website New website concept Staff blogs Threadless alumni forum Threadless community forums Threadless contest site	Community status presentation Strategy review presentation Venture capital presentation New community concept Staff blogs Local Motors community forums Local Motors contest site Local Motors tiny chats

To understand the firm practices better and to identify practices that had become so embedded in the firms that employees did not mention them, I supplemented the interviews with observational data. Furthermore, I also collected internal documents, the

on-going online discussions in the community, blog entries, as well as the interactions of contestants during contests. All these data sources allowed for the triangulation of my findings.

Table 9: Interviewee examples from firm and community side

	Threadless	**Local Motors**
Top management	Founder /Chief Community Officer (F) Chief Executive Officer (F) Chief Operating Officer (F) Chief Marketing Officer (F)	Founder /Chief Executive Officer (F) Chief Information Tech Officer (F) Head of Corporate Development (F)
Community management team	Community Director (F) Community Manager (F) Artist Liaison Manager (F) Community Broadcaster (F)	PR & Community Manager (F) Design Community Manager (F) Engineering Community Manager (F) Engineering Community Liaison (F)
Employees with community related jobs	Creative Director (F) Community Copywriter (F) Community Website Developer (F) Multimedia Specialist (F)	Community Website Developer 1 (F) Community Website Developer 2 (F) Head of Engineering (F)
Other firm employees as community members	Warehouse Director (F) Marketing Designer (F) International Marketing Manager (F) Quality Control Manager (F)	In-house Designer (F) Head of Sub-Assembly (F) Engineering Intern 1 (F) Engineering Intern 2 (F)
Community members & contestants	Full-time Threadless member, Asia (S) Personal trainer, Europe (S) Advertising designer, Australia (S) Arts student, US (S) Quality control manager, US (F) Nurse, US (P)	Industrial designer, Asia (S) Telecom engineer, Europe (S) Transportation design student, US (S) Store manager, US (P) High school student, US (P) Pastor, US (P)

F- face to face interview; S – Skype interview; P – phone interview

Table 8 provides an overview of the data collected. I spent three to four months on site at each firm between August 2011 and May 2012. Some impressions of both cases are shown in Exhibit 1 and 2. During this period I was able to observe the activities of all the employees who were involved in contests and interacted with the community on a

regular basis. Furthermore, I had the opportunity to observe key meetings of employees and top management concerning the contests and communities.

At both firms I was able to interview all the employees who were integral to the contests and the community, as well as everyone in the top management teams. These interviews were complemented by numerous informal conversations with employees and top management. All these interviews were done in person (table 9).

In addition, I interviewed contestants as well as some other community members who chose not to compete. The majority were active contestants. I chose contestants with varying levels of community participation, as well as experience and success in contests. Some of the contestants had not won and recently joined. Some had recently won and some had won multiple times and were long-standing members. The majority of these interviews were done by Skype or telephone (table 9). The interviews were supplemented by following the community conversations on the forums and in the contests. In total 97 interviews were conducted. All of the interviews were recorded and transcribed. This resulted in 1400 pages of interview transcripts.

Exhibit 1: Fieldwork impressions Threadless

Threadless headquarters, Chicago



Band playing at Threadless warehouse with live broadcast to the community



Threadless atrium with company slogan



Exhibit 2: Fieldwork impressions Local Motors

Local Motors factory floor



Local Motors atrium with hall of fame of previous contest winners



Local Motors Rallyfighter in front of the factory



In addition to this qualitative data, I also collected quantitative data on the contest and community participation of Threadless members. Data about the different Threadless community members was available in their online profiles on the Threadless webpage. This data included when a member joined, how often they submitted and voted and how often they initiated blog posts in the community. The data collection took place in December 2012 and January 2013. I set up a webcrawling query and looked at all those individuals who created a user profile on Threadless in 2009 in order to have a sufficiently long time period for observation. In total 277,480 user profiles were created this year. The high number is explained by the fact that every new customer also creates a new user profile. I analysed these profiles to identify the users that became active contestants by submitting one or more designs to Threadless. I identified 8319 users that submitted to Threadless who joined in 2009. For all these members I collected the data regarding when they joined, how often they submitted, voted and created blog posts, as well as whether they won a Threadless innovation contest. Furthermore I collected the scores of all the submissions that these members had running in the Threadless contests between the time when they joined until October 2012. This came to 27943 entries.

3.7 Data analysis

The data analysis was slightly different for each of the empirical chapters. As such, the details of the analysis can be found in these chapters. In each case, the analysis followed an iterative approach, taking place in between the phases of fieldwork and thereby helped in sharpening the focus of my data collection.

The empirical chapters that follow represent the three most important concepts that emerged from my inductive analysis of how firms engage online communities to participate in contest on an on-going basis. Overall three core concepts emerged from the fieldwork. These were repeatedly mentioned by firm employees and contestants alike and were shown and discussed in the community and contests. They were the opportunities for learning and skill improvement for contestants, external community members feeling part of the firm and the perception that creating contest entries was recreation. Each of these themes was analysed individually to understand the underlying mechanisms.

For each theme, data was analysed using NVivo 9 (Bazeley, 2007). Initially I completed an open coding of the data (Saldaña, 2009). This analysis was completed as a within case analysis separately for both of the cases (Eisenhardt, 1989). The coding identified themes that were relevant for the concept. In a second round, these open codes were combined into constructs (Miles & Huberman, 1984). This was followed by a cross-case comparison between Threadless and Local Motors. Each of the concepts is based on triangulation of multiple data sources. In order to further validate the results, I actively looked for alternative explanations. Most importantly, for each of the chapters the results were checked with key informants from both cases.

Chapter 4: Open innovation where "everyone's a winner": Experiential learning in community-based innovation contests

"I am not considering Local Motors as a way to get payments for competitions, prizes, and stuff like that. I am using it as a portal to learn."

(Local Motors contestant during interview)

4.1 Introduction

In pursuing an open innovation strategy focused on sourcing ideas into the organisation, firms are able to choose from a variety of partners. Firms have pursued innovation with organisational partners, such as suppliers or universities, as one means to acknowledge that "[a]t root, the logic of Open Innovation is based on a landscape of abundant knowledge" (Chesbrough, 2003, p. xxv) and that firms themselves do not hold a monopoly on good ideas. While organisations have long collaborated with outsiders (Allen, 1983; Nuvolari, 2004), the development of a range of online tools has allowed firms to connect increasingly with large numbers of individuals as providers of ideas (Nambisan, 2002). In doing so, firms have often been presented with two main choices on how to engage with individuals: they can either run a competitive innovation contest or host a collaborative online community (Boudreau & Lakhani, 2009).

Innovation contests involve soliciting ideas from a wide range of contributors who compete for a prize reward (Afuah & Tucci, 2012; Jeppesen & Lakhani, 2010). Online idea platforms such as Innocentive host contests on behalf of firms to generate solutions for specific challenges. Firms provide a problem, set a prize amount, seek entries, and subsequently select the appropriate idea or solutions (Ebner, Leimeister, & Krcmar, 2009). Typically there are only a small number of talented contestants capable of making valuable contributions to the firm. What is more, the inclusion of weaker contestants can decrease the effort of the other contestants if they perceive that they have a lower chance of winning (Terwiesch & Xu, 2008). Increased participation also increases the workload for the firm. Some solutions to this quandary include charging contestants an entry fee (Fullerton & McAfee, 1999) so that the contest only attracts higher skilled contestants. In

summary, a central issue in designing innovation contests is how to source a broad range of high quality contestants and then screen their ideas efficiently.

In contrast, online communities focus on collaboration and building cumulative knowledge among individuals (O'Mahony, 2003; West & Lakhani, 2008). Following Rheingold's (1993) original definition, such online communities function as "social aggregations that emerge…when enough people carry on public discussions long enough, with sufficient human feeling, to form webs of personal relationship in cyberspace" (p.5). Firm-hosted communities include examples of those developing computer-based musical instruments (Jeppesen & Frederiksen, 2006) or 3D printing technology (Raasch et al., 2009). Collaboration and learning are central to communities which focus on innovation (Nambisan & Baron, 2009; O'Mahony & Ferraro, 2007).

The competitive approach of innovation contests and the collaborative approach of firm-hosted communities typically rest on very different dynamics. Despite this apparent contrast, some firms have pursued a hybrid approach to open innovation by establishing "community-based innovation contests" to source ideas. In this form of open innovation, individuals compete to provide winning ideas for a firm, but they can also interact within a firm-hosted online community. In this hybrid model, one could expect that competition might override both collaboration and learning. My research objective was to examine if this form of innovation contest exhibited community-based learning among contestants and, if so, the processes through which learning is supported.

I addressed the research question by drawing from a study of two firms: Chicago-based T-Shirt firm Threadless and Phoenix-based automotive firm Local Motors. Both firms run regular innovation contests in which members of firm-hosted online

communities compete to provide ideas for new products. I use both qualitative and quantitative data. Analysing the performance of one cohort of over 8,000 contestants at Threadless, I show how initially weak contestants become more skilled with contest experience. Using a subset of data for event history analysis, I further show how the more active a contestant is in the community, the more quickly they are likely to learn. Through over 90 interviews, field visits, and archival research, I show how the contest and community work together to create a context of experiential learning for contestants. As such, I bring a more socialised approach to studies of innovation contests.

In this study I have responded to calls for more detail on open innovation approaches (West & Bogers, 2011), for more research on how firms may draw from community forms of organising (O'Mahony & Lakhani, 2011), and for addressing a long-standing challenge to consider how a multiplicity of innovation models may each have value for firms (Chesbrough 2003, p. 194). I will describe under what conditions this hybrid form of "community-based innovation contests" may be appropriate as part of a firm's portfolio of open innovation strategies. In this form of innovation contest, my research demonstrates that firms do not have to screen out weaker contestants, as many initially weak contestants will improve through experiential learning. Competition and community, rather than being antithetical, can reinforce one another, meaning that potentially "everyone's a winner" through skill development and through benefits to both contestants and firms

4.2 Literature review

In the next sections, I first review studies of the use of innovation contests as a form of open innovation, with an emphasis on sourcing ideas from highly skilled contestants. I then review innovation communities as an alternative approach that focuses on collaboration and learning. Finally, I briefly describe the hybrid model of community-based innovation contests, before describing my methods and research sites.

Open innovation using innovation contests

The use of an innovation contest, tournament, or prize has a long history in innovation studies (Davis & Davis, 2004; Fullerton & McAfee, 1999). In making use of innovation contests, a firm defines an area for which it needs ideas, sets out a prize, and runs a contest to solicit contributions (Afuah & Tucci, 2012; Howe, 2008). Firms may either host such contests themselves or make use of a third-party provider (Verona et al., 2006). Such contests are typically open to any contestant who wishes to take part. Typically there is, at most, limited exchange between contestants (Boudreau & Lakhani, 2009), as keeping participants independent can help to promote divergent ideas that are often the focus of such search. One of the advantages of innovation contests is their reach, as they can tap into a knowledge domain otherwise unknown to the firm (Afuah & Tucci, 2012). Often the most valuable ideas come from contributors that are from distant areas of expertise or from typically marginalised contributors (Jeppesen & Lakhani, 2010). Innovation contests have also been used by firms to create a variety of ideas in a well-defined domain, such as in the new design of a specific product (Howe, 2008; Poetz &

Schreier, 2012). Innovation contests have the potential to provide innovative ideas that are superior in terms of novelty and benefit compared to what a firm could develop internally (Poetz & Schreier, 2012).

Nevertheless, firms face challenges when running innovation contests. A first challenge is the potential of decreased involvement with increased participation. It is in the firm's interest to get a high number of entries, making it more likely that the company will find a successful idea (Terwiesch & Xu, 2008). However, there is typically a trade-off between effort of contestants and the number of people competing (Davis & Davis, 2004; Jeppesen & Lakhani, 2010; Terwiesch & Xu, 2008). Individual motivation to participate in innovation contests may be driven by monetary payments, and so the higher the number of contestants the lower the effort level expected of those who participate, as their expected return decreases (Jeppesen & Lakhani, 2010; Terwiesch & Xu, 2008). Relatedly, investments to compete are typically sunk costs (Che & Gale, 2003) and so can reduce a contestant's expected effort over time (Taylor, 1995). A solution could be to reduce the number of contestants (Fullerton & McAfee, 1999) to keep individual incentives high and reduce screening costs for the firm. Indeed, the optimal number of contestants could be argued to be two (Che & Gale, 2003), as this creates competition but also keeps individual chances of winning highest (Terwiesch & Xu, 2008). However, most open innovation approaches rely on a diversity of ideas that require higher numbers of contestants (Terwiesch & Xu, 2008).

Given the need for many contestants alongside the costs of screening poor quality ideas, a second challenge is how to take into account the varied skills of contestants. While some research has assumed that contestants have relatively homogenous skills

(Schöttner, 2008), most research now focuses on how to deal with a heterogeneous field of contestants and how to gain efficiencies in sourcing and screening ideas. For example, "first-price auctions," in which contestants bid a price for their ideas, offer a potential alternative to traditional fixed-prize tournaments (Che & Gale, 2003; Fullerton et al., 2002). This model can help contestants with low quality innovations compete for a lower prize and help the firm from over-paying (Schöttner, 2008). Another alternative to fixed-prize tournaments is are performance-contingent prizes (Terwiesch & Xu, 2008). This method may increase the effort of contestants in seeking higher prize amounts. However, there are distinct challenges in determining the appropriate amounts.

The way a firm deals with contestants of varying skill levels is a central design element for innovation contests (Morgan & Wang, 2010). Some studies demonstrate that high-level contestants make other contestants perform less well in some contexts (Boudreau et al., 2012). Firms could try to restrict entry to only those of certain proven skills. A simple option to achieve this is by charging an entry fee that deters those whose expected profit from entering is low (Fullerton & McAfee, 1999). The difficulty with entry fees is setting the right level to attract enough, but not too many contestants. In addition, attracting individuals from groups whose skills may not be readily apparent can be advantageous for sourcing new ideas (Jeppesen & Lakhani, 2010).

Overall, much research on innovation contests would point to advantages of attracting a focused field of highly-skilled contestants. As such, the main design task is how to attract contestants of this sort and efficiently screen their contributions. An alternative open innovation approach looks not at screening idea providers in advance, but at how ideas and related skills may be developed within communities.

Learning in collaborative innovation communities

Although there is limited knowledge of learning within innovation contests, the role of communities in skill development has a long history of research, whether in off-line community-of-practice studies (Lave & Wenger, 1990; Brown & Duguid, 1991) or in online contexts devoted to innovation (Jeppesen & Frederiksen, 2006). In the online context, firm-hosted online communities can include forums in which members exchange knowledge and learn from each other how to use, modify, or extend a firm's products (Jeppesen & Frederiksen, 2006). User communities have been shown to innovate in a variety of areas ranging from sports equipment to automotive products (Baldwin et al., 2006; Franke & Shah, 2003; Raasch et al., 2009). Participants in these communities share knowledge and build on each other's work (Wiertz & de Ruyter, 2007).

As an example in an offline community, Baldwin and colleagues (2006) demonstrated the ability of communities to create knowledge for the dominant design of a new rodeo kayak. Different users explored and jointly optimised designs while building on each other's inventions within the community. This observation shows the strength of innovation communities in collectively recombining knowledge and promoting learning (Kogut & Zander, 1992).

Other forms of innovation communities are open-source software communities, where globally-dispersed programmers invest their time into coding software products, and, upon completion, the product is made freely available to all (Von Hippel & von Krogh, 2003; West & O'Mahony, 2008). A key motivator for contributors to give their time freely to these communities is the private benefits they receive (Von Hippel & von Krogh, 2003). One of the main private benefits and motivators for community members is

the learning and improvement in programming skills they gain through participation. Previous research has suggested that individuals gain a large increase in skills through participation in open source communities (von Krogh et al., 2003). Members provide critiques and corrections to other programmers, which not only help to improve collective innovation, but also lead to individual skill improvement (Von Hippel & von Krogh, 2003).

Further research in open source communities has highlighted that the learning in open source is, to a large extent, experiential (Hemetsberger & Reinhardt, 2006). In experiential learning, individuals generate learning based on interactions with the environment (Kolb & Fry, 1975). Open source communities provide several ways of learning from experience. Through generating code, programmers gain direct experience. As code is openly available, community members can read the code and associated comments, enabling members to learn from others. Similarly, log-files provide general knowledge that is applicable in a variety of settings (Hemetsberger & Reinhardt, 2006). Communication with those who share similar experiences facilitates experiential learning (Kolb & Kolb, 2005), a phenomenon which is easier in online environments. Simple online environments are more successful for experiential learning than complex communication platforms (Alavi, Marakas, & Youngjin, 2002). Previous research in this area highlights the importance of an appropriate environment for experiential learning that needs to be rich in experiences, but also provides the capacity for reflection and analysis. Overall previous research has shown that communities are well-suited for knowledge creation, skill development and learning.

A hybrid model: Open innovation using community-based innovation contests

In recent years, firms have increasingly adopted a new approach to involving the wider public in open innovation by using community-based innovation contests (Bullinger et al., 2010; Hutter et al., 2011). Firms run innovation contests, but rather than drawing from unconnected contestants, they invest in creating a community in which contestants can exchange knowledge and may even choose to collaborate on contest entries. The contest still remains the central means for obtaining product ideas though.

There are three ways in which communities for these contests differ from other firm-hosted user communities that research has studied. First, the community focuses on creating products for firms. In contrast, user communities are marked by the fact that users innovate because they have an unsatisfied need. They create an idea for modifying a product to satisfy their need and their ideas are then opportunistically picked-up by the firm (Jeppesen & Frederiksen, 2006). Secondly, the contestants in the community often do not fulfil lead user characteristics (Von Hippel, 1986). Most of them innovate because they enjoy the process of creating and making. Lastly, the final product is attributed to an individual rather than to the community. This is in contrast to open source and user communities, where the result is a collective innovation (O'Mahony & Ferraro, 2007).

The hybrid model of a community-based innovation contest provides an opportunity to combine competition with collective learning. Given the apparent difference between competition and collaboration, I set out to examine if this form of innovation contest exhibited learning among contestants and, if so, the process by which learning is supported.

4.3 Research method

For this chapter I chose to use a quantitative method, growth curve analysis, in addition to the qualitative case study analysis. In combining the growth curve analysis and a qualitative case study approach, my research follows earlier studies on online communities that have combined qualitative and quantitative methods (Dahlander & Frederiksen, 2012; O'Mahony & Ferraro, 2007). As in these studies the quantitative analysis is a confirmation of qualitatively inducted findings and helps in understanding the effect in the outcome variable which in my case is the contest performance of participants. My inductive work showed that the core function of the community for contestants is the development of their skills. Contestants suggested that to fully benefit from these learning opportunities participating in the community was important. Consequently, I decided to structure my results in two sections going from the broad perspective that looks at all types of contestants in the quantitative analysis to a subset contestants that heavily participate in the community in the qualitative analysis.

The quantitative analysis looks at all contestants regardless of community participation i.e. those contestants that do not participate or only little and those that intensively participate in the community. The multilevel analysis using growth curves helps to highlight the learning differences between contestants with different levels of community participation. It thereby sets the stage for the focus of the qualitative analysis.

The qualitative findings focus on the core members that are active in the community and have significantly higher learning. The qualitative findings show how the community helps contestants develop their skills through experiential learning. These learning processes are only experienced by contestants that participate in the community.

For instance, only if you are an active member that is known to other members, will more experienced and successful contestants take on a mentoring role. As I show in chapter 5, these core community members are also those that are most valuable to the firm in number and quality of contributions. Thus, the qualitative analysis helps to explain the difference in learning identified in the quantitative analysis.

Research setting

Threadless was founded in 2000 as a T-shirt company that printed designs exclusively drawn from contests they ran within a firm-hosted online community. By 2012 over one thousand designers competed each week to have their contribution chosen as one of five designs selected by the firm as part of the weekly contest. T-shirt designs were first voted upon by the community and then selected through the firm's internal process. At the time of my study, winners received $2000 initially and $500 for every reprint of their design. Since being founded, two million people had registered as part of the Threadless community. Apart from running design contests, Threadless resembled a traditional online clothing retailer in many ways. Most of its employees worked in shipping, IT, production or customer service. The main difference was that the creative department focused not on designs themselves but on selecting designs from contests, interacting with the community, and identifying new markets.

Local Motors was founded in 2007 with the vision to develop the first "open-source car." At the time of the study, Local Motors had run numerous contests for potential car designs. Local Motors developed an online community in which contestants

and other car enthusiasts could exchange ideas and submit designs as part of regular contests. By 2012, more than 15,000 people were registered as part of the Local Motors online community. The prototype of the first car, the Rallyfighter, was completed after a period of two years. In addition to the Rallyfighter, Local Motors had run other innovation contests, including for the US Department of Defense, Shell, and Peterbilt.

Local Motors had the same departments as traditional car manufacturers, including a production team for Rallyfighter production, a sales team, and a development team. In 2011 the firm consisted of approximately thirty employees. The development team did the detailed engineering work that was required following a contest, such as the integration of parts across the overall vehicle.

In each of my settings, the firm provided an online platform to enable members of a community to interact as well as to prepare contest entries. Both Local Motors and Threadless had “community management” teams within their organisations. They used the online community for presenting potential contest entries, sharing ideas, receiving feedback, discussing techniques, and it also served as a social place to discuss a range of topics and even to establish friendships that later extended to the offline world. The level of community involvement of contestants varied: some merely signed-up and submitted ideas, while others were deeply involved in the forums and discussion sections of the online communities. Community members could vote on submissions made by others and also provide written feedback on designs. In both cases, the firm made the decision as to what to produce, weighing not only community votes but also factors such as product variety or past sales.

Despite the fact that contestants would win prize money if selected, contestants did not completely give up ownership of their ideas. Both Threadless and Local Motors labelled the products with the names of individual contributors. For instance, each Rallyfighter is delivered with a metal badge with the signature of Sangho Kim, the winning contestant. Furthermore, Local Motors left the design data of the Rallyfighter in the public domain governed by the Creative Commons License. Threadless only takes the right to print the members' design on a T-Shirt in exchange for the prize money, but leaves the rights for all other uses with the contributors.

Qualitative data collection and analysis

The collection and analysis of my data proceeded in four phases. In the first phase of analysis, multiple sources of data were collected, consistent with advice to work across data sources (Maylor & Blackmon, 2005). I spent over three months at each of the companies, observing key meetings and learning about how they ran contests and the role of communities. Over 90 semi-structured interviews were conducted, each lasting between 30 minutes and two hours. All interviews were transcribed, resulting in approximately 1,400 pages of text. Two interview protocols were developed, one for employees and one for community members, each of which was revised after the first phase of analysis (Foddy, 1993).

All firm-based interviews were conducted face-to-face. The focus of the interviews was on the benefits and challenges of the community as part of the firm's innovation contests. Interviews with community members were mainly performed by

phone or videoconference (Skype). I interviewed members at all stages and levels of involvement, including members who had joined recently, those who had won one contest, and those who had repeated successes. The focus in these interviews was on their experience with the innovation contests, their view of how the firm worked, and their motivation for participating in contests and contributing to the community. I focused on the current activity of the community and the firm rather than distant historical events.

The fieldwork and analysis followed an iterative approach between the field and data analysis. Initially I spent one-to-two months with each firm, followed by a preliminary analysis phase. This was followed by a second phase in the field that lasted between 1.5 and 2.5 months.

During this second phase, more focused interviews and observation based on the emerging constructs from the first wave of analysis were completed. After this further data collection, data was analysed using NVivo 9 (Bazeley, 2007). Initially I completed an open coding of the data (Saldaña, 2009). This analysis was completed as a within case analysis separately for both of the cases (Eisenhardt, 1989). The coding focused mainly on descriptions of community activity and the resulting effects these activities had for both contestants and for the quality of their entries. During this second phase I developed an understanding of the functions of the community in innovation contests. In both cases, the function that emerged very strongly from the data was learning and improvement of the skills of contestants through the community. Therefore, this focus on individual learning among contestants became the central theme.

Analysis of contestant learning

In the third phase of data analysis, I re-analysed my qualitative data in light of the inducted focus on learning. From the basis of my prior open coding, I developed constructs for different forms of experiential learning for the contests (Miles & Huberman, 1984). This was followed by a cross-case comparison of learning activities between Threadless and Local Motors. I found common learning processes for contestants across the two contexts. I further discovered that the learning processes followed an experiential framework. Experiential learning theory had not been part of my original focus, and so this was something I researched to understand further patterns in my inducted findings.

Kolb developed the most influential form of experiential learning theory (Kayes, 2002). More than one thousand studies have been conducted based on this theory since the 1970s (Kayes, 2002), which have covered many different areas, including education and law. Management theory possesses the second largest body of research that uses experiential learning theory (Kolb, Boyatzis, & Mainemelis, 2001). The core idea of experiential learning is that a key source of knowledge is one's own experience (Kolb, 1984; 1992). Experiential learning occurs across four stages of learning. In the results section, I will describe how the design of community-based innovation contests led to experiential learning among contestants.

Quantitative data collection and analysis

In an fourth and final stage of analysis, I realised I had the opportunity to collect quantitative data related to learning that I could use in conjunction with my qualitative data. The design of the Threadless online community platform allowed me to test whether contestants learned with experience, as well as whether participation in the community had an effect on improving contest performance, as data about community members was available in online profiles. This data included when a member joined, how often the member submitted to contests, how often the member voted on other designs, and how often the member initiated blog posts in the community.

This final phase of data collection and analysis took place in December 2012 and January 2013. I identified the 8,319 contestants who had joined the Threadless community in 2009 and had subsequently entered a design contest in the 2009-2012 timeframe. I chose the start date of 2009 in order to have a long enough period to observe the development of contestants. For all these contestants, I collected data on: date of membership; how often they submitted, voted and created blog posts; and whether they had won a contest. Furthermore, I collected the rating scores of all the submissions. Among the 8,319 contestants there were a total of 27,943 contest submissions.

For each contestant I had their entire score history. Contestants typically made their first submission very soon after joining, often before they became significantly involved in the community. As such, I used the first score as a proxy of the skill level with which the contestants joined Threadless. Consequently, with the initial score as a starting point, I analysed how skills of new Threadless contestants were distributed and how many contestants from each skill class subsequently won a contest.

I also created a measure of community participation. For this I chose the number of blog posts that were created by contestants. Blog posts in the community can include topics such as asking for feedback, starting a general discussion, or presenting a final submission. Contestants that created many blog posts were typically part of the core conversations in the community when compared with less active peripheral members. I looked at the distribution of blog posts per member for my entire sample and grouped contestants into quartiles based on their blog initiation level.

To measure learning, I created a panel data set containing the first ten scores for contestants who had at least this many submissions. As I was interested in potential learning among initially less skilled contestants, I included only those with an initial score of less than 2.5, leaving a data set for this part of the analysis of 411 contestants. I analysed the learning of these contestants by comparing those at the top and bottom quartile in community participation, 205 contestants in total, allowing us a clearer understanding of the effects that community participation has on learning.

I used growth models which are commonly deployed in educational research to measure learning (e.g. Brooks & Meltzoff, 2008; Crijnen, Feehan, & Kellam, 1998). These allow us to model not only the average pattern of change but also inter-individual variations in the rate of change as learning (Shaw & Liang, 2012). The model takes into account that observations within one individual are not independent. The outcome parameters in the fixed part are the mean intercept across the sample as well as the mean slope, which is the within-person rate of learning (Shaw & Liang, 2012). The random part consists of an individual-level intercept and a random effect for time, they “represent the between-person variability in intercept and slope” (Shaw & Liang, 2012, p. 219-220).

A likelihood ratio test was conducted to see if the two groups start on the same level or not. The latter significantly improved the model's fit and was therefore chosen. In my model, the fixed part consists of a linear term for submissions. To better illustrate learning, I used a dummy for each time point that will be plotted in figure 3. Both times, the submission variables were interacted with level of community participation to see if the learning differed significantly between the two groups.

4.4 Results: Learning in community-based innovation contests

The results of my research are presented in three sections. In the first section I show the results of my panel data analysis of learning in innovation contests. In the second section I will demonstrate how the contest and community complement each other in providing learning experiences. In the final section I illustrate how learning adds value for the firm beyond skill development of contestants.

Learning and community participation

My first objective was to determine if contestants learn with experience while participating in community-based innovation contests. To address this issue I use the results of my panel analysis. With my cohort of Threadless contestants, I find that a majority did not perform well in their first innovation contest. As Table 10 illustrates, only about 5% of contestants achieved a score of at least 2.5 (the lower boundary of a good score according to interviews with firm members) in their first contest on Threadless.

Table 10: Distribution of initial skills and subsequent success in an innovation contest

Score in members' first Threadless contest	Number of such members	Number of members who won a design contest
below 1	46 (0.6%)	0 (0.0%)
1 - 1.49	1552 (18.7%)	4 (3.3%)
1.5-1.99	4014 (48.3%)	29 (24.0%)
2 - 2.49	2258 (27.1%)	50 (41.3%)
2.5 and above	449 (5.4%)	38 (31.4%)
Totals	*8319 (100.0%)*	*121 (100.0%)*

Notes:
Based on Threadless members who joined in 2009 and who made at least one design submission
Data represents activity from 2009-2012

This suggests that the vast majority of initial contestants do not have the skills to be of value to the firm's contests and that contestants are initially highly heterogeneous in skill. However, as further illustrated in the column reflecting the number of members who won a design contest within the 2009-2012 timeframe, even those with initially low scores may later become valuable contributors. More than two thirds of the contestants who eventually won an innovation contest had initial scores below 2.5, and more than a quarter of the winners had initial scores of less than 2.

These results support a thesis that contestants can significantly develop their skills through? experience. To investigate this trend further, I calculated growth curves of learning for contestants based on my panel data. I divided contestants into quartiles based on their level of community participation, which is given in Table 11.

In the growth curve analysis in Table 12, I compare the top and the bottom quartile in terms of community participation. These are the 114 contestants in the bottom quartile of community participation and the 91 contestants in the top quartile of community participation (Table 11). In total, I look at 205 contestants in two groups in the growth curve analysis. For each of the contestants in both groups I used the score of

the first ten submissions to Threadless to analyse their learning. Thus in total I included 2050 observations in the analysis. To make the results easier to read, the growth curve analysis was run twice swapping the reference group (table 12). The results in both columns are consistent. In the first column of table 12 the results with the bottom quartile as a reference group are shown and in the second with the top quartile.

The learning of the two quartiles is shown in the rate of learning. It shows the change of the score of contestants from one submission to the next. The rate of learning of the bottom quartile is 0.018 and 0.032 for the top quartile. This means that both groups learn and improve their scores from one submission to the next. Furthermore, the rate of learning is almost twice as high for the top quartile than for the bottom quartile. The learning effects are highly significant at a 0.1% level. The interaction terms ("Rate of learning*top quartile" and "Rate of learning*bottom quartile") measure the difference in the rate of learning between the two quartiles. The difference is 0.014. This difference in learning is statistically significant at a 1% level. Contestants that participate heavily in the community learn significantly more than those with only a low participation in the community.

Using time dummies for the ten contests in the growth curve analysis, I illustrate, in Figure 3, the development of contestant scores over ten contests. This analysis indicates that contestants who participate in the community (those in top quartile in initiating blog postings) learn more at a faster rate than those with lower participation (those in bottom quartile in initiating blog postings). Lower-participating contestants only significantly improve after their ninth submission.

.

Table 11: Sample for growth curve analysis of contestants' learning

Quartiles of community participation	Measure of community participation – number of blog posts initiated	Number of contestants
Bottom quartile	0 - 14	114
2nd quartile	15 - 22	110
3rd quartile	23 - 39	96
Top quartile	>39	91

Notes:
Based on Threadless members who joined in 2009 and who made at least ten design submissions and had an initial score of less than 2.5
Data represents activity from 2009-2012

Table 12: Growth curve analysis of contestants' learning

	Reference group: Bottom quartile of community participation	Reference group (reversed): Top quartile of community participation
Rate of learning	0.018***	0.032***
Rate of learning*top quartile	0.014**	
Rate of learning*bottom quartile		-0.014**
Bottom quartile intercept	1.787***	-0.166***
Top quartile intercept	0.166***	1.954***
Contestants	205	205
Observations	2050	2050

Notes:
* p<0.05, ** p<0.01, *** p<0.001
Based on Threadless members who joined in 2009 and who made at least ten design submissions and had an initial score of less than 2.5
Data represents activity from 2009-2012
Comparison of members in highest and lowest quartile in community participation

Overall, my quantitative analysis of Threadless contestants demonstrates that initially lower-skilled contestants can later have value to the firm. Furthermore, my analysis indicates that the community plays an important role in driving contestants learning, something my qualitative analysis was able to further explore.

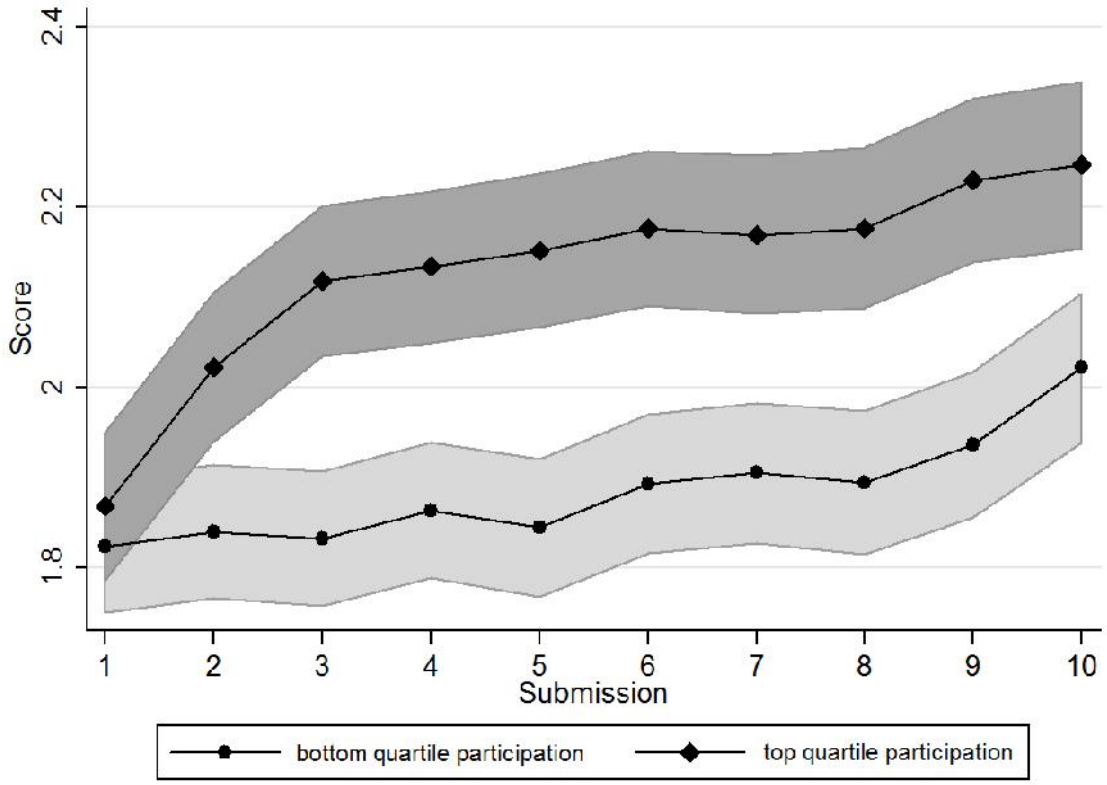


Figure 3: Growth curves of contestants' scores over the course of ten submissions
(205 contestants across two quartiles; 95% confidence intervals in grey)

Experiential learning in community-based contests

Community participation enhanced contestants' learning, making them learn more and more quickly. Contestants did not learn through being explicitly taught by someone but through their experience in participating in the contest and the community, as illustrated in this quote from one Threadless contestant:

> "[After I began,] I definitely wanted to do better…when I was submitting my first shirts I started looking at more designs and actually scoring more designs. I really didn't score too many designs until I started submitting. So then I would see other designs and see other peoples' styles and get other critics and feedback, and that really, like, encouraged me to, you know, try new things and kind of get out of my comfort zone of how I was illustrating. That kind of really got me into more interested in that community aspect" (Threadless contestant).

As this statement suggests, the learning that results from community participation can be attributed to the fact that the learning from the community is complementary to learning from the contests. The community consists of different elements that help contestants to develop better knowledge from their contest experience and, thus, improve their skills for the contests. These elements help contestants understand their own performance, reflect on participation in the contests, derive principles and generalisations about how to become successful and to experiment and to sharpen their newly learnt skills and prepare for the next contests.

In the following I will describe the way that learning both from the contest and through the community are mutually reinforcing in more detail using Kolb's (1984) theory of experiential learning. The cycle of such learning goes through four stages: 1. Concrete experience, 2. Reflective observation, 3. Abstract conceptualisation, and 4. Active experimentation. Learning according to this cycle is the result of two related types of activities: knowledge acquisition and knowledge transformation. The first and third steps of the cycle focus on different ways of knowledge acquisition. Knowledge transformation activities take place in the second and fourth stage. I will highlight how the design features of the community-based innovation contest created a learning environment for experiential learning. Table 13 summarizes the findings which I will address in turn.

Concrete experience

I first address elements of the contest that relate to gaining concrete experience. Unlike innovation contests that may be done infrequently, the community-based innovation contests I studied were held on a regular basis. This enabled contestants to have recurrent experiences that drew on similar skills, such as T-shirt or automotive design. The contests were open to contestants of all skill levels, making the contest initially challenging for the majority of contestants. These design elements are summarized in the first column of Table 13. The innovation contests provided contestants with the opportunity to experience what skills they required to create ideas for companies on a professional level.

In interviews, contestants often remembered their initial entries most intensely. Individuals often joined with a naïve understanding of what was needed to compete. One Threadless contestant recalled: “I started doing some designs for fun on the computer… so I was, like, let me actually try to submit it to Threadless. And I submitted, and I did horrible.” After these initial failures, contestants then realised what skills they would need to compete successfully. Another contestant told me:

> “I really wanted to submit something, and then I realized I don’t even know how to submit because I needed to have at least some basic Photoshop skills to prepare my design presentation. But I didn't give up, I found some tutorials online and finally managed to submit my first design. Needless to say, it was poor presentation and the design wasn't really "Threadlessy"; it was one of my black and white drawings, rather dark, and comments [from the community] were not really encouraging, but I was happy anyway because I've finally submitted something. You can see it here for yourself, my first failure. It didn't get printed, of course.” (Threadless contestant)

Table 13: Experiential learning in community-based innovation contests

Design features of innovation contest	Individual learning processes	Threadless examples	Local Motors examples
Concrete experience elements			
• Regular repeated contests • Contest open to contestants of all skill levels	• Experience of skill requirements • Emotional experience of participation	*Experience of skill requirements:* "I learned…that I am not good in design; you know when I started Threadless, I knew I'm very bad in design. I am from comic background, and don't know about colours, don't know about placements on T shirts…" (Contestant)	*Experience of skill requirements and emotional experience of participation:* "I think that [the contest] really snaps a lot of people out of their comfort zone… by adding the specific criteria and deliverables of Local Motors…It forces me to look at what deliverables are required." (Contestant)
Reflective observation elements			
• Ability for scoring and feedback • Member profiles with competition history • Galleries of successful entries	• Receive community feedback • Observe and score other entries • Collaborate with others	*Collaborate with others:* "From people I collaborate with I can see how another person thinks and how I can learn from that...as I collaborate with people I can see their point of view of how they go about design" (Contestant)	*Observe other entries:* "I had no sense of perspective as I was starting off…[later] I started to see a lot of the other renderings that were being posted on the site, particularly by [one particular contestant]; he did a lot of very interesting renderings" (Contestant)
Abstract conceptualization elements			
• Forum for contestants' discussions • Support experienced members to create tutorials	• Joint identification of success factors • Teaching by experienced contestants	*Joint identification of success factors:* "[We] can get advice if you got copyright issues or just general design issues. I know that I can obviously just hone in and tap into [the community] and get advice there as well" (Contestant)	*Teaching by experienced contestants:* "[The community] was a sharing of, 'here's how I do this in Photoshop, here is this tutorial…' It was kind of a place where you could learn and you could share knowledge" (Community manager)
Active experimentation elements			
• Sponsorship of community-initiated challenges • Providing tools for experimentation	• Community initiated challenges • Feedback on experiments	*Feedback on experiments:* "A lot of people use our site for improving their work, getting feedback from other artists, getting feedback from the voters, just doing as much drawing as they can. And we have seen some artists really, really improve over time" (Community manager)	*Feedback on experiments:* "And in order to know in which direction I have to go to, I submit these things [to the community]. So I know, then they basically tell me that I am going in the right direction or I am going in the wrong direction…" (Contestant).

Contestants also related that they learned about the contest process itself. For them competing was "exciting" and, as illustrated by a member of Local Motors quoted in Table 13, it "snaps a lot of people out of their comfort zone." Interestingly, even highly successful contestants acknowledged that they could not tell whether their entries would perform well or not.

Fitting with theories of experiential learning, in the concrete experience stage individuals gained new knowledge through a first-hand participation which often included highly emotional elements (Kolb & Fry, 1975). Contestants learned about what the contest required and where they stood in terms of their skills.

Reflective observation

The design features of the community-based innovation contest helped promote reflective observation, as I also outline in Table 13. For example, contestants could see feedback not only on their own contest entries but also on other contestants' entries through "profile pages" of members in the community. In both settings, online galleries featured previously successful submissions and contestants.

Reflective observation involves thinking about and evaluating experiences (Kolb, 1984). While in traditional innovation contests contestants would have to reflect alone, in the community-based contests contestants could draw from the evaluations of fellow community members of their own and others' performance. Online comments helped community members in learning from their own contest experience. As one Threadless contestant acknowledged: "…'it's almost like an art class, in a way, where you get

critiques from your peers and you get their…approval, disapproval. And I think that really helped me, you know, to get to that first print." Contestants related that they felt able to adjust their contributions based on feedback received from the community. One reflected that "the next time I sat down to design, I kind of go: 'right, they are going to like this color, they are not going to be able to knock this. The perspective is right". He then further reflected that he spent "…an awful lot more time analysing my own work before I submitted it, so I didn't have as many of those criticisms. So it made me a much better designer". Contestants at Local Motors recalled similar experiences, one stating that "'the feedback I was getting was so good I didn't really require going to other websites for competitions."

Contestants also observed and reflected on the experience of others. One interviewee described this proess, saying, "I started to change my viewpoint— maybe I started to grow more as an artist—because I was looking at other people's work and seeing how, you know, they use textures and certain colour traces; and it really helped me grow as an artist on Threadless. Similarly, at Local Motors, contestants recounted how much learning came from observing other contestants in the community:

> "[One other contestant] uses Google Sketchup in ways that I don't think it was ever intended, but it's beautiful and it's amazing work. But to be in touch with so many different types of designers, and watching their personal growth, and learning from them, as well them learning from me…that's the reason why I keep coming back, and [why] I always stayed with it, and [why] it was so exciting for me" (Local Motors contestant).

Contestants reported how scoring other contestants' entries helped them to understand what might or might not work as a successful contest entry: "I see a lot of designs and vote in Threadless every day. This routine allows me to stay current on trends

and styles. And also it is a way of inspiration." Contestants intentionally scored designs in order to learn from these designs. One Threadless contestant outlined how "I would like to think about what the community would purchase; that's why I tend to try to score every single design being submitted".

Furthermore, the community provided contestants with the opportunity to identify other contestants' skill levels and in some cases to form partnerships with them. As one Threadless community member related:

> "And I've learnt from the best, because I have been able to just watch what they do and even in some cases collaborate with them. Like when I have collaborated with [Alex] a few times and we got a print together. He actually re-did a drawing that I had done, and I was able to compare what I drew versus what he drew and it's just remarkable to see what he can do… So it's fun to watch that and to learn from those guys" (Threadless contestant).

As illustrated with these examples, and as outlined in Table 13, the community helps contestants not only to reflect on their own experiences through the comments by fellow community members, but also to reflect on the experiences of others. This co-operation created a richer learning environment than there would have been in a contest without a community.

Abstract Conceptualisation

Abstract conceptualisation concerns itself with understanding underlying principles and formulating knowledge around such principles. In the context of innovation contests, this pertains to forming an understanding of what makes for a successful submission to the firm.

My interviews provided examples of contestants who tried to find underlying patterns, styles and techniques that worked well. One Threadless contestant recalled "I would try and pick out certain points of what makes a successful design, from subject matter to a certain aesthetic style—or it could be just maybe I may need a pop culture reference [in the design] or something like that."

I observed that discussions included topics such as what components a successful design has, what ideas are well received, and how best to present the work to be successful. For instance, in the Local Motors community, contestants discussed the crucial importance of the final three-dimensional rendering of a new car concept for the final submission. They agreed that it is often not the best idea that wins, but a good idea that is very well presented. Similarly, T-Shirts are subject to certain trends. Groups of contestants conversed about what might be successful. One related that "we exchange ideas, experiences, sharing ideas, techniques and styles of drawing, the latest trend information."

I found that more experienced contestants would, at times, take on a mentoring role for newer contestants. One Threadless contestant discussed the importance of "mentoring" newer members. A Local Motors contestant described his experience:

> "We all turn around and ask the professionals with years of experience, and that's just a nice kind of downward flowing "hot bed" of knowledge…You know they've turned around and taken me under their wings. Yeah, I have grown leaps and bounds just in the few years I have been with them" (Local Motors contestant).

There were even formal tutorials established by more experienced members, either with the encouragement of the firm or independently. Some contestants shared their experience of creating contest entries with the community so that others could profit from

their advice. As one Local Motors contestant narrated, “a lot of those community members have YouTube accounts where they post not only tutorials but just videos of how they render. It is great to pick up techniques from that.” Likewise, at Threadless, a contestant described how “designers have been doing those videos where they will show a time lapse of them working. I have watched a few of those from a few designers and those are really helpful, for sure.” Overall, the community collectively created knowledge about successful techniques for the contest.

Active experimentation

As I outline in Table 13, the design of the community provided contestants with an environment for experimentation. They could try out new techniques or ideas before they used them in a contest. Furthermore, contestants used the community to run small challenges independent of the firm, to sharpen their skills. Firms would sponsor experimentation or skill development challenges by offering prizes.

Contestants regularly used the community to present their new ideas and to gain initial feedback. As one contestant related:

> “I have pretty uniform system that I have developed now. I’ll post a few sketches, a few times a week; I’ll probably post 10 sketches a week [with] different ideas that I have, and the community tells me if any of them are good. That’s the first step for me because I found in the past I had wasted a lot of effort on concepts that weren’t very good”

Besides this individual experimentation, with the community as a feedback resource, there was also collective experimentation in the community. For instance, different community members regularly came up with challenges that were then broadcast

for the entire community to participate in. Local Motors community members held so-called “jousts” in which two members had to create a design based on a specific topic they decided on, and then the rest of the community could vote. Similarly, Threadless contestants created challenges like the “minimalism challenge” in which community members need to generate a design with a limited number of colors. Overall, the community provided contestants with an arena of experimentation to develop their skills further and to prepare for contests through experimentation.

Individual learning and sustained participation

Learning by contestants in the community was valuable for the firms, as it meant they could get high quality submissions. The learning process was not only valuable to the firm but naturally also to contestants. As one Local Motors contestant put it: “I am not considering Local Motors as a way to get…payments for competitions, prizes, and stuff like that. I am using it as a portal to learn...”. Similar opinions were also common among Threadless contestants. One said: “The best thing, I guess, was the help from the community—[becoming] a better designer”.

Even though the actual chance of winning a contest at Threadless or Local Motors was low, opportunities for learning made participation worthwhile, even for those who did not yet have the skills to win a contest—making “everyone a winner.” Contestants acknowledged that learning was a strong motivator for taking part: “I definitely always try to improve my, you know, my execution, my style, this is why I try to tend to submit to Threadless a lot”. Or, as a contestant from Local Motors acknowledged: “I’m trying to

get better, and I want to try and improve…so that's what I'm focusing on now: trying to get as much stuff out there, and Local Motors is helping me with that."

Even experienced contestants that had won multiple times admitted that learning was still a strong driver for them to come back to the contests. One stated that:

> "…I am still learning and developing as an artist. And I think that's still the number one priority in terms of the reasons I keep coming back. I have…I found that actually I have gotten so much better as an artist because of all the other input that I have gotten through Threadless. […] I would be at the same level I was in 2008 if it wasn't for Threadless, for sure" (Established Threadless designer, interviewed in 2011)

As illustrated by this informant, in addition to increasing skill levels, learning helped firms in motivating and retaining contestants over a period that could span years. One contestant compared her experience designing for Threadless to her experience with another website that focused on logo and graphic design contests, CrowdSpring. This firm's website did not feature a community for learning, and the contestant revealed that "…when I get to CrowdSpring I would log my time […to] make sure I will always spend this amount of time on this amount [of prize money]. On Threadless, I mean I've spent hours and hours on a design."

A senior manager I interviewed at Threadless acknowledged the way in which learning helped motivate participation:

> "I think there is a lot of value [in the community]. That goes for people who win the challenges and those who don't and are just getting a lot great value through of submitting, getting feedback, getting to know other people and having some fun in the process." (Threadless top management).

Learning in community-based innovation contests made participating worthwhile even for contestants that initially had weaker skills and little chance of winning. Even

with large numbers of contestants, participation was supported and sustained, providing a large potential pool of ideas to the firms.

4.5 Discussion

Previous research has taken a static perspective on the nature of contributors to innovation contests (Fullerton & McAfee, 1999; Terwiesch & Xu, 2008), where individual contestants are seen as having a fixed skill set. Under many forms of innovation contest, the central challenge of firms is in the sourcing and screening of high-quality submissions. At the same time, a multitude of previous research has recognised that communities offer great potential for learning and the development of skills for innovation (Jeppesen & Frederiksen, 2006; von Krogh et al., 2003).

My first contribution is to provide a more dynamic perspective on contestant skills in innovation contests. More specifically, using my analysis of repeated innovation contests, I find contestants' skills are not static but that they improve through experiential learning. As a result, even contestants that at first lack skills to make contributions can later develop into valuable contributors. In community-based innovation contests, firms provide the ability for contestants to interact within a community.

My second major contribution is in showing that those who participated more in the community showed significantly higher, faster and more consistent improvement in their contest performance than did those who did not participate as much. My panel data analysis suggests that community-participation is a key resource for enhancing contestant learning. My qualitative data analysis suggests that the learning benefits gained from the

community comes from the contest and community complementing each other in promoting experiential learning (Kolb, 1984). Contestants have the chance to regularly participate in contests. The community helps them to reflect on their experiences and provides further learning by presenting the work and critiques of other contestants. Furthermore, the community is a resource where contestants can exchange and develop knowledge about factors that promote successful entries. The community provides an area in which contestants can experiment before participating in the actual contests. Overall, community-based contests provide an experiential learning environment in which contestants can develop their skills.

My third contribution is in not only providing empirical support for an experiential learning process, but in extending the notion of experiential learning into a realm of open innovation that crosses organisational boundaries. Experiential learning has served as a long-standing framework in the social sciences (Kolb et al., 2001). As I worked with my inductive data, I found it naturally fitted within the experiential framework and allowed me to analyse the mechanisms that underlay the learning I found through the growth curve analysis. While I found the experiential learning framework matched my data well, I believe I make a new contribution in showing experiential learning across the boundary of organisations and communities.

I also contribute by considering factors that companies need to take into account in the design of open innovation communities. I found the design features of the Threadless and Local Motors online communities facilitated experiential learning. Successful experiential learning requires generating knowledge from experience (Mason, 1993). Firms can design the blog and comments fields of online communities in such a

way as to facilitate this type of learning. Making it easy to develop an online profile and communicate within the community supports the exchange of ideas. Such exchange with other learners can improve reflection and help in creating knowledge from experiences (Freitas & Neumann, 2009; Kolb & Kolb, 2005). As I did not study the online community since the inception of these companies, I do not know if they always addressed elements of experiential learning. Nonetheless, I suspect the longevity of these firms and their communities is due in part to the elements that were in place at the time of my study.

Fourthly, I contribute to new ways of linking communities and competition more broadly too. As mentioned in my literature review on innovation communities, the online communities that support contestants at Threadless and Local Motors match well with the characteristics of more general communities-as-practice (Lave & Wenger, 1991; Wenger, 1998). Other online communities have been previously studied through this perspective (Lee & Cole, 2003) and found to share many of the characteristics of such communities. For example, there are sustained mutual relationships, a rapid flow of information, and specific tools provided to go about one's work (Lave & Wenger, 1991). The community-of-practice perspective is especially helpful in understanding how firms can sustain such online communities over time. These communities are "occupational communities" with "little hierarchy; the only real status is member" (Brown & Duguid, 1991; Orr, 1990, p.33) where one can learn a craft, that of designer or innovator, not covered under more formal professional codes.

I propose that there is one significant omission in most practice-based conceptions of online communities: while some have noted rivalry or status competition within settings such as open source communities (O'Mahony & Ferraro 2007), most accounts

generally fail to recognise the possible contribution of contests within communities. At first, formal contests would appear to be at odds with an understanding of community, as most accounts focus on mutual learning and cooperation and an absence of explicit competitions (Orr, 1996). I propose regular contests may enhance communities-of-practice in three ways. First, it provides a means to learn who the experts are in the community. Regular small-scale contests allow a degree of signalling expertise that is not available within a relatively non-hierarchical community. Secondly, regular contests contribute to the flow of information essential to a community dynamic. Lave & Wenger (1991) describe how a regular flow of information supports innovation within a community. Contests at Threadless, for example, provide information to the community about recent tastes as well as the changing skill mix of contestants. Finally, regular contests enhance the self-identity among participants, as they are able to identify as active designers, rather than passive consumers of information. Future research could explore the degree to which the timing of competitions may enhance or moderate the effectiveness of a community in providing a stream of novel ideas.

When would I expect this hybrid form of innovation contest to occur? Forming and managing community-based innovation contests takes more effort than running contests on their own. Based on my two cases, I propose three conditions under which this form of open innovation might be profitably employed by firms. First, the form is useful when there is a need for on-going ideation, rather than the limited use of broadcast search (Jeppesen & Lakhani, 2010). It only makes sense to invest in creating a community if a firm intends to run a number of repeated contests. Secondly, the form will occur when there is value in bringing together contestants with shared interests to form an

occupational community (Lee & Cole, 2003), such as one made up of visual or product designers. In these cases, the firm can make use of similar contributions for its on-going contests. If the contests of a firm are in different domains, it is unlikely that it will be able to create one community that is active in all these domains. Thirdly, we can expect to see this form when contestants have some chance to individually identify the result of their effort. This stands in contrast to innovation in open-source software collaborative communities, where the outcome is collective (O'Mahony & Ferraro, 2007).

This hybrid approach to open innovation blends elements of online communities with innovation contests. In Table 14, I contrast this approach with others. Most online innovation communities are primarily used to coordinate collaborative innovation of multiple members, such as to create open source software. In community-based contests, the community brings together multiple contestants who create entries for the firm's benefit. Rather than jointly producing a product, this type of community is more strongly focused on exchanging experiences and knowledge for skill development. As such, it is similar to other types of knowledge sharing communities, such as communities of practice (Lave & Wenger 1991).

At the same time, the contests differ from those that are focused on a one-off broadcast search for new insight. One advantage of an innovation contest without a community is the increased availability of multiple knowledge domains (Verona et al., 2006). In community-based contests, contests tapping into the same knowledge domain are frequent, and indeed benefit from being within the same occupational community.

Table 14: Community-based innovation contests compared with other models of open innovation

	Online community	Community-based innovation contest	Innovation contest
Examples	Open source software Propellerhead	Threadless Local Motors	Innocentive Atizio
Nature of ideation	Ongoing community	Recurrent contests Ongoing community	One-off contests
Focus of community	Coordination of innovation & knowledge sharing	Knowledge sharing & learning	None
Type of contest	None	Contests focused on one knowledge domain	Contests across multiple domains
Primary role of firm	Sponsorship of community in firm-hosted communities	Sponsorship of community, support learning environment, set prize and contest brief	Set prize and define contest brief
Contributors' skills	Developing	Developing	Assumed static

My research design allowed me to focus on the common processes in place in two long-standing and successful community-based innovation contests. As I drew from these two cases, I did not have a design to explain possible variations and the relative importance of different elements of these contests. Further research could explore whether experimentation or opportunities for observation are more important for developing contestants. My research shows that contests and community can work together and improve and complement each other for learning. My research focuses less on the attitudes and underlying motives of why contestants work together and improve one another's skills. This could be explored by further research.

For most firms pursing an open innovation strategy, community-based innovation contests will likely serve only one component of a firm's portfolio of innovation efforts. Threadless and Local Motors relied on community-based innovation contests exclusively,

and these research settings provided a pure example in which I could best examine the workings of this form of innovation. Other companies have simultaneously used this alongside other open innovation models as well (Hutter et al., 2011). For example, community-based innovation contests can occur alongside suppliers as alternative sources for ideas (Petersen et al., 2003) or alongside the use of virtual knowledge brokers to provide distant searches for challenging technical problems (Verona et al., 2006).

4.6 Conclusion

Community and contests are often pitted against each other, but my study helps to define how communities can provide benefits within competitive contexts. I have empirically demonstrated how contestants can learn skills within the context of firm-hosted communities. Rather than sourcing and screening high-quality contestants, under this hybrid model a broad range of initial contestant skills are useful in the longer term. Over time, the experiential learning process means that, potentially, "everyone's a winner." This hybrid form of innovation will be most appropriate when firms seek to engage a community in repeated innovation, when members of the community can share a common skill set, and when it is possible for members to identify their individual efforts. I hope my study provides some clarity to the call for stronger focus on the variation within open innovation approaches (West & Bogers, 2011). Open innovation continues to hold much promise for organisations, but that promise is best realised when we understand the full range of approaches available and under what circumstances different forms of open innovation can best meet an organisation's objectives.

Chapter 5: Sustaining the flow of external ideas: Community management practices and social identity in firm-hosted online communities

"If Local Motors called me up today and said, we can't pay you for this. But could you go to the next county over, there is a manufacturers' meeting, there is a car show there. Could you go over there and represent us for the whole day. We not going to give you a cent for it, but if you could go over there we would appreciate it! I would do it because I feel so much a part of the company"

(Local Motors community member during interview).

5.1 Introduction

Firms have increasingly relied on distributed innovation models to help them generate new ideas, often involving members from the wider public through online communities (Dahan & Hauser, 2002). Research has shown that such members can outperform the ideas generated by internal R&D (Kristensson et al., 2004; Poetz & Schreier, 2012). Firms have used different approaches for involving the public. Some firms use third-party online idea platforms through which individuals can submit their ideas and compete as part of an innovation contest, which, in turn serves as a form of broadcast search (Jeppesen & Lakhani, 2010; Nambisan, 2002; Verona et al., 2006). Other firms have created firm-hosted online communities in which contributors interact, learn from each other, collaborate (Jeppesen & Frederiksen, 2006), and possibly also compete for prizes (Bullinger et al., 2010). Firms can then draw on these online communities for their innovation process as part of their flow of both internal and external ideas.

One of the central challenges that firms face is to ensure a consistent inflow of contributions from the community (Bayus, 2013). Indeed, many online communities do not gain traction and are unsustainable (Iriberri & Leroy, 2009). Over the years of studying online communities in various forms, there has emerged an understanding of a range of motivations as to why individuals might participate as a member of an online community (Jeppesen & Frederiksen, 2006; Lakhani & von Hippel, 2003; Shah, 2006; Wiertz & de Ruyter, 2007). At the most basic level, there may be extrinsic monetary rewards, as in the case of community-based innovation contests (Boudreau & Lakhani, 2009; Bullinger et al., 2010). However, it is unlikely that monetary rewards are sufficient

to sustain long-term involvement in communities devoted to innovation, especially as the chances for monetary rewards per participant decline as the community grows (Terwiesch & Xu, 2008).

In the absence of strong monetary incentives, one factor thought to be particularly helpful in engaging members of online communities over time is member identification with the firm (Nambisan & Baron, 2009). Using the lens of social identity, initial studies have suggested that individuals who feel a higher level of identification with the firm are more likely to sustain engagement with them. While researchers have explored the role of identification initially as one factor motivating community members (Nambisan & Baron, 2010), prior work in this area is limited, and we know little about the specific practices firms may carry out to build positive social identity between the community and firm.

I designed my study in order to understand specifically what firm practices help to build positive social identity among members of firm-hosted online communities. Building or creating social identity means that firms make community members feel part of the firm. I specifically wanted to look at both firm and member perspectives in understanding what practices firms used that community members valued. I inductively came to focus on joint firm-community identity, rather than necessarily treating each element individually as in past studies (Nambisan and Baron, 2010). Given the nascent state of research in this area, I used an inductive case-based method (Eisenhardt, 1989), drawing from data in a larger study of firm-hosted online communities at two firms.

I was given unusually open access to two firms who have managed to sustain engagement with online communities successfully over several years. At the time of my study, the Chicago-based T-shirt firm Threadless had sustained an online community for

their designs for over twelve years. The Phoenix-based automotive firm Local Motors had developed several car models with an online community over the course of five years. My study aimed to understand how these firms could engage with an online community over such a sustained period of time, especially as the communities were relatively large. Engagement is the ability of the firm to make community members contribute to the firms' innovation efforts over an extended period of time. I used social identity theory to understand the role of creating positive joint firm-community identity. Evidence indicated that community members felt part of the firm and held very positive views of the firm, leading to sustained engagement. Based on interviews with firm and community members, observations, and archival data, I identified the practices that lead to creating positive joint firm-community identity and how these practices fit with the three main elements of social identity.

Understanding the underlying practices that sustain joint identity is important in order to move forward theories concerning the use of online communities for innovation, as well as to help managers create positive relations with firm-hosted communities. Furthermore, only if we can specify which management practices have an effect on community members can we fully understand what constructs such as an "innovation partnership" between firms and communities (Nambisan & Baron, 2009, 2010) actually mean in practice.

5.2 Engagement of firm-hosted online communities for innovation

Previous research on firm-hosted online communities has often investigated why community members contribute. Jeppesen and Frederiksen (2006) looked at Swedish computer-controlled music instrument company Propellerhead and found that members were mainly motivated to innovate by firm, rather than peer, recognition. Further research established that it is not the individuals' loyalty to a specific brand but their interest in the creative process that motivates them to participate (Füller et al., 2008) in addition to their willingness to interact online (Wiertz & de Ruyter, 2007). Overall, community members value learning, fun and interaction when contributing to firm-hosted communities (Nambisan & Baron, 2009); if they feel that they participate in an "innovation partnership", fostered in part through feeling part of the firm, they are more willing to contribute to the firm (Nambisan & Baron, 2010).

While we have substantial evidence on what motivates community members in broad terms, we know empirically little about what firms can do to engage a community. There is growing support that the business practices of firms which host online communities can create engagement. One particularly well-designed study looked in some detail at the different ways in which participants in online communities may be encouraged to participate in firm-sponsored efforts at innovation. Porter and Donthu (2008) conducted a survey of over 600 members of online communities and their perception of how they were treated by the hosting firm. In this large sample, the perceived effort by the firm to provide quality content and to give opportunities for members to feel embedded in the firms' efforts directly related to measures of shared values, respect, and trust. The presence of these values ultimately supported a willingness

to cooperate in innovation efforts. This study is one of a few (Dahlander & Piezunka, 2012; Nambisan & Baron, 2010) that has highlighted that the community members' perceptions of a firm is important in fostering engagement. The design of this type of study, however, has focused on clusters of measures rather than the specific practices of firms.

In summary, there is much research which demonstrates that a range of motivations bring about engagement in online communities. Even though research has suggested that the creation of a social identity is one important factor, the details of what practices firms can use to foster this mind-set has not received any attention. Instead, the research focus has remained on the perspectives of individual members of these communities. Before further articulating the motivations for my study, I want to examine social identity theory in more detail.

5.3 Social identity theory

Social identity theory is a social psychological theory developed primarily by Henri Tajfel at the beginning of the 1970s (Tajfel, 1972, 1974, 1978). It is widely considered one of the most significant theories of the relationship between self and group (Hogg, 2006). It focuses on individuals' self-perception of group membership and the effects thereof. It adopts a cognitive group definition: a group member is a group member if they perceive themselves as such (Hogg, 2006). Tajfel defined social identity as "the individual's knowledge that he belongs to certain social groups together with some emotional and value significance to him of this group membership" (Tajfel, 1972, p.292).

Individuals have a personal identity, which centres around personal attributes, abilities, and characteristics; in addition they have a social identity, which is made of the various group memberships that the individuals feel they have (Ashforth & Mael, 1989). While most individuals have multiple social identities, only one of these identities is salient at any given point in time. This identity then governs the individuals' behaviour at this point in time (Hogg, 2006).

Previous research has identified three distinct components of social identity (Ellemers, Kortekaas, & Ouwerkerk, 1999): self-categorisation, status judgement, and emotional involvement. Self-categorisation represents a cognitive awareness: an individual needs to be aware of group membership and to categorise himself as part of the group. The second element of social identity is an evaluative status judgement. The individual judges the group as possessing a positive or negative value. Thirdly, emotional involvement describes the individual's feelings of affection towards the group. Most previous research has measured social identity based on the first component, self-categorisation (Ellemers et al., 1999). However, all three components are important (Ashforth & Mael, 1989), and depending on the state of the three components, individuals will behave differently towards a group (Mullen, Brown, & Smith, 1992). For example, if individuals feel more emotionally involved in the group, this will have a positive effect in terms of their engagement with the group and may be a primary contributor toward individuals' behaviour (Ellemers et al., 1999).

Social identity and engagement with organisations

Individuals are more like to help an organisation and follow its norms if they feel as though they are an active part of it (Hogg, 2006; Terry & Hogg, 1996). Research shows that if individuals identify strongly with the organisation, they work harder than on their own (Fielding & Hogg, 2000). Furthermore, individuals that identify with a particular organisation are less likely to leave that organisation (Abrams & Hogg, 1998).

For firms to create social identity and engagement, they must address the three components of social identity: self-categorisation, status judgement of the organisation and emotional involvement (Ellemers et al., 1999).

One of the key roles a firm plays is to create a identity that employees identify with (Kogut & Zander, 1996). As such a key objective in creating social identity for a firm must be to show and emphasise its distinctiveness to help members perceive the organisation as distinct from other organisations and the environment and something to identify with (Ashforth & Mael, 1989). The organisational boundaries help to create an entity that is distinct from the market or other firms. As a result, typically when being hired by a firm, employees acknowledge that they are now part of that group independent of any value judgement about that social identity.

Self-categorisation as a member of a firm in itself has an effect on these people's behaviour (Kogut & Zander, 1996). Employees cooperate more with other members than they would do with non-firm members. Tajfel and colleagues (1971) tested whether simply belonging to a group changes behaviour. They assigned English schoolboys randomly to two groups. In this experiment, the boys showed favourable behaviour towards the group they were assigned to. Similarly, Tyler and Blader (2000) found that

employees who simply identify with their work organisation were more likely to engage in cooperative and beneficial behaviour.

To address self-characterisation, managers may aim to communicate and create a sense of shared identity to engage individuals to carry out particular activities (Ellemers, Gilder, & Haslam, 2004). “Insights from social identity theory to issues of leadership emphasises the point that the secret of successful leadership lies in the capacity of the leader to induce followers to perceive him or her as the embodiment of a positive social identity that they have in common and that distinguishes them from others” (Ellemers et al., 2004, p.469). Taken into the realm of firms interacting with communities, a firm can better engage a hosted community if it can convince the community that they have a shared social identity with the same objectives and view of the world (Hogg, 2006).

Self-esteem also contributes to social identity, as membership can be a factor in increasing self-esteem (Hogg & Turner, 1985). For instance, the social status of an organisation relates to how far members identify with it, as seen in how US college students feel loyalty to their university (Ashforth & Mael, 1989). Individuals will engage more highly with an organisation if they feel that through their membership their self-worth is increased (Tyler, 2001).

Beyond the status of the organisation, the treatment of members by the organisation is important for how much they involve themselves. In order to have the emotional commitment to the organisation, the third component of social identity, individuals need to feel pride and respect. If people get an increased sense of these attributes from organisational membership then it motivates people to engage with the firm in order to maintain and increase their self-worth (Tyler, 2001). This means that if a

firm can create pride and show respect for individuals that are active or feel as though they are members of their organisation, then the company will be able to generate engagement from these people. The research of Tyler and Blader (2000) supports this contention. They find that organisational identification was mainly related to respect and pride rather than the rewards that individuals received from the organisation. Tyler and colleagues (1996) investigated the effects of pride and perceived respect in four different settings including family, work, university and politics. The results show that both of these feelings had a positive impact on cooperative engagement in all four settings. A key factor that creates pride and respect for organisational members is the perception of fair treatment (Tyler & Blader, 2000). With regards to firm-hosted online communities, Porter and Donthu (2008) have shown that the perception of shared values with, and respect from, the firm lead to loyalty and contributions to innovation from community members.

While research has been conducted which found that firms may create social identity for individual employees and thereby induce engagement toward shared goals, little research has examined how a firm can deal with the challenge of creating positive social identity for individuals beyond its boundaries in a firm-hosted online community. Though some studies have considered the social identity of the firm and the community separately (Nambisan & Baron, 2010) I believe social identity theory can provide a perspective that is appropriate for exploring the development of a joint firm-community identity. My study was designed to specifically understand which firm practices help to build positive social identity among members of firm-hosted online communities. I deliberately wanted to look at both firm and member perspectives to understand what practices were used by firms to build joint firm-community identity.

5.4 Research method

Given that research on the firm practices that lead to positive social identity and community engagement is still in their early stages, I adopted an inductive case study methodology (Edmondson & McManus, 2007; Eisenhardt, 1989). Case studies are particularly relevant as the context mattered and it was not clear beforehand what the practices would be important and the effect that they would have (Yin, 2003).

In order to identify the practices that lead to engagement, I focused on selecting cases of firms that intensively, and for a long period of time, have used online communities to generate new product ideas. The advantages of such "pure" or "ideal type" cases have been shown in prior innovation research. For instance, a study focusing on the product design firm IDEO (Hargadon & Sutton, 1997) enabled the development of a model that outlined how to sustain repeated innovation. I secured access to two firms that had sustained experience in engaging firm-hosted online communities for a flow of new product ideas. Chicago-based T-shirt firm Threadless had, at the time of my study, over the past twelve years, created thousands of T-shirt designs. Phoenix-based automotive firm Local Motors had developed several different car models with its online community over the course of five years. Securing and conducting field research with these firms enabled me to observe community engagement in as pure as possible form. Nevertheless, the underlying practices identified have relevance for all firms that have a firm-hosted community, even if it is just one element of their innovation strategy.

Research setting

Threadless was founded in 2000 by Jake Nickel, a college student who, during his studies, was a member of an online artist community. Having seen how much fun it was to create T-shirt designs and compete to get designs printed, he set up Threadless in order to sponsor contests on a regular basis. Threadless ran an on-going contest to which anybody can submit designs that they believe would look good on a shirt. In addition, there were topical contests "Threadless loves challenges" that ask for designs on a specific topic. These are often used for collaborations with partners like Disney. Participants submit the designs on a mock-up shirt, as well as in a format that minimizes the effort needed to subsequently print the design on a shirt. At the time of my study, Threadless community members could vote on more than 1000 designs every week that were submitted by community members, with five new T-shirt designs printed each week. On top of this, Threadless had continuously received more than a five hundred submissions every week for more than five years. Several hundred members would vote on each design and community members typically received 10 to 20 comments by other community members on their design. Designs were selected based on Threadless' internal voting which comprised the designs that received the highest votes by the community.

Community members had different backgrounds and came mainly from three groups: 1. Art or graphic design students, 2. Hobbyists who had always enjoyed drawing but generally lacked an outlet, and 3. Graphic designers who were frustrated by the work they did in their day jobs. Threadless had become a well-known brand in graphic design globally, and so new designers were mainly attracted through word of mouth. The main purpose of the community was to support designers in the creation of their designs.

Threadless resembled a typical online clothing retailer in many ways. Most of its one-hundred employees worked in shipping, production management, IT and customer services. The key difference between Threadless and traditional clothing firms was that all the designs they printed came from the community, via regular contests. The limited number of internal employees in their "creative department" focused on selecting new products (such as iPhone cases or water bottles, internally called "canvasses" that community members could design) as well as on managing the selection process of community members' designs. The other key difference was the existence of a department focused on caring for the community. This department managed the interaction with the selected designers, monitored the community, and ran occasional big events. For instance, they organised an annual "family reunion," when all community members were invited to Chicago to a party sponsored by the company. Overall, Threadless was highly successful with its products. Companies like the US retailer Gap have had active collaborations with Threadless.

John B. ("Jay") Rogers, a business school graduate, founded Local Motors in 2007. He started the firm to develop and build the first "open source vehicle", and by 2009 the firm, in partnership with its community, had created the first prototype car, the Rallyfighter. The community was created as a place where designers and engineers could showcase and get feedback for their ideas. At the time of the study, the firm had also developed car concepts for the US Department of Defence, Shell, the US truck manufacturer Peterbilt, BMW, as well as US pizza delivery company Domino's. Over 15,000 members were registered in the Local Motors online community, called Local

Forge. They had the ability not only to compete in the contests run by Local Motors, but also to start and develop their own projects. The contests mainly focused on car design and ideas for car concepts, such as what would be the ‘ultimate pizza delivery vehicle’. In 2011, Local Motors aimed to broaden its community to also include engineers and car enthusiasts who enjoy working on their own cars. In line with this change, engineering-focused contests were added. Local Motors is known to car designers and has gained a wider reputation through its involvement with major firms like Domino’s and BMW.

Local Motors had the same basic functions as other car manufacturers, including a large production team running Rallyfighter production, a sales team, and a development team. The development team carried out the detailed engineering work that could not be conducted within the community, such as the integration of parts across the overall vehicle. The difference to other automotive firms was that the development team actively sought to explore which activities could be handed over to the community. Local Motors employed designers, but it lacked a design department for creating a full design for a new vehicle. Like Threadless, Local Motors had a “community management team” which set and ran the contests and managed daily interactions with community members. In 2011, Local Motors had roughly 30 employees.

Data collection and analysis

I was given unusually open access to these firms. Multiple sources of data were collected. Interviews were conducted at both firms with employees that were directly or indirectly involved with the community and with members from top management teams.

All of these interviews were conducted in person. Furthermore, a large number of community members who were involved with each of these firms were interviewed, mostly through Skype videoconferencing.

Selection of community members for interview was on the basis of their activity level in the community. They were either identified via their profile (which shows their level of activity) or through suggestions by the company. As with other online communities, there was an active core community (Dahlander & Frederiksen, 2012) and there was also a set of peripheral members who did not engage in the community on a regular basis. Forty-two out of the forty-seven interviews were done with active community members, consisting of those that regularly participated for an extended time in relevant blogs. As I show in Table 15, active members made most of the contributions to the firms' innovation process, both in quality and number. In this table, I provide a snapshot of all members that joined Threadless in 2009 and subsequently contributed designs. As is evident, there is clear difference between core members (those with above-average postings on blogs) and peripheral members (those with average or below average posting activity). Core members, those that were more active on the blogs, as a group made seven times more design submissions per person, and 88% of the participants that successfully contributed to Threadless came from this group. In contrast, in interviews with peripheral members of the community it was clear they had little experience with the firm and as such little to say about practices related to the community.

Table 15: Comparing core vs. peripheral community members in level of engagement with the firm

	Number of such members	Quantity of engagement: Average number of submissions per member	Quality of engagement: Number of members who won a design contest
"Core members" Above average community activity (more than 6 blogs initiated)	1677 (21% of members)	11.2 submissions/member	106 members (88% of winners)
"Peripheral members" Average or below community activity (less than 6 blogs initiated)	6642 (79% of members)	1.6 submissions/member	15 members (12% of winners)

Notes:
Based on Threadless members who joined in 2009 and who made at least one design submission
Average community activity was 5.2 blogs initiated
Data represents activity from 2009-2012

All of the interviews were transcribed, resulting in 1400 pages of verbatim transcription. Having both firm and community perspectives was important in developing insight into the practices and their effect on the community. Furthermore, I spent three months at the headquarters of each of the firms. This enabled me to validate practices identified through the interviews as well as identify salient practices that had become so common to employees that they had not reported them in the interviews. For triangulation, this data was complemented by internal documents as well as forum and blog data (Maylor & Blackmon, 2005).

The fieldwork and analysis followed an iterative model (Eisenhardt, 1989). Initially, I spent a couple of weeks at each of the firms to conduct initial interviews and observational work. This was followed by an initial analysis phase and a second round of fieldwork at both firms focusing on the interesting things and practices that had emerged during the first phase.

All data was analysed using NVivo 9 (Bazeley, 2007). Initially both cases were analysed individually through established practices (Eisenhardt, 1989). Elements of how the firms worked with the community and their effects were open coded (Saldaña, 2009). During this phase, the concept that community members felt part of the firm emerged from the data and led to the adoption of a social identity theory perspective. In a second phase, I identified recurrent firm activities and combined these into meaningful higher-order practices so as to record those activities that were regularly undertaken by the firms (Miles & Huberman, 1984). Practices reflect a repeated activity that one or several employees of the firm carry out. I followed this analysis by a cross case comparison of practices and their effects on the community (Eisenhardt, 1989). Overall, I identified eight practices that were common across the two cases and had a direct impact on building positive joint firm-community identity. The practices were grouped into two categories based on the effect they had on community members' social identity. Table 16 provides examples of the data as well as the first-level themes that were used for identifying the eight practices.

Table 16: Data analysis to derive community management practices

Observations/reported activities examples (max. 3 per case)	**Identified theme**	**Practice**
TL: Company tours for community members (obs.) TL: Providing work space to visiting community member (int.) TL: Family reunion (community) meeting organized and hosted at HQ (int./obs.) LM: Company/factory tours for community members (obs.) LM: Community members sitting in on a weekly staff meeting (obs.) LM: Monthly open house event at the factory	No secrets - community members welcome inside the firm	Open house policy
TL: Broadcasting visiting music band to community (obs.) TL: Sharing pranks in the company with community (obs.) TL: Video about employees' dogs playing at the office (blo.) LM: Webcasting building of first car (int.) LM: Sharing development progress of 2012 Rallyfighter (obs./blo.) LM: Drive video of first tandem car on test track (blo.)	Sharing 'daily life' inside the firm online	
TL: Discuss retailer involvement on the blogs (int./blo.) TL: Sharing Gap decision with community first (int./blo.) TL: Explaining change in cotton and shirt prices (int./blo.)	Discussing business decisions & explaining to community	
TL: Post jobs on the community blog (int.) LM: Email specific community members to invite applications (int.)	Searching inside community	Hiring from the community
TL: Signalling to look for a job in the firm to interested community members (int.) LM: Community manager discussing potential to employ member with CEO (obs.)	Efforts of placing members	
TL: Hiring programmer from the community (obs.) TL: Career from member to shop assistant to community manager (int.) TL: 'Superstar' designer hired from community (int.) LM: Intern program for community members that are students (obs.) LM: Community manager hired from the community (int.)	Hiring community members	
TL: Community feed constantly open on employees desktops (obs.) TL: Employees using lunch break to comment on designs (obs.) TL: Employee setting goals for himself how many designs to score (int.) LM: Production engineer creating blog post about own car project (obs./int./blo.) LM: Engineering intern posting his vehicle project on the community (obs.) LM: Inhouse designer redesigning sketch for community member (obs./int.)	Participation by employees in community	Community involvement across the firm
TL: Special staff label to mark comments by employees (obs./int.) LM: Badge on profile to show as employee (obs.)	Signalling employee activity to community	
TL: Special prize to recognize firm employees most active in the blogs (obs.) TL: Trial of dedicated time for employees to spend on the blogs (int.) TL: Internal update of what happened in the community (obs./int.) LM: CEO encouraged employees to participate during weekly staff meeting (obs.) LM: Prize for best employee community participation announced in meeting (obs.) LM: Introduction to community session for new employees (obs.)	Providing incentives & motivation for participation	
TL: Employee going on vacation with community members to Las Vegas (int.) TL: Employee staying at community members houses whilst travelling (int.) TL: Employees organising football match with community members (obs.) LM: Employees going to dinner with visiting members (obs.)	Spending time with community members outside work	Maintaining friendships with community members
TL: Employee hosting member visiting Chicago at his house (obs./int.) LM: Employee providing in-depth advice on life planning to member (obs.)	Going beyond employee duties to help members	

Cases: TL – Threadless; LM – Local Motors
Sources: Obs. – observation; int. – interview; blo. – blog

Observations/reported activities examples (max. 3 per case)	**Identified theme**	**Practice**
TL: Present only one new design per day to maximise attention (int./obs.) TL: Feature one successful member per month with a whole collection (int./obs.) LM: Introduce feature banner on website to show outstanding project (int./obs.)	Promote through own website	Promoting community members externally
TL: Name of community member on each shirt (obs./int.) LM: Badge with name of the designer on each vehicle (obs.)	Acknowledge community member on product	
TL: Make promotion of artists pre-condition of collaboration with partners (int.) TL: Profile displays of Threadless designers in Gap stores (obs.) LM: Give credit to designers in television interviews (obs.)	Promotion through external partners	
TL: Annual family reunion community meeting initiated by community, now financed and organized by Threadless team (int./obs.) TL: Sponsoring community initiated design challenges (int./obs./blo.) TL: Supporting members that visit celebrities with free products LM: Providing factory space, money and engineering resources to develop the concept of a tandem car (int./obs./blo.)	Providing resources for community members project ideas	Supporting community members' projects
TL: Monitor community members' requests to identify trends and respond (int.) LM: Split day in shifts for community managers to watch community (int./obs.)	Following community trends	Responding to community wishes
TL: Enable collaboration of designers on the website after increased use (int./obs.) TL: Publish voting statistics only one day after community request (int.) TL: Create critique section as blogs were used for design critique (int.) LM: Introduce CAD tool to support work of engineering community (int.)	Fullfilling community's wishes	
TL: Founder's role to ensure community perspective is reflected in decisions (int.) LM: CEO's 1st priority is supporting and developing community (int./obs.)	Community as management priority	Top management active in community
TL: Founder votes and comments on new designs (int./obs./blo.) TL: Founder conciliates conflicts between community members (int.) LM: CEO comments on community members submissions (int./obs.)	Community participation	
TL: Founder invites community members for BBQ to his house (int.) LM: CEO welcomes new members to the site (int./blo.) LM: CIO calls member to him with a problem with the site (obs.)	Showing appreciation for community	

Cases: TL – Threadless; LM – Local Motors
Sources: Obs. – observation; int. – interview; blo. – blog

5.5 Results: Creating positive social identity

In the following sections, I demonstrate how these firms created and maintained a positive joint firm-community social identity that essentially made community members feel part of the firm. I first present evidence of positive joint firm-community identity as well as evidence of increased engagement. I then focus on the eight empirically-derived practices firms employed to create joint social identity. Figure 4 summarizes the overall model resulting from my research, which I will motivate in the following sections.

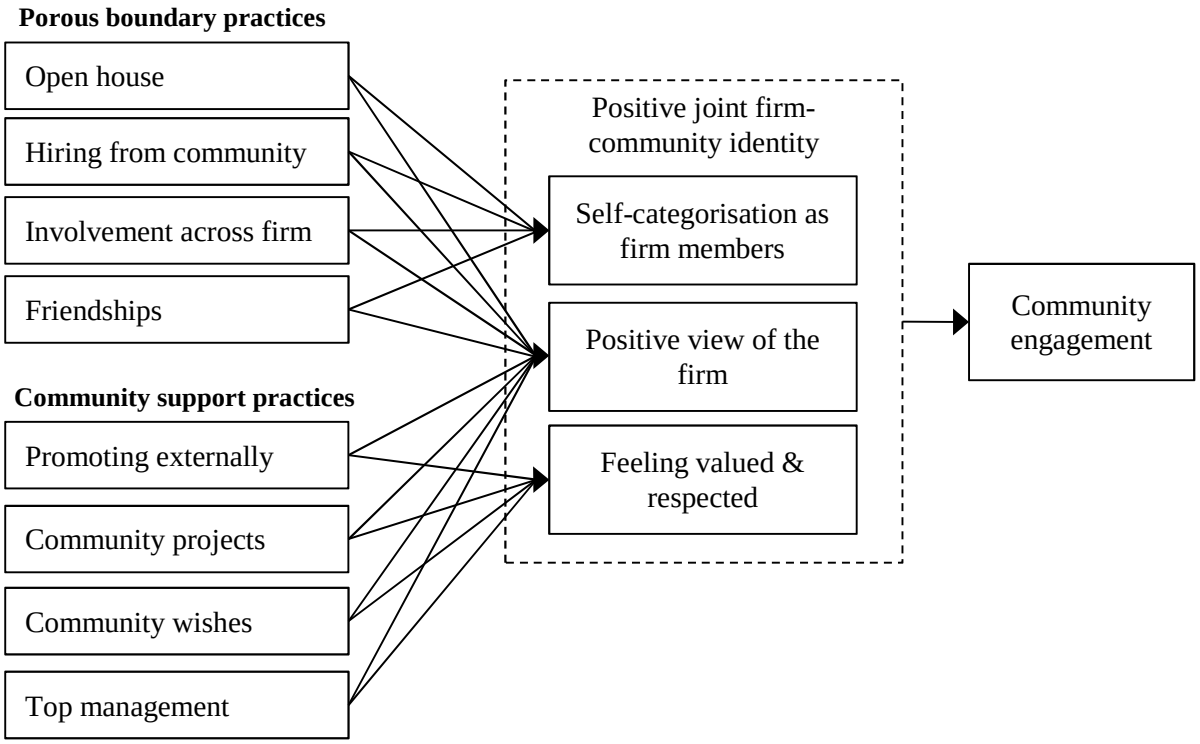


Figure 4: Community management practices creating engagement through positive joint firm-community identity

Positive joint firm-community identity

For both cases, I saw evidence that community members developed a positive social identity leading them to identify as members of the firms. Both firms were successful in creating a social identity that spans both the firm and community, as is

outlined in Table 17. I see evidence of this in several ways. First, many of the community members refer to themselves as firm members. For instance, an active community member on the Local Motors online community described his experience of developing vehicles with the firm-hosted community. He felt proud of being 'part of the company' even as a community member and he related his involvement as such:

> "And I am going to be a part of the company, where we are kind-of design and physically make these [cars]…Some of us just started to do it as a hobby, it is not like you get to do that all the time. So it is extra special" (Local Motors community member).

Community members at Threadless similarly described feeling as though they were part of the firm. One member described how "there seems to be not really a boundary between the community and the company". An employee of the firm, who worked as a community manager, also outlined similar sentiments: "Jake [the founder] is always on there [forum]; we are always asking people, it kind of comes back to that they feel like they are part of the company because we are listening to their concerns about doing all our policies based on what they want".

Following Ellemers et al. (1999) who argue that a social identity that leads to engagement goes beyond self-categorisation, I also find strong evidence for a positive view of the firm alongside community members feeling valued and respected. Community members generally held a very positive view of the firms, emphasising how the firms felt different from other business they had experienced before:

> "The two Jakes [founders] playing around, two really-really lovely guys who just started to build this business model, and then they obviously in return employed their friends or people similar-minded; and I think that the company has just grown up like that. You know, I mean they're nice, they're real people, they're not a corporation…" (Threadless community member).

Similarly, community members emphasised how they felt valued and respected by the firms. They described the closeness with the firms and how they sensed that the companies cared about them. Some went further to suggest that company employees seemed like similar people, even friends. As one community member at Threadless related, “It’s almost like, I don’t know what it’s there, but you get the feeling everybody is just the same as you, and you are just one of them-you know what I mean? Kind of almost feel like they were your friends, although that’s their job. It’s strange!”

All this evidence suggests that community members have a positive social identity that makes them feel part of the firm and emotionally involved with it. Such a positive social identity will lead to engagement of community members for the firm (Tyler, 2001).

Indeed the interviews with community members provide evidence of this effect:

> “If Local Motors called me up today and said, we can’t pay you for this. But could you go to the next county over, there is a manufacturers’ meeting, there is a car show there. Could you go over there and represent us for the whole day. We not going to give you a cent for it, but if you could go over there we would appreciate it! I would do it because I feel so much a part of the company” (Local Motors community member).

Similarly, Threadless community members link their relationship and experiences with firm employees to their participation in, and contribution to, the firm’s product development:

> “If Jake [the founder] didn’t convey himself as such a nice guy and such a guy who seems to care about the community, I don’t know whether people would submit. Certainly the people behind Threadless all seem real decent and cool people […] So if it wasn’t for those people then you would think twice about submitting” (Threadless community member)

Table 17 provides evidence for both cases on the positive joint firm-community identity.

Table 17: Evidence of positive joint firm-community identity and engagement by community members

	Threadless		Local Motors	
	Employees	Community members	Employees	Community members
Self-categorisation of community members as firm members	"The company is not just run by the employees, but really it is run by the whole community which includes the employees, but also includes all these people outside" (Top management)	"Before I was listed as an ambassador, I was a kind a goodwill ambassador with Threadless because I love the company and I love being a part of it"	"When I was just a community member…I felt a strong human connection to the firm because of the comments of the CEO and the personal emails I received from the manager"	"And I am going to be a part of the company where we are kind of design and physically make [cars] […]. Some of us just started to do it as a hobby, it is not like you get to do that all the time. So it is extra special"
Community members' positive view of the firm	"I worked with a lot of other companies and I never felt like I am working with someone that is an artist or a friend. Threadless [before I was hired] always felt like these are my friends.."	"And they try to make it fun for people, and they're very ethical. They're a business and, successful. But at the same time, I trust, I trust them which is a big thing. 'Cause, a lot of places are kind of shady "	"You have to give more than you take in a certain way. If you are only running things that make people [community] feel that you are making money on their back, they will just go away"	"One of the big differences is that here is an online forum and interactive community that is not just hosted by a company but the company invests their time and their people…"
Community members being valued and respected by the firm	"We [in top management] take serious input from the community about business decisions and strategic decisions that we make. You need to take the community members' point of view into account very strongly when you are making business decisions"	"It was an incredible experience. And it just gave me this feeling, that I was really appreciated, you know. And I think that's a lot to do with why Threadless is so successful is they really, they really do seem to try to give to the artists"	"[Before I was hired] I was gone for 2 months and [an employee] reached out: "Hey, what happened? Where are you?" That reach out from her was really: 'Oh, I count for something?' That is nice"	"I guess with all the competitions that I participated in, they pulled out all the stuff to make sure I got the recognition that I deserved even though I was under 18. They also put together packages with various merchandise to make sure that I didn't feel taken advantage of"
Engagement effects of social identity	"[Having our employees involved in the community] helps our business because people feel loyal to the people they know here"	"[The firm is] very interested in the artistes…So I really love those people…I think that's what draws good people to the site."	"[When I was hired], essentially I was getting paid to do what I would do on Saturday mornings and in the evenings… exactly what I did previously in the community"	"I try to always help out with the site where I can, or if there's something interesting I try submit something to it, just to show that I'm working and helping"

As community members felt part of the firm, they could become active in promoting new innovation directions. For example, in 2011 at Local Motors, a community member posted the idea for the tandem project, a vehicle where the single passenger sits directly behind the driver. Community members became excited, seeing it as a chance to develop a Local Motors community vehicle they might own: for most members the first Local Motors car, the Rallyfighter, was unaffordable. This resulted in the idea to create a kit that any community member could use to build the Tandem vehicle for about $10,000. Their close relation with the firm meant that community members could express this proposed innovation to community managers and top management. Top management at Local Motors decided to take on this project and provide resources to develop this concept car. Over the next nine months, Local Motors and the community worked on the project. In autumn 2012 the first Tandem vehicle was presented by Local Motors at the SEMA Automotive show in Las Vegas.

Practices for creating positive joint firm-community identity

Social identity is an individual state. Each individual decides what groups they are part of and how he feels about these groups (Hogg, 2006). Consequently, social identity can only be influenced on an individual level (Ellemers et al., 2004). The firm practices I present affect individuals' perception of, and feelings towards, the firm. Figure 5 summarises the way the firm-community identity is created. New community members join the community with a social identity already in place. With their original social identity [level 1 in the illustration] they might feel part of their university or company, for

example. If the new member is active in the community, for instance through participation in blogs, they start to feel part of the community [level 2]. Being active in the community, the new member notices and experiences the eight firm practices I describe below. These practices establish that the firm is open to the community, supports the community, and values its members. As a result, the member no longer only feels part of the community, but the member may start to hold a positive view of the firm and, indeed, feel part of it, creating a joint firm-community identity [level 3]. As previous research has shown, positive social identity leads to increased willingness to contribute to an organisation (Fielding & Hogg, 2000). Similarly, community members feeling joint identity with the firm are more likely to contribute to the firm. As the joint-identity results from the view of, and feelings towards, the firm that the practices create, as long as the practices sustain this view of the firm as open, supporting and valuing members, the identity is sustained. While the practices I will outline affect the social identity of an individual member, the practices sustain the contributions of the community as a whole. Community membership is not stable (Shah, 2006). Some community members leave while new ones join. Creating joint firm-community identity for new joiners leads to sustained contributions when considering the community as a whole.

Two sets of firm practices create the joint firm-community identity. The first set of practices are what I call ‘porous boundary’ practices: those that make community members feel part of the firm. The second set of ‘community support’ practices emphasise how much the firm values community members and their contributions. The eight practices across these two sets are summarized in Table 18 and will be discussed in turn.

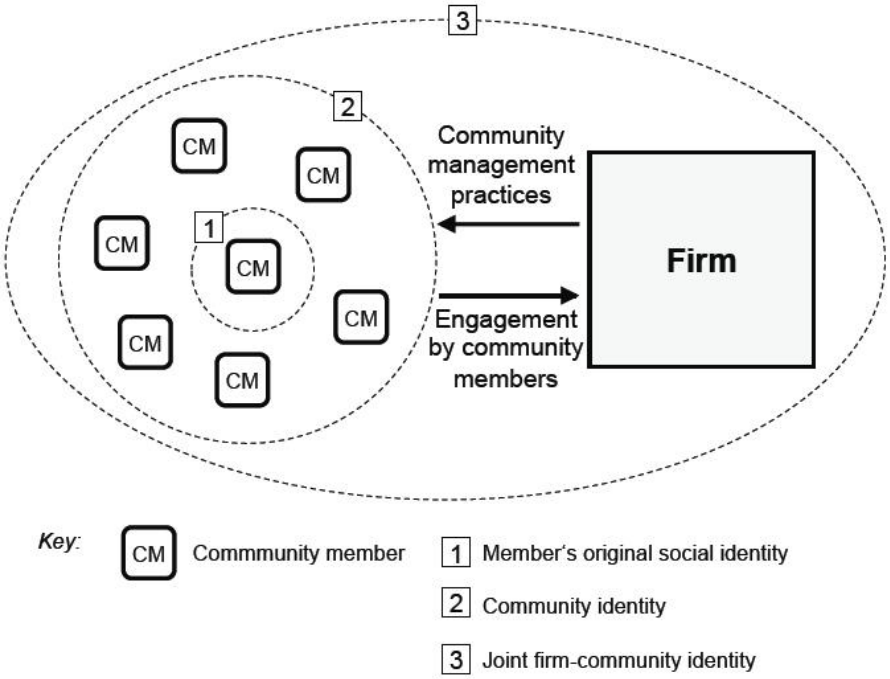


Figure 5: Levels of a community member's identity in firm-hosted communities

Porous boundary practices. The minimum condition for creating a joint firm-community identity is self-categorisation: community members must feel there is a porous or blurred boundary between community and the firm, and that they can identify as being part of the firm. The following four practices support the feeling of porous boundaries.

First, in both cases there was an "open house" policy. Both companies put great effort into sharing with the community what happens inside the firm, such as through using video teams that regularly produced footage of what was happening inside the walls. For instance, when Local Motors built the first prototype of the Rallyfighter, they broadcast the process via webcam to their community.

Table 18: Evidence of practices supporting positive joint firm-community identity

	Threadless case data	Local Motors case data
Porous boundary practices		
Open house policy	*Source:* Firm interview, community interview, observation & blog data *Example:* Every day community members dropped into the firm and got tours by employees. It was common for them to spend part of their day there and have lunch with staff. (Observation, September-October 2011)	*Source:* Firm interview, community interview, observation & blog data *Example:* During a weekly employee meeting the CEO encouraged all engineers to share the work that they were currently doing in updating the Rallyfighter for 2012 with the members of the community e.g. the new dashboard. (Observation, "Stand-up" employee meeting 24th November 2011)
Hiring from the community	*Source:* Firm interview, community interview, observation, internal documents *Example:* "Alex works there now, he is a very famous designer there, he still chats with everybody and he tries to strip away much of the bureaucracy of it and it is very much about the people to get awesome products and be a creative community". (Community member)	*Source:* Firm interview, community interview, observation *Example:* "Jay [CEO] or […] contacted me and said: 'We are considering hiring a designer within our team'. They contacted specific designers from the community. They had a list of five or ten designers that they considered interesting and so yeah, I've been the lucky one". (Employee)
Community involvement across the firm	*Source:* Firm interview, community interview, observation & blog data *Example:* ""I really like how the staff there, they're very hands on. You know. You got a chance to speak to Jake. But it's like, it's really cool. I've never had an experience before where, you know, the staff that communicate with their members"". (Community member)	*Source:* Firm interview, community interview, observation & blog data *Example:* "I have got my own personal projects up there [the community] like my gear box up there, I have got stuff that I work on, some suspension type stuff that I designed. It is different engineering, design, fabrication kind of projects that I have put up there". (Employee)
Maintaining friendships with community members	*Source:* Firm interview, community interview, observation *Example:* "I don't know, we just become really good friends with a lot of people [community members]. I think I might be taking a trip out to LA with a group of them to spend a weekend at Disneyland." (Employee)	*Source:* Firm interview, community interview, observation *Example:* A community member turns to a for community manager for advice on personal problems and career development. The manager takes a lot of time to help him in very personal emails. (Observation at LM headquarter, 15th March 2012)

Table (Continued)

	Threadless case data	Local Motors case data
Community support practices		
Promoting community members externally	*Source:* Firm interview, community interview, observation *Example:* "When we first started there would always be like people asking like why don't you just focus on one artist like highlight someone and I mean finally it became true and I think there is so much more opportunity especially if you get featured. I think it's a huge deal for any artist". (Employee)	*Source:* Firm interview, observation *Example:* The CEO emphasized that taking on new projects with Shell, Peterbilt and Domino's would be great for the community to develop and showcase their skills to people beyond the community as well as receive recognition. (Observation, informal talk, 29th March 2012)
Supporting community members projects	*Source:* Firm interview, community interview & blog data *Example:* "More and more when people make use or make challenges and a lot of people participate, Threadless sees this and actually incorporates it into their newsletters and makes it more official". (Community member)	*Source:* Firm interview, observation *Example:* The CEO describes how the community got excited about the Tandem project, so he decided to go ahead and fund the project by sponsoring a donor car as well as having one of his engineers coordinate the effort. (Observation, informal talk, 13th October 2011)
Responding to community wishes	*Source:* Firm interview, community interview, observation *Example:* "I myself have experienced how they're kind, they really are—they'll bend over backwards for people and they definitely…they do care about their community. I think like any company they're driven by bottom-line but I sense that they're much more caring than a lot of companies I have interacted with". (Community member)	*Source:* Firm interview, community interview, observation *Example:* "The guys at Local Motors are really willing to work with the community to improve the evolving systems so in that respect they really bend over backwards to fill the extra hours to make sure that everything functions appropriately and that everybody is satisfied with results". (Community member)
Top management active in community	*Source:* Firm interview, community interview, observation & blog data *Example:* "Well, the guys and even Jake [founder], I mean Jake is still at the top and he's - you see him making comments from time to time in the communities and even on the individual designs, so his participation is like really down there and I'm sure he's an incredibly busy man but he still does take the time to really listen to individuals". (Community member)	*Source:* Firm interview, community interview, observation & blog data One community member described how he had "a project called Bamboo--a car made of bamboo" which he didn't expect to get any notice but which solicited comments from the CEO regarding how it would work as a chassis.

Another example of the "open house" policy was the use of staff blogs in which they shared fun things that went on inside the firm. As a typical example, one of the Threadless staff members, a very talented artist, created a blog post in which he drew caricatures of key employees of the company with an explanation of what these different people are doing. He explained: "I did it just because before I started working here, I would always be like, 'I wonder what he does here?, like: 'Who is that person?' I feel a lot of the community felt always like this, so I was, like, maybe I will draw them and then explain what they do, real quick." The companies also shared strategic information with the community. For instance, before Threadless publicly announced its collaboration with Gap, they shared this information with the community on the blog. Top management attributed great importance to this form of openness:

> "I think you have to be very open and transparent. You need to immediately and genuinely sort-of come clean when you make mistakes and apologise. I think a lot of the things that make for good general business are more pronounced and enhanced when you are a community-based business. If you want it to be successful you are going to have to make that decision: are we really willing to open up and be much more transparent? That's what we do with this community" (Threadless top management).

This openness also included being open to visitors from the community who would typically get a tour of the whole company by a member of staff. For instance, at Local Motors I observed community members visiting who were given the option of sitting in on the weekly staff meeting in which internal company problems and successes were discussed. Having a community member present seemed unremarkable to employees. The result of such openness is that the boundaries between the community and the firm blur and community members consider themselves part of the firm.

A second important 'porous boundary' practice was that both firms actively hired from the community. Many of the employees who either had community management positions, or positions related to design, came from the community. As a result, community members recognized that there were many of the same type of people inside the firm as they were, which is an important step in developing a joint identity (Ellemers et al., 2004). One of the most successful designers, now a Threadless employee, related that the community members' view was that "They love that we are working [inside the firm, and that] this is legit'!"

Indeed many community members aspired to work for the firms:

> "They have a company that would be extremely fun to work for, very laid back people, and they're young, you know. They're our age. […] You know if they were just bringing in ringers all the time who had never gone through the community at all, then I think that the authenticity or the experience would be diminished…".

As a third important practice, I found that in both companies a large share of the employees were active in the community. I noted employees from across departments—not only those on a community management team—regularly contributed to blogs and forums. Both firms actively encouraged employees to spend time in the community during their working hours. A summary of some evidence is given in Table 18.

Community members felt that knowing many staff members through the blogs and forums made the whole firm feel less like a traditional company. As a community member related, "Jake [the founder] and then obviously all the other guys that work there as well…they will all participate, so it's almost like it doesn't feel like they're firm or a company". An employee described the relationship as: "They [the community members]

know us personally, especially their core group of members, so it is almost like we treat them like friends".

The maintenance of friendships was the final practice that helped to promote the feeling of porous boundaries, as I also highlight in Table 18. Both firms regularly held meet-ups, where community members mixed with employees. Observing these meetings, it was hard at times to tell who was an employee and who was a community member. They knew each other by name, played games together and then later went out to clubs and partied together. I heard accounts of employees going on vacation with community members and staying at community members' houses when they went abroad.

All of the above practices led to multiple interactions, relations and exchange of information between employees and community members. As a result, they contributed to the self-categorisation of community members as part of the firm, making the boundary between firm and community porous. In figure 4, I illustrate the main effects of these first four practices.

Community support practices. An important factor for developing a positive joint social identity is the way individuals are treated (Tyler, 2001), contributing to status-judgement and emotional involvement with the firm. Community support practices were those that I found helped turn what could be a neutral social identity into a positive social identity.

The first practice of this type was in promoting community members externally, as I illustrate in Table 18 and with examples that follow. At Threadless, my interviews pointed to how the firm would try to promote the most successful designers, those they

referred to internally as ‘artistes’. For example, a top manger related that, “…the fundamental way Threadless works [is] how it’s just about promoting individuals’ artwork”. Promotion took place in different forms. For example, each Local Motors vehicle came with a badge that carried the name of its designer. T-shirts produced by Threadless had the small Threadless label paired with a larger label featuring the name of the designer. As one designer related:

> “And yeah, that’s another thrilling part of being printed is like knowing your name’s on it and the people know who you are and they can be wearing it. That’s, you know, instead, instead of just – you go to a place like, like Urban Outfitters or something. You buy a T-shirt, you don’t know who made it. And it, it has another significance really”

Furthermore, the companies used their websites to promote artists. For instance, every weekday Threadless brought out one new T-shirt design. They only introduced one shirt per day to give each artist the attention they deserve. As a member of the top management team explained how they are now careful “to properly feature everybody” who has one. They had moved from a model where they might release up to ten designs a day but the founder reflected that with “ten designs and it’s overwhelming nobody gets the spotlight. That’s why we switched to just the one featured shirt to make it consumable for our customers”. While it has been researched that recognition and status are of great importance to community members (Lakhani & von Hippel, 2003) and help to drive participation in online communities (Von Hippel & von Krogh, 2003), I found that not only does gaining status help drive participation directly but it also supports viewing the firm favourably and fostering mutually beneficial status judgement and emotional involvement.

A second practice that was common across the two cases was that the firms invested in community members' projects that had no direct impact on the main business. I highlight some examples in Table 18. For instance, at Threadless community members could run their own challenges. Typically one community member came up with the theme, such as "make a design using only three colours." The purpose of such a challenge was the opportunity for community members to improve their design skills. In many cases, the company then became involved, such as supporting a prize for the best designs.

Similarly, Local Motors invested in projects developed by community members. For example, in 2011, one community member came up with the idea to have a contest focused on building a "tandem car." Community members were excited about the project, and Local Motors bought the necessary materials, provided floor space in the factory, and employed an engineering intern to manage the project with the online community. One community member reflected "I think it's the fact that they constantly think about the people. It's all about the people; it's all about the community. They are really focused on that making sure that enough creative things go on and are keeping it interesting". This investment helps to drive emotional involvement that supports positive social identity.

A third important practice was being responsive to the community. Both companies had built up a community department focused on working with the community. I observed that if they sensed new wishes or dissatisfaction in the communities, they typically reacted quickly. A community manager at Threadless outlined their role as such: "I mean we have whole department dedicated just for this; it is not just marketing, it's interacting with the community really. We are the lifeline." This effort appeared appreciated by community members who sometimes expressed surprise at

the response. A typical example at Threadless was how they made scoring data available to the members after they asked for more information:

> "A year and a half ago, when people were talking about wanting to know more about how Threadless selects the design, and about like stats and stuff like that, Jake [the founder] said, 'Okay, we'll show them the skinny [raw] stats'…He just made a decision then and, like, later that day, a huge piece, a huge chunk of what Threadless uses for their selection, they made it available for us to see. I mean, I thought it was really, like, just, 'Wow!'" (Threadless community member).

The above quote alludes to a final practice that affected community members' perspective on the firms: top management that was active in the community. In both firms the founders were still active community members, even after many years. They blogged on a regular basis, communicated with community members, and commented on submitted designs and ideas. As Jake Nickell, the founder of Threadless mentioned, "I go to the forums myself and comment a lot, and even though there is not an issue I'll get involved sometimes". Community members were aware of the involvement by top management and appreciated the engagement with the community. One member of the Local Motor community related:

> "So I decided so that morning instead of drawing, I was gonna create my profile on Local Motors. So, I took the time and I made a profile and fill out all my information and an hour after making my profile, something like 7:30 in the morning, I got a response from Jay; a direct response from Jay where he was like, 'Wow, you look like a really interesting character. Welcome to Local Motors. We're really excited to have you on board.' To get that message directly from the CEO, I was shocked. I was like…at first, I didn't know who Jay was when I started looking on the site and I found out he was the CEO and I was like, 'Wow, I got a message directly from the CEO.'"

Overall, all the practices I have described above help the firm to convey a sense that they support the well-being of the community and its members. Community members reported feeling valued and respected and held a positive view of the firms. As a result,

members developed positive joint firm-community identity, leading to continuous contributions to the firm.

Sustaining joint firm-community identity

The joint firm-community identity is based on the fact that community members feel valued by the firm and believe that their interests and values are aligned with the firm. If the firm and the community are stable the practices shown above work well in creating and sustaining the joint firm-community identity of members. So long as the firm does not change its business model, these practices will ensure that community members continue to identify with the firm. Nevertheless, if the firm changes its strategy these practices become even more critical. In these situations, it is important to maintain the openness of porous boundaries to the community to make them feel part of the change. Community support must then demonstrate that after the change community members will still be valued by the firm. Otherwise there is the risk that community members will not understand the change and perhaps interpret it as going against the community. They might then feel excluded from the company. To avoid this and maintain the joint-firm community identity, the firms employ the practices to maintain the identity. During my research, both companies made changes to their strategy in order to grow their business further. Local Motors, while originally focused on car design, increasingly started to work with engineers. It launched a new web platform and support tools which included a CAD software tool geared towards the needs of engineers. Threadless started to develop lines of T-shirts that would exclusively be sold through Gap stores across the United States.

This was a major change to their business model, as for the first time community members were no longer designing for Threadless, but for another retailer. This move had further complications as Gap, for a lot of community members, stood for old established unresponsive corporations that they did not like. Nevertheless, the two companies handled the change differently. While Threadless employed their community-based practices consistently, Local Motors struggled to interact. This mistake affected the community's engagement for some time afterwards.

Threadless involved the community in the decision process from the start in line with the 'open house policy'. Before Threadless started to talk to retailers Jake, the chief community officer and founder of Threadless, involved the community on the forum. He wrote a blog post and asked the community what they would think if Threadless' products were sold through other retailers. Furthermore, he asked them what retailers the community members were happy to see their products in. Community members suggested that they would not like to see their products in Target (a lower market US retailer of household goods, clothes, and groceries), but were happy to see them in other clothing retailers, like Gap. In line with the 'responding to community wishes' Threadless took their opinion on board. At the same time, the fact that top management consulted them, made members feel valued. They therefore appreciated their role in decision making:

> "Jake will often like post a blog in the community. And he'll ask for help. He'll ask for opinions, right? Um, he's done that really recently wear it, where, he'll just, like with his partnership, his partnership with the Gap. Like he posts about that. And he explains why he's doing it and why he thought it was a good thing. And you know what? They take the feedback seriously" (Threadless community member).

Through using these practices, the community not only accepted these changes but also believed that they had actively shaped the course that the company decided upon. As a result, the changes become part of the joint firm-community identity:

> "If you are in this kind of environment it makes you feel like you are listened to and you are part of something more not just the community, but you can actually affect, if you have a good argument, you can actually affect the direction of the company or at least influence something" (Threadless contestant).

Involving community members in changing and developing the company is an integral element of the company development process at Threadless as a top manager explains:

> "You start out with I think ideas about what is right for the community and then you validate those ideas by having conversations with them either formalised survey type of conversations or informal ones on the blogs. Like you see Jake sort of blogging and asking people about key decisions. Like a key decision I think that we had to make was do we work with a large retailer. And Jake went on to the community blog and asked them if … asked the artists what they would think about us selling through large retailers. Most companies would make that decision without previewing it publicly to the community and without taking the community's feedback seriously and making that decision ultimately. So I think in addition to the creative inputs, there's actually business inputs. And those business inputs are actually very valuable and, in many ways, I think vital because if the business direction of the company ultimately does not meet the needs and interest of the community then everything starts to break down".

As this quote shows, Threadless top management views losing the joint firm-community identity in the process of changing the company as a serious threat.

Threadless not only involves the community in the strategic decisions, but also communicates the decisions to expand as a way of further 'promoting community members externally'. They explain that, by working with a retail partner like Gap, community members can see their ideas and name spread more widely:

> "The two things I'm most excited about are products and partnerships in terms of bringing more opportunities to the community. So I think all the partnerships we have coming out are going to be huge for the community, huge for the artists getting their name out there. And the new product canvasses, I think there's some of them will be distributed elsewhere; some will be distributed through us" (Threadless top management).

Clearly and frequently communicating the benefits from the community perspective makes the decision also part of the community members' identity.

In contrast, Local Motors needed a lot of its resources for the redesign of their community platform. As a result of this demanding project, they did not carry out the community engagement practices, particularly with regards to openness and responding to the community, as before. Local Motors made its decision about the redesign of the community platform and about including more functionality for engineers mainly internally without involving the current design community in the process or communicating the benefits widely to the community. The failure to implement an 'open house policy' meant that community members felt that "They should have told us more!" Design community members felt alienated. They were unsure whether, given all the changes towards engineers, the firm still required designers. "I tried to explain to some of these other members: It's not that it's an engineering based site, it's just geared towards engineers being able to have a say" (Local Motors community members). Designers suspected that they were less valued by Local Motors and thought that the company was not 'responding to community wishes'. They therefore no longer considered themselves part of the firm:

> "What's upsetting about that is the design community is what made Local Motors a living, breathing work space. And so for us to not have our voices heard that was

kind of hard to take, that was kind of a gut punch upon that transition from Local Motors to Local Forge" (Local Motors community member).

As a result of this change, engagement of the design community on the site temporarily died down and many of the design community members left. "It [design community] is very, very dead right now because of our website and what we did with our website and how that was bad for the community" (Local Motors community manager).

The perception of the lack of openness and responding to community wishes challenged the community members' joint-firm identity. Other practices, however, helped the company to recover their standing in the community eventually. The 'community involvement across the firm', 'hiring from the community' and 'friendships with community members' had previously established a strong bond between employees and the community members. Using these relationships, Local Motors subsequently explained the changes to the design community and also incorporated more of their wishes. Local Motors signalled through big design contests that the community was very much still about automotive design and that designer community members were valued part of the firm. Many designers came back to the community.

5.6 Discussion

Firms are increasingly looking to use on-line communities to generate external ideas, and I had the opportunity to examine two firms that served as focused cases of how such communities might be managed. While many on-line communities fail to last as a source of ideas (Iriberri & Leroy, 2009), the firms I studied had created and sustained

communities that provided an flow of valuable ideas over the course of many years. By examining these two firms and their communities, I was able to explore an important question in innovation management: if external ideas sourced from communities can provide value to firms, how can firms provide the right environment that encourages on-going and high-quality participation?

In the past there have been two main areas of research focus on how firms may encourage participation in online communities. First, merely by hosting an online community where members can interact, a firm provides implicit incentives to members, such as learning and skill development (Von Hippel & von Krogh, 2003). However, such incentives may not be enough to foster sustained engagement after members complete an initial learning process. Secondly, a firm can provide extrinsic incentives, such as firm recognition (Jeppesen & Frederiksen, 2006) or monetary rewards (Boudreau et al., 2011), though these rewards become less attainable individually as communities grow, creating a challenge to sustaining the engagement of communities.

To these two prior main areas of focus, I emphasise the role of positive joint firm-community identity in sustaining participation, an under-researched area of innovation management. In doing so, I make several contributions to the literature on the management of innovation, specifically on how to manage the external flow of ideas.

My first contribution is to use social identity theory to better understand the relations between firms and innovation communities; in doing so, I answer a recent call for further research in understanding interactions at the boundaries of firms and communities (O'Mahony & Lakhani, 2011). While prior research has established that shared social identity is important in driving an individual's engagement with

organisations in which they are formal members (Ellemers et al., 2004; Tyler, 2001; Tyler & Blader, 2000), I inductively extend such research to show how firms create joint firm-community identity for external community members. While a prior focus has been on how social identity might act on either communities or firms (Nambisan & Baron, 2010), I demonstrated how to form joint social identity.

Secondly, I extend past efforts that looked at broad motivations for participation in communities (Porter & Donthu, 2008) to develop eight specific firm-level practices that can create and sustain positive social identity between firms and communities. I inductively derived a set of practices that can ensure that firms are best positioned to sustain a flow of ideas from members of communities. These practices involve making the barriers between the firm and the community permeable. This work addresses the specific practices of an "innovation partnership" that Nambisan and Baron (2010) have described as important for fostering links between firms and communities.

Thirdly, in contrast to previous research on user communities (Jeppesen & Frederiksen, 2006; Nambisan & Baron, 2009, 2010), I have examined how firms can engage firm-hosted innovation communities that are specifically established for generating and sharing ideas. Innovation in user communities is often a by-product of lead users trying to satisfy their needs through product modifications or extensions (Franke & Shah, 2003; Hienerth & Lettl, 2011; Schreier & Prügl, 2008). The communities I looked at were not user communities, but communities dedicated to the creation of innovation for Threadless and Local Motors. The community members I interviewed were not lead-users: They did not innovate because they had a need for the product, such as being dissatisfied with current T-Shirts designs or with their current car.

They innovated because they were creative people who loved to create designs or cars (Füller et al., 2008). My research suggests that for these innovation community members, feeling part of the firm is an important motivator as it also makes them more integral with the innovation activity for which they joined the community in the first place.

My fourth main contribution is that I help differentiate what may be expected between different types of external sources of ideas. I looked at firms that rely wholly on a flow of external ideas. Most firms will use firm-hosted online communities as just one approach within a portfolio of internal and external innovation options, such as Dell's use of a firm-hosted community for sourcing external ideas while maintaining an active internal R&D organization (Bayus, 2013). As a further example, a consumer goods company might adopt a portfolio of three internal and external innovation methods. First, internal R&D might focus on the development of formulations for new washing powder. Second, the firm might use broadcast search, using a site like Innocentive (Jeppesen & Lakhani, 2010), to seek out new technical solutions to low-temperature washing that had been challenging to solve. And third, the firm might use a firm-hosted on-line community to ideate in the area of new packaging ideas for laundry products.

As highlighted in this example, firm-hosted online communities using repeated innovation contests like the ones I studied, are more useful for certain types of innovation and less useful for others. Since they rely on repeated interactions among a community, they are best for innovations which draw from a common set of skills or expertise. They are more likely to provide beneficial advances within incremental areas of innovation, whereas "broadcast search" among disconnected individuals is more appropriate for seeking out radical innovations (Jeppesen & Lakhani, 2010). There is also a difference in

how to value individual contributions when comparing firm-hosted communities and broadcast search. Within the context of broadcast search, once an individual has contributed a perspective, that individual is less valuable to the firm (Bayus, 2013). With firm-hosted communities, repeated participation by members, who help to develop the work of others, is valuable.

While a joint firm-community identity can be valuable to encourage engagement by a community, it can also lead to path dependency of strategic direction between firm and community. Organisational identity is described as that which is "central, enduring, and distinctive" about an organisation's character (Albert & Whetten, 1985). In firm-hosted online communities, joint firm-community identity provides shared beliefs and values (Ouchi, 1979). The resulting identity cannot be exclusively controlled by the firm, as the firm and the community define together what is central, enduring, and distinctive about their combined efforts. Indeed, organisational identity can serve as a barrier to change (Fox-Wolfgramm, Boal, & Hunt, 1998) which could be a challenge for innovating companies that may seek to break with past directions.

Even though joint firm-community identity could provide a constraint to firms, I described empirically how there were some new strategic initiatives that arose from the community. These ideas were catalysts for change, such as the Local Motors experience with the tandem car concept. Even though I expect, on balance, firm-hosted communities to provide more incremental innovations than broadcast search, there could be times during which communities advance change. Future research could look at how firms that are successful at creating positive joint firm-community identity deal with major changes in strategic direction whether initiated by firms or communities.

Looking at the practices that I have identified it becomes evident that part of creating social identity and making the online collaboration between the firm and the community successful is making a closer connection between the two. This happens in two ways. First, the business practices of Threadless and Local Motors show that breaking down the distance and anonymity of internet interactions is vitally important in creating closeness. Offline meetings like the Threadless family reunion or on-site company tours play a central role. Secondly, these practices must highlight similarity between the firm and the community and avoid and a binary "them" and "us" perception. That employees are community members too, and that community members can become employees, demonstrates to community members. Furthermore, the community is collaborative and as such based on values of contribution, collegiality, concern and honesty (Adler & Heckscher, 2006). The practices that I have described show that the firm shares these central community values. For instance, sharing information openly and proactively with the community reinforces the idea of honesty. The community support practices I have presented show the firms' concern for the community. The friendships that occur, and the job opportunities that emerge, reinforce this sense of collegiality.

The eight practices that create joint firm-community identity have been identified in two smaller firms with less than one hundred employees. This raises questions to what extent these practices could also be employed in larger firms or when the firms grow. Some of these practices can be more easily scaled and thereby sustained. For instance, the open house practice is about sharing information openly with the community and welcoming the community inside the firm. This seems also be feasible with a larger community and firm as long as the underlying culture of openness to the community is

preserved inside the organization. In contrast, top management involvement could become more difficult as the firm grows. With increasing complexity of the work and more professional outside management, managers might no longer have the time or interest to get involved. Nevertheless, more important than sustaining the actual practice is the fact that the underlying principle that contributes to creating community members' joint firm-community identity is sustained. Top management involvement shows community members that the community is important and valued by the firm and their management. Consequently, even when top management can no longer be active to the same extent in the community there are alternative activities through which the firm can signal valuing the community. Also other practices might be challenging to sustain in the same form as firm and community grow, but their underlying principles can be sustained. As firms grow they can become less flexible. As the community grows it becomes more difficult to keep track of the new developments and trends. Both these factors will make responding to community wishes more challenging. Yet essential for community members is the fact that the firm cares about the community and supports them. Consequently other forms, e.g. regularly surveying the community to find out their wishes and presenting initiatives to improve the community that are based on these surveys, are likely to have a similar effect. Maintaining friendships with community members is also going to become more challenging as the community grows. Maintaining friendships shows community members that people inside the firm are the same as in the community. It gives a face and human side to the firm and helps to develop trust. If less members have these friendships as the firm and community grow putting even more emphasis on these values in the open house practice could make up for it.

I recognise that not all members within the community are the same. Indeed, recent innovation literature is increasingly interested in how different individuals contribute differently to distributed innovation efforts, such as categorizing the patterns of 'core' and 'cosmopolitan' members (Dahlander & Frederiksen, 2012). I also note that the practices I describe work differently on different subsets of a community. Indeed, even in the communities I studied, some members would just sign up and submit their ideas without getting involved with the community in any meaningful way. As one Threadless employee put it when speaking of the community: "That 'core' of the community … they're the ones that are putting the art out, and they kind-of get into it and let themselves get immersed in it. They are what sustains us and what kind-of drives us". While I have focused on the core of communities, further work could characterize how the level of self-identification with the firm varies across core and peripheral members of the community and the differential impact of the eight practices across these members.

I designed my inductive study in order to identify how the practices of firms could sustain the engagement of a community. There are, of course, ways in which my research design limits the discovery of other interesting elements that might fruitfully be explored. For example, my design does not provide a wide variance in outcome, and so I am limited in what I can say about the relative importance or precedence of the eight practices. However, anecdotal evidence suggests some connections between practices. For example, the practice of promoting friendships with community members can be a consequence of hiring from the community. One "star" designer at Threadless was active and successful in the community for many years. By the time he was hired by the firm, he had already established friendships within the community, which he subsequently maintained.

Similarly, the practice of having top management involvement can precede other support practices, such as responding to community wishes. For example, the founder of Threadless used his engagement with the community to decide to publish raw voting statistics to members. Building on my findings, further research could test the individual effects of the practices on social identity and firm engagement. This research might use survey data of members across a wide range of firm-hosted communities or even experimental studies which could vary the perceived practices of a firm with which participants interact.

There are certainly challenges involved in creating a joint firm-community identity for firms that wish to follow this path. As a firm grows, or within a large firm establishing a community, it could be difficult for a firm to have its CEO as consistently involved in firm-hosted communities as I outlined. However, larger firms could rely on other senior individuals who may have such engagement as part of their role. Additionally, individuals may be hired that do not have experience within the community. The cases I studied tried to address this problem by giving regular community updates to the whole firm or by setting out incentives for employees to get involved in various community activities.

Adopting some of the practices I outline can require a shift in policy: Creating joint identity requires firms to be very open. Businesses often will have to share information that most firms would consider proprietary, such as strategic direction or new partnerships. I observed that there were some means the firms developed which allowed openness to the community without giving too much away to competitors. For example, the firms discussed more critical issues with selected groups of members. Threadless had

an ‘alumni forum,’ a blog only for printed designers or selected ‘community ambassadors.’ If a firm deemed certain information critical, it could discuss it with these groups first, before opening up the issue to the entire community at a later stage. As such, being relatively open did not create significant challenges for these firms.

5.7 Conclusion

In supporting the flow of external ideas into an organisation, firm-hosted online communities can be one important component of a firm’s portfolio of innovation efforts. While prior research has looked at the role of implicit and explicit incentives in fostering engagement by community members, it can be a struggle to reward communities appropriately over time and as they grow. My investigation of two long-standing firm-hosted online communities allowed me to explore the under-researched role of social identity in promoting engagement. I have provided details on the firm-level practices that help to break down barriers between firm and community and which contributed to shaping members’ self-identification, shared sense of mutual success, and emotional involvement. Positive joint social identity can help to engage members to contribute, allowing organisations to have increased and sustained access to what can be an important source of an external flow of ideas.

Chapter 6: Taking the eyes off the prize: Recreational labour in innovation contests

"Making stuff is the most joyful occupation in which we ever engage. It is […] the closest we come to God."

(Jake Nickell founder of Threadless citing Jeff Howe, journalist and author of the book Crowdsourcing).

6.1 Introduction

In running innovation contests, firms are shifting activities that have been previously carried out inside the organisation to the wider public (Jeppesen & Lakhani, 2010). Coming up with new product ideas, designing a product or finding an engineering solution to a technical problem are activities that have been traditionally the work of the R&D department in collaboration with other stakeholders in the organisation (Krishnan & Ulrich, 2001). In moving these activities to the wider public, firms are faced with a number of challenges. One of these is a change from an input based model of payment to an output based model. While the employees in the R&D department are mostly paid for their work according to the hours they put in, the individuals participating in innovation contests, hereafter referred to as contestants, are only paid if their contribution is chosen by the company. Unlike with employees, whose activities they can partly monitor, with contestants there is no control or contractual or formal relation. Thus contestants are free to leave the contest and the company whenever they want. As a result, the incentives for contestants play a central role in generating innovation (Boudreau et al., 2011). Most of the research on innovation contests has emphasised the importance of prizes and prize money in motivating and engaging individuals to compete in innovation contests (Boudreau et al., 2011; Schöttner, 2008; Terwiesch & Xu, 2008). This research assumes that the amount of effort people will put into the contest depends on their chances of winning (Terwiesch & Xu, 2008). As a result, they suggest that firms either need to set out very high prizes or restrict the number of people competing in the contests. If individuals feel their chances of winning decreasing they will either reduce effort or drop out of the contest altogether (Terwiesch & Xu, 2008). Furthermore, even if prizes do

motivate contestants, less confident contestants that do not feel that they have a chance in winning the contest will choose not to compete (Fullerton & McAfee, 1999).

The research in this chapter investigated the innovation contests at two firms that have innovation contests as their main source for innovation, the T-shirt firm Threadless and the automotive firm Local Motors. Nevertheless, their contests do not seem to follow predictions of solely extrinsically motivated contestants: despite the fact that Threadless only selects five designs for a prize of USD2000 each week, contestants submit over two thousand designs to Threadless every week. Most designers spend several days, if not weeks, preparing their designs for submission. Many of them are aware that the chances of winning are very low. Nevertheless, high participation and high effort of designers are key characteristics of the innovation contests run by these firm.

Previous research on innovation contests makes a central assumption about the tasks that contestants have to fulfil in order to create a contribution and enter a contest. They assume that the activities that contestants need to complete are not inherently rewarding enough in and of themselves: in other words, they fail to consider that the contestants might do with them without the likelihood of getting a prize or monetary reward for it (Terwiesch & Xu, 2008). This assumption seems reasonable given that if these activities are carried out inside the firm, those who do them are paid. In chapter 4 I have already shown that the combination of contests and communities creates an experiential learning environment that motivates contestants beyond extrinsic rewards. In addition to this, in this chapter I show that the way firms design the contests and the task of creating contest entries can turn a task that inside the firm is perceived as work into an activity that is inherently enjoyable and perceived as recreation by contestants. Firms that

successfully run innovation contests over an extended period of time rely on recreational labour. Recreational labour is a participant code and used differently from Ransome's (2007) use of the term that understands it as activities like volunteering in the community. Recreational labour for this chapter refers to the fact that firms receive a labour input in form of a contest entry from contestants that is then used by the firms, but for the contestants this labour input is not work. They view it as a recreational activity. They perceive creating an entry for the firm's contest as inherently rewarding, fulfilling and a valuable activity for themselves, even if they have only limited chances of winning the prize. The underlying driver of this perception is that the contest participation is intrinsically motivating.

This chapter focuses on the question: What design elements of innovation contests make participation feel recreational?

6.2 Innovation contest design

A number of studies have considered the design of contests for innovation. (Davis & Davis, 2004; Morgan & Wang, 2010). They have focused on two main areas: the prize for the contest and managing the number of contestants. In both areas, research has mainly analysed how to ensure maximum effort from contestants and best results for firms.

This work has found that the prize is essential for motivating contestants for the firm. Unsurprisingly, the higher the prize the more contestants typically want to participate (Yang et al., 2009). Different options have been identified for structuring the

prize. For instance, the prize could take the form of a winner-take-all or multiple prize model (Morgan & Wang, 2010). Prizes can also be first-price auctions instead of fixed prizes. While typically in an innovation contest a firm sets a prize up front for the contest, in first price auctions a contest is run and contestants set the price that they want to have for their ideas (Che & Gale, 2003; Fullerton et al., 2002). This way the firms do not need to accurately calculate a prize beforehand (Schöttner, 2008). This method can help contestants with low quality innovations win by asking for a lower prize. Another alternative is the provision of performance contingent prizes (Terwiesch & Xu, 2008). The winning contestant will be paid based on how well their idea is doing, for instance in the form of royalties paid to the winner. This method has the advantage of increasing the effort of contestants. By working harder they can not only increase their chances of winning, but also the size of the prize (Terwiesch & Xu, 2008).

Secondly, these studies have tried to calculate the number of contestants that a firm should accept to achieve the best possible results (Davis & Davis, 2004). The more contestants that there are, the less chance there is for individual contestants to win. As a result, when there is a large number of entrants, the contestants reduce effort and firms receive a worse result (Taylor, 1995). As a result, some researchers claim that to achieve optimal results firms need to limit the number of contestants (Fullerton & McAfee, 1999). From an economics standpoint in most cases the optimal number of contestants is two (Che & Gale, 2003). It creates competition, but also keeps the chances of winning high. Two equal contestants will exert the most effort as each of them has a chance of winning of 50% (Terwiesch & Xu, 2008). Nevertheless, the principle that entry should be restricted to increase effort has been challenged. Evidence suggests that opening up a

contest can provide firms with a more diverse set of ideas. These benefits of diversity can outweigh losses caused by decreased effort (Terwiesch & Xu, 2008). In this trade-off the focus of the contest is important in determining whether restricting entry or keeping access will achieve better results. For simpler contests, for which the solution seems relatively straightforward in a specific knowledge domain, restricting entry is best (Boudreau et al., 2011). In contrast, if an innovation contest's focus is on identifying a solution which might come from different domains of knowledge, the search benefits through openness outweigh the effects of reduced effort (Boudreau et al., 2011). If a firm restricts entry to the contest, it is in the firm's interest to prevent weaker contestants from entering. An option to achieve this result is by charging an entry fee that deters those whose expected profit from entering is lower than the fee (Fullerton & McAfee, 1999). The challenge with entry fees is setting the right level to attract enough, but not too many contestants. Consequently, in these situations, auctioning off entry is a successful strategy (Fullerton & McAfee, 1999). This way the firm will end up with higher skilled contestants who are willing to pay higher fees due to their expected profits.

Overall, research on innovation contest design has focused on how to best design for extrinsic motivation and not how to design contests that can elicit intrinsic motivation.

6.3 Perception of work or leisure and intrinsic motivation

Whether people perceive an activity to be work or not has been researched mainly in the context of social psychology of work and leisure. Just because an activity is not thought of as work does not automatically mean that this activity is leisure. There are

activities such as sleeping, eating or other self-maintenance activities that are typically not seen as either (Kelly, 2009). Nevertheless, participating in innovation contest does not fit into these activities. We can view them either as work or leisure, then.

The activity carried out is not the only important factor in this discussion. The attitude of the individual participating is crucial too. Individuals can perceive the same activity under the same circumstances and conditions differently (Juniu, Tedrick, & Boyd, 1996). Individual subjective experience is what drives peoples' perception of an activity. Most people are familiar with the dishwashing example. For some people dishwashing is one of worst activities to do while others find it relaxing and enjoyable. This evidence suggests that individual characteristics such as needs and capabilities are key factors in driving the perception of an activity (Kabanoff, 1980).

Furthermore, research has identified two core characteristics as driving peoples' perception of an activity as work or leisure. First, whether there is freedom to do the activity (Kelly, 2009). In this case, freedom is understood to mean that the person does not feel the need to do the activity out of commitment, obligation or responsibility, but has a choice of doing, or not doing, the activity (Neulinger, 1974, 1981). "Leisure is an activity—apart from the obligations of work, family, and society—to which the individual turns at will, by the relegation, diversion, broadening his knowledge and his spontaneous social participation, the free exercise of his creative capacity" (Dumazedier, 1967, p. 16-17). Looking at innovation contests, voluntary participation is a given.

The second core characteristic that differentiates people who perceive an activity as work from those who see it as leisure is the nature of their motivation. People who have a very high level of intrinsic motivation typically do not perceive the activities that

evoke this motivation as work (Iso-Ahola, 1979; Juniu et al., 1996; Shaw, 1985). Looking at amateur and professional musicians and comparing their perspective on their rehearsal and performance activities, Junui showed that, in either group, those who did not think that the activity was work also reported high intrinsic motivation (Juniu et al., 1996). The findings make intuitive sense, as if people find an activity inherently enjoyable they are less likely to perceive an activity as work. In line with this point, leisure theory takes high intrinsic motivation as one of the key characteristics of leisure experiences (Iso-Ahola, 1979; Neulinger, 1974; Shaw, 1985).

I will now further explore what makes people highly intrinsically motivated and so regard an activity more as leisure rather than work (figure 6).

Intrinsic motivation and its conditions

The concept of intrinsic motivation is a relatively new one. For a large part of the 20th century the dominant prospective on motivation was that individuals are motivated by extrinsic rewards. Particularly Skinner's (1938, 1965) experiments on rats showed that these animals could be conditioned to perform certain activities based on offering rewards upon completion of an activity. At the end of the 1950s, White (1959), based on his studies of animal behaviour, pointed out that many organisms engage in activities due to the inherent joy they feel in doing these activities rather than for gaining a particular reward. For instance, young children spend a lot of time learning to walk or talk without receiving direct external rewards for it. Intrinsic motivation can be defined as "doing an

activity for its inherent satisfactions rather than for some separable consequence" (Ryan & Deci, 2000a, p.56).

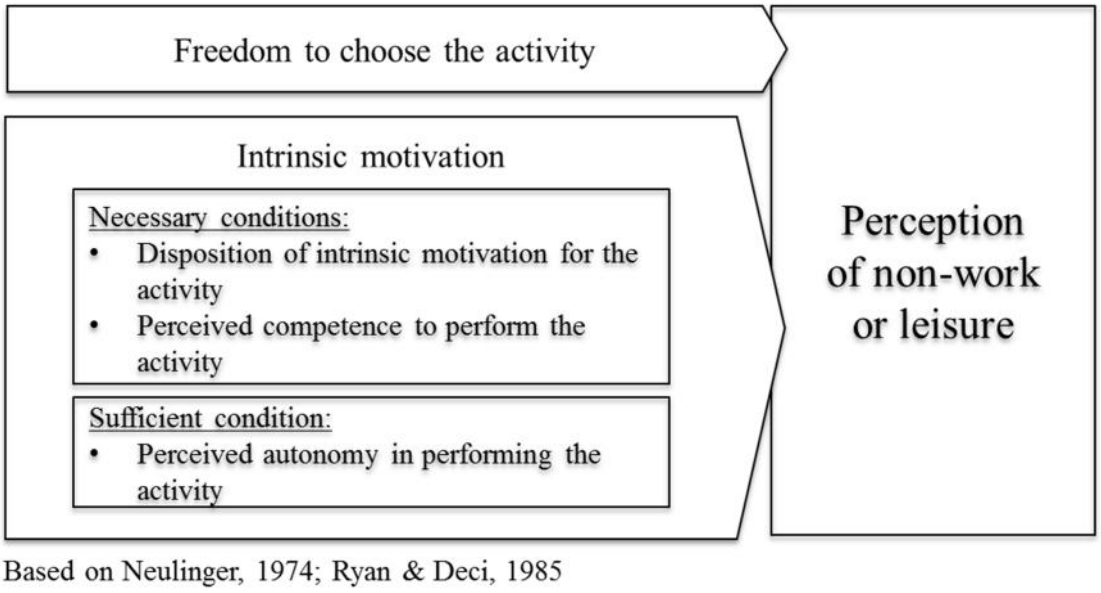


Figure 6: Dominant model of leisure

Initially, intrinsic motivation is an issue of peoples' individual disposition. Different people are intrinsically motivated for different activities and not everyone is intrinsically motivated for one particular activity (Ryan & Deci, 2000b). Nevertheless, even if an individual is intrinsically motivated, the context in which they carry out the activity can affect performance (Ryan & Deci, 2000a).

Self-determination theory has over time become the dominant perspective on why and when individuals become intrinsically motivated (Lepper & Henderlong, 2000). There are two factors which are critical for intrinsic motivation to occur: perceived competence and autonomy (Lepper & Henderlong, 2000).

If people feel that by completing an activity their competence increases, this will typically lead to an increase in intrinsic motivation. One study found that the motivation of undergraduates increased when they received feedback that enhanced their perceived competence whereas it did not for students that received other types of positive feedback that did not impact their perceived competence (Sansone, 1986). A number of other studies have shown that positive feedback on performance can increase intrinsic motivation (Deci, 1971; Harackiewicz, 1979) while negative feedback on performance reduces intrinsic motivation (Deci & Cascio, 1972). The effects of this feedback can be attributed to its effect on perceived competence and does not directly impact on intrinsic motivation (Vallerand & Reid, 1984). This means even without positive or negative performance feedback a person can be intrinsically motivated if they already perceive themselves as competent enough to perform a given activity. Similarly perceived competence can also increase as a result of self-reflection. If individuals repeatedly carry out a particular activity, they will often notice how they learn and get better at that activity. This self-administered positive feedback also increases perceived competence (Deci & Ryan, 1991).

Although being competent at a particular activity is a necessarycondition for intrinsic motivation to develop, it is not sufficient on its own. The most important condition for intrinsic motivation to develop is a feeling of autonomy in carrying out the activity (Ryan & Deci, 2000b). A lot of recent research on intrinsic motivation focuses on education and learning. Comparing different types of teachers, it has been found that those who give their students more autonomy and are less controlling have more intrinsically motivated students with higher levels of self-esteem (Deci, Schwartz,

Sheinman, & Ryan, 1981). Giving people the opportunity to self-direct their work by letting them choose what activities to do and how much time to spent on the activities will increase their perceived autonomy (Zuckerman, Porac, Lathin, & Deci, 1978). This result was found in experiments with pairs of individuals that had to solve puzzles where the first person was able to choose the puzzle and time allocation and then both had to do it. The first person showed significantly higher perceived autonomy and intrinsic motivation than the one whose choices were made by the other (Zuckerman et al., 1978).

To increase people's feelings of autonomy giving them choices in the activities that they are doing has been found successful in experiments with schoolchildren. Even if the choices seem trivial, they still had an effect on the perceived level of autonomy (Cordova & Lepper, 1996; Iyengar & Lepper, 1999; Langer, 1975). At the same time, different task characteristics can have a negative impact on perceived autonomy. Contrasting individuals that had a deadline to perform a particular task versus individuals who did not have the deadline, the group with the deadline showed less autonomy and intrinsic motivation (Amabile, DeJong, & Lepper, 1976). Similarly, the amount and type of directives individuals receive for a particular activity impact on intrinsic motivation. Koestner and colleagues (1984) point out that directives can have a controlling and an informational aspect. The controlling aspect makes the individual feel that they are pressured in a particular direction, thereby moving the locus of causality outside of the individual and undermining intrinsic motivation. On the other hand, the informational aspect provides relevant information for carrying out a task while maintaining the perceived autonomy. As a result, the locus of causality remains internal and intrinsic motivation is maintained or even strengthened. An example of the difference between

these two types of directives for children would be: ‘you must not hit other children’ versus ‘hitting other children is not good’. Testing the impact of different types of directives on children, controlling directives decreased intrinsic motivation whereas informational had no negative impact (Koestner et al., 1984).

There are two main ways of measuring intrinsic motivation. First, there is the so-called free choice method first used by Deci (1971). Typically used in experiments, it measures how long participants spent doing a particular activity without the promise of any compensation and after the researcher has actually left the room (no reward, no approval) (Ryan & Deci, 2000a). The second method measures intrinsic motivation based on the reports of interest and enjoyment of a particular activity by the participants (Harackiewicz, 1979).

Relation between extrinsic and intrinsic rewards

A lot of research has focused on the relation between extrinsic rewards and intrinsic rewards and their effect on motivation (Cameron & Pierce, 1994; Deci, Koestner, & Ryan, 1999; Kohn, 1996; Tang & Hall, 1995). The focus of these studies was particularly on the question how the presence of external rewards influences the working of intrinsic motivation (Cameron & Pierce, 1994). This interest is particularly relevant when talking about intrinsic motivation in innovation contests. These contests are primarily associated, and often become publicly known, because of their external rewards. For instance, the Netflix prize, which awarded the development of a computer

logarithm for predicting user ratings, is mostly associated with the $1 million in prize money set out by the company (Bell & Koren, 2007).

The dominant perspective with regards to the effect of extrinsic rewards is that they undermine intrinsic motivation (Deci et al., 1999; Deci & Ryan, 1985). Individuals that receive or expect a reward are less likely to be intrinsically motivated. For instance, Kruglanksi and colleagues (1971) conducted an experiment with Israeli high school students. They offered one group of students a reward in the form of a tour of the research laboratories after they had participated in a number of experiments. The group that was not promised a reward showed much higher intrinsic motivation and were more creative. Similarly, Deci (1971) found that a group of students that was not offered payment for solving puzzles showed significantly higher intrinsic motivation than the group that was. These students continued to play these particular puzzles for longer after the researcher had left the experiment and there was no further money at stake. In the context of book reading programs in which children are offered incentives for every book they read, students that previously enjoyed reading books before the introduction of the program lose intrinsic motivation. The extrinsic rewards confuse these students as they are now reading for gaining rewards (Kohn, 1995). These programs change their perception of the activity as a means in itself to a means for gaining a particular reward. This shift can lead to them devaluing the activity altogether as the reward becomes a form of control (Deci & Ryan, 1985).

Nevertheless, research has shown some conditions under which extrinsic rewards have no negative impact on intrinsic motivation. If an extrinsic reward is unexpected it is more likely to have a positive effect on subsequent intrinsic motivation (Lepper &

Henderlong, 2000). Furthermore, extrinsic rewards which are social or verbal (for instance, being complimented for a particular activity) are less likely to have negative effects on intrinsic motivation. The reason for this can be found in the signalling value of receiving these extrinsic rewards (Lepper & Henderlong, 2000). They give the recipient of the rewards positive feedback that enhances their feelings of their own competence in carrying out the activity (Deci & Ryan, 1985). Competence, as described above, is a critical factor for generating intrinsic motivation. In this context it is also important to note that is not only the nature of the extrinsic rewards but also what rewards are given that influence the impact on intrinsic motivation. If a reward is given for an achievement, something that requires being better than others, or being particularly proficient in an activity, then it has the just described perceived competence enhancing effect and has a positive effect on intrinsic motivation. If, on the other hand, the reward is given for merely doing an activity, independent of the individual competence or quality of doing that particular activity, then the extrinsic rewards will undermine intrinsic motivation (Lepper & Henderlong, 2000).

Overall, extrinsic rewards increase intrinsic motivation if they provide positive information regarding one's own capabilities, but undermine intrinsic motivation if they act as form of control providing pressure to perform a certain activity, thereby reducing autonomy (Deci et al., 1999; Tang & Hall, 1995).

Performance implications of intrinsic motivation

In discussing innovation contests and peoples' motivation to participate, one central question is to what extent it matters whether individuals are intrinsically or extrinsically motivated to participate. Comparing intrinsically and extrinsically motivated individuals on their performance with regards to particular activities showed that the intrinsically motivated individuals are more interested and excited in carrying out the activities. This enthusiasm translates into higher persistence as well as performance (Ryan & Deci, 2000b). Some evidence for these findings comes from educational research that showed that both the technical quality as well of the creativity of schoolchildrens' artwork was correlated with their level of intrinsic motivation in creating the artworks (Koestner et al., 1984). Part of the higher performance of intrinsically motivated individuals lies in the amount of effort that they will put into the activity. Extrinsically motivated individual will put in enough effort to earn the external rewards while intrinsically motivated individuals will be prepared to put in more effort and go beyond what it is required (Amabile, 1996a). They will draw skills from other domains or even invest acquiring new skills (Amabile, 1996a).

Research has emphasised the important role of intrinsic motivation particularly for creativity and creative tasks (Amabile, 1996b). An experimental study of creative writers found that those individuals that viewed themselves as extrinsically motivated were significantly less creative than those who saw themselves as intrinsically motivated (Amabile, 1985). Companies have made similar findings on the effect of intrinsic motivation in their own R&D departments (Dewett, 2007). Besides these effects, all of which can have a direct effect on the performance of companies, high intrinsic motivation

also leads to higher well-being (Deci & Ryan, 1995) and higher self-esteem in the individuals carrying out the activity (Ryan, Deci, & Grolnick, 1995).

In the following study, I have explored what design elements of community-based innovation contests make contestants feel intrinsically motivated and, thus, perceive creating contest entries as recreation. I will outline the methodology I have used in the next section.

6.4 Methods

Data collection and analysis

One key aspect of my inductive research was to understand how contestants perceive the activities they do for the firms in the contests (Eisenhardt, 1989). As such I relied on the same data sources as in previous chapters. I interviewed active contestants in both cases, asking them about what they did for creating a contest entry as well as how they felt about doing these tasks. Surprisingly, despite the fact that I could observe that the firms greatly benefited from the activities of contestants, the majority of contestants in both companies made it clear that creating contest entries did not feel like work. This finding was also confirmed by the accounts of firm employees. During these interviews, a community manager at Local Motors pointed out that they had termed this phenomenon recreational labour. In further rounds of interviews with firm employees and contestants, I explored the underlying reasons why contestants felt what they were doing was recreation, and analysed how the firm played a role in creating this perception. In

addition, I was also able to observe several contests that were run internally as well as online on the contest platform (Maylor & Blackmon, 2005).

For the analysis, the transcribed interviews, field notes and online data were analysed using NVIVO 9 (Bazeley, 2007). In an initial round of open coding, perceptions of contestants of their activities as well as the reasons given by contestants for these perceptions were coded individually for each case (Miles & Huberman, 1984). At the same time potential firm practices associated with these reasons were open coded for each case. This analysis confirmed that a large number of contestants in both cases perceived creating entries for contests as a recreational and leisure activity rather than work. In a cross-case comparison (Eisenhardt, 1989), I identified underlying concepts for this perception. On a first level, contestants emphasised the inherent joy that they have in creating contest entries. This joy in both cases was related to design elements of the innovation contests. Central contest design elements that emerged were, for instance, freedom in contests, ownership of ideas and openness to participate in a firm's contest. As a result, self-determination theory emerged as a valuable lens for looking at my findings (Deci & Ryan, 1985). In a further round of analysis, iterating between the theory and the data, the final concepts and the relation between them (firm practices and the contestants' perceptions) were identified (Punch, 2005).

As with the other chapters, the findings were discussed, refined and validated in further interviews with key respondents from the community and firm side (Miles & Huberman, 1984).

Examples of creating contest entries

Contestants at both Threadless and Local Motors take creating contest entries seriously. Typically each of the contestants has their own processes for creating contest entries. In the following, I will show typical examples that nonetheless might not be representative of all contestants.

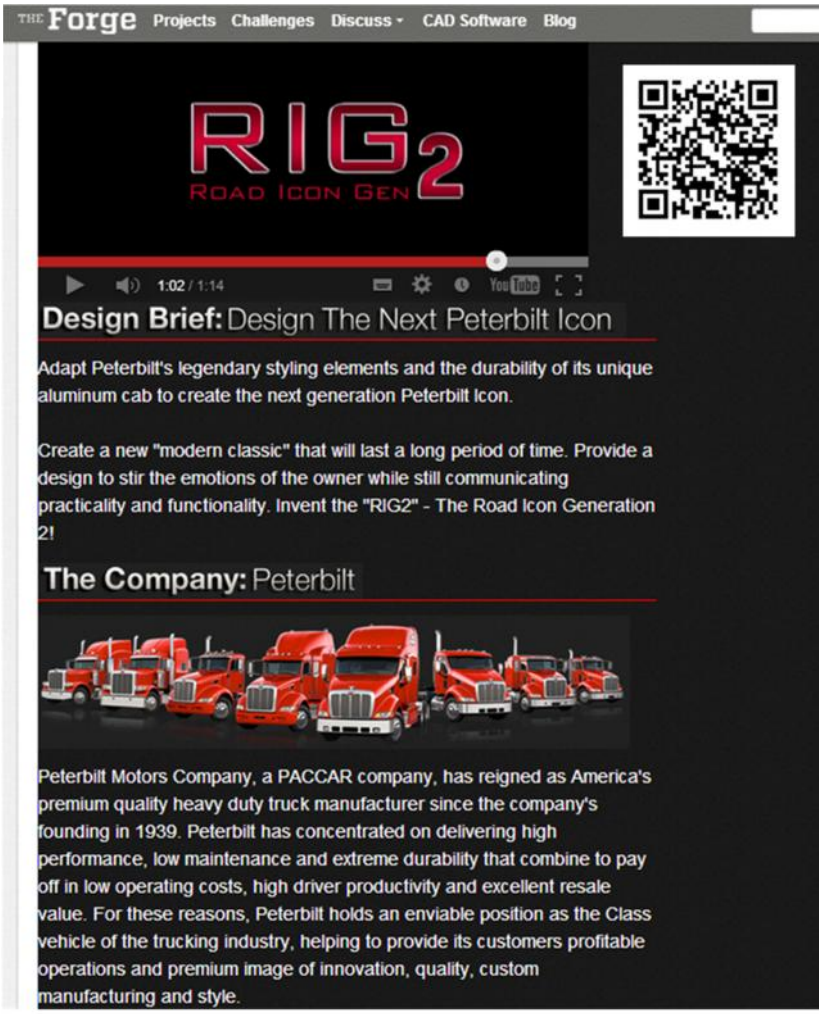
Threadless has two types of contests. The first type of contest is the on-going general contest to which participants can submit any design that is printable on a T-shirt. This contest is the original Threadless contest and is the most popular. The so called "Threadless loves" challenges ask contestants to provide a design for a particular topic. These can be topics coming from one of Threadless's partners, such as Disney, or general contests around a topic for instance "Threadless loves dysfunctional families". Contestants typically have a book in which they note down ideas for shirt designs. Typically they will initially develop a sketch of one of their ideas. Often they then post the sketches of different shirt design concepts onto the Threadless forum in order to hear the opinion of the community. Concepts that receive positive feedback by the community are then further developed. This means the contestants turns the sketch into a full digital drawing. Often contestants also seek additional input from the community during this stage. They seek advice on colours or other ideas on how to refine the design. They will then put their design on a virtual T-shirt model to present their idea and then submit it to Threadless. Many contestants then try to promote their design in the community to achieve higher votes. On top of the actual creation of submissions, many contestants are active community members and, as such, vote on designs, provide feedback to other contestants as well as participate in the Threadless forum. This can help them to

understand trends and improve their skills as I described in chapter four. In total, contestants typically spend several days, sometimes weeks until they feel ready to submit a particular design.

Local Motors contests are slightly more complex because of the nature of the products that they develop. For each contest there is a competition brief in which contestants can see what the company is looking for. Most contestants spend significant time familiarising themselves with the brief, often doing additional research in order to understand it fully and to develop initial ideas for contest entries. Contestants will then start to develop their ideas. As shown in the example (exhibit 4), contestants often explore different engineering solutions or designs initially and seek out the feedback of the community as well as employees that are active on the site. Furthermore, contestants typically participate in so-called “tiny chats” in which they can pose questions regarding the competition brief to the firm. Typically contestants spent several weeks of sketching and developing their concepts in an iterative way, seeking out feedback from the community and firm. Each contest has its own work in progress forum precisely for this purpose. A critical element for each contest is the way entries are presented: cosmetic design is important in getting votes. For a car design this means turning sketches of the vehicle into a 3D rendering that makes it look like an actual, real life vehicle (exhibit 4). Naturally contestants not only work on their own entries, but also provide feedback to other contestants. Contestants typically spent several weeks on the creation of one contest entry.

Exhibit 3: Local Motors – Peterbilt RIG2 competition brief

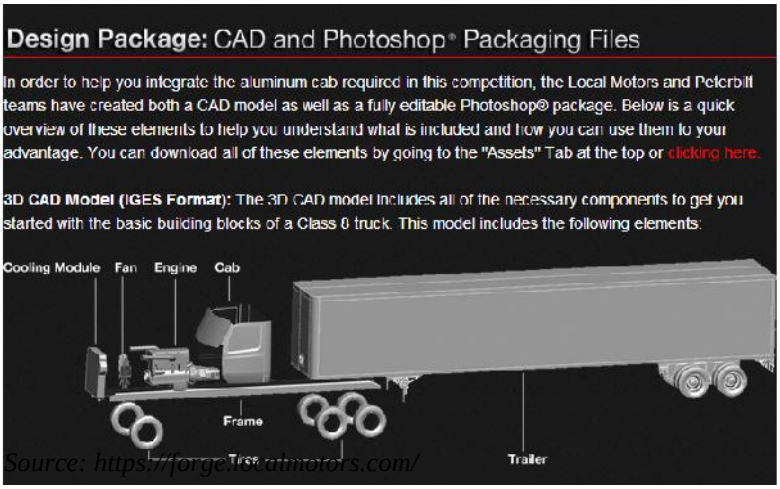
Contest brief-introduction



Use the QR code for video evidence

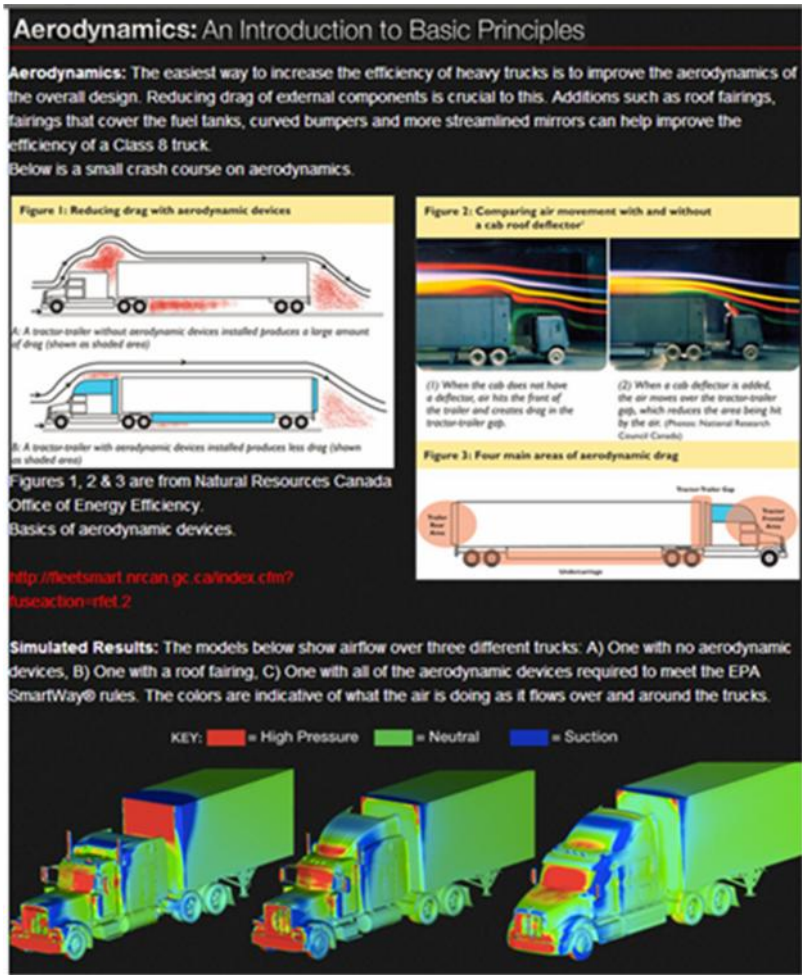
Source: https://forge.localmotors.com/

Contest brief-requirements (excerpt)



Source: https://forge.localmotors.com/

Contest brief-educating and guiding (excerpt)



Source: https://forge.localmotors.com/

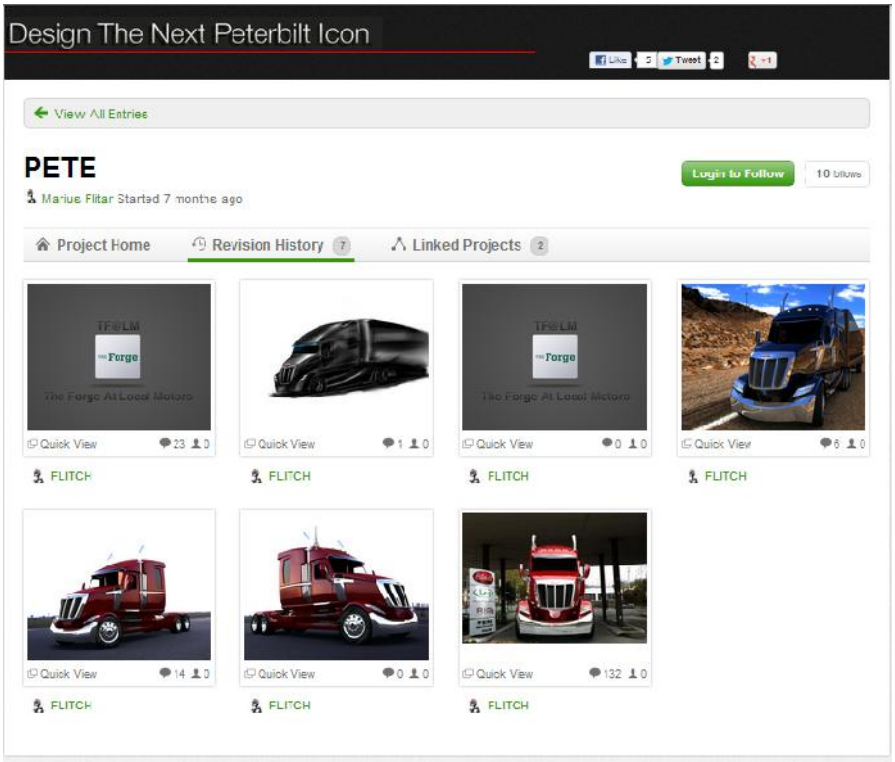
Exhibit 4: Local Motors – Peterbilt RIG2 Competition – winning entry "PETE" by Flitch, Marius Flitar

Final 3D rendering of a contest entry



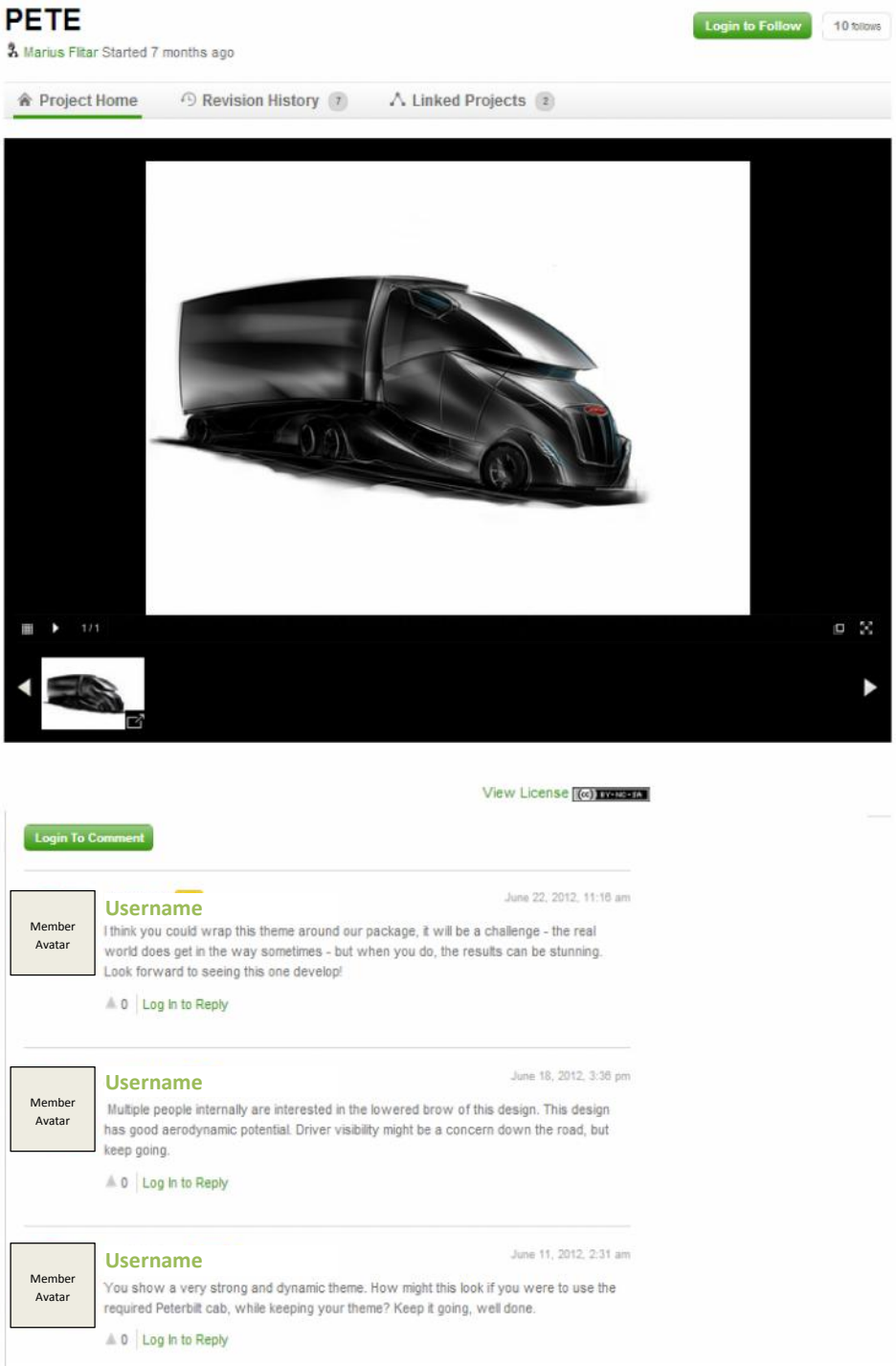
Source: https://forge.localmotors.com/; Design by Marius Flitar

Several rounds of revisions for one entry



Source: https://forge.localmotors.com/; Design by Marius Flitar

Each revision with several rounds of feedback from the community and company



Source: ***https://forge.localmotors.com/****; Design by Marius Flitar*

6.5 Results: Recreational labour and innovation contest design

In the following section I will explain how firms design innovation contests that create intrinsic motivation and thereby make contestants perceive contest participation as a recreational activity. As such I will show how activities that are similar to what would be regarded inside the firm as product development work are turned into recreation. I will start out by showing evidence that a large number of contestants do not perceive what they do as work, but as recreation. Furthermore, I will show how this perception is driven by the high intrinsic motivation of contestants as well as the implications of the intrinsic motivation for their participation. Subsequently, I will explain why contestants are highly intrinsically motivated in these innovation contests. I will highlight the contest design elements that elicit intrinsic motivation in particular. Figure 7 summarises the main findings and table shows some associated firm activities.

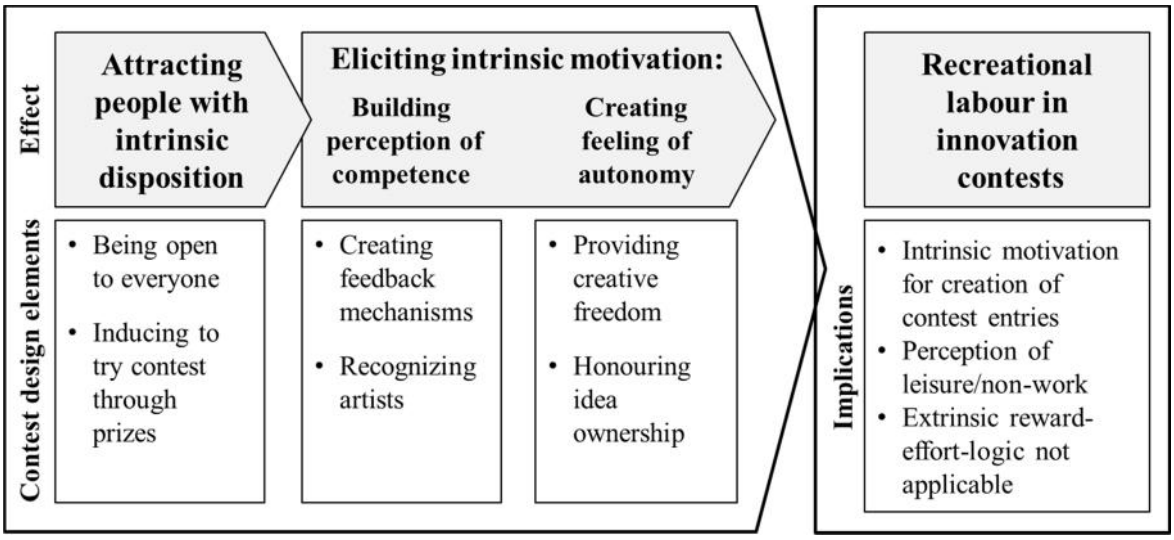


Figure 7: Creating recreational labour in community-based innovation contests

Table 19: Examples of firm activities that help to elicit intrinsic motivation

Effect --	Contest design elements	Threadless	Local Motors
Building perception of competence	Creating feedback mechanisms	• Providing feedback function for each entry • Providing prize for most active feedback givers	• Providing feedback function for each entry • Recognizing members for quality and number of feedback provided
	Recognizing artists	• Presenting one new shirt design per day to get maximum attention for the artist • Recognizing outstanding artists at family reunion with special prizes	• Featuring best entries centrally on website • Holding events for recognizing artists • Hall of fame in the factory
Creating feeling of autonomy	Providing creative freedom	• Using inspirational texts for contest briefs rather than requirements • Running general open contest • Liberal admissions to contests	• Using videos of cities that cars would be used in to inspire • Explicitly point out freedoms in contest brief • Providing CAD data to simplify requirements of contest brief
	Honouring ownership	• Paying for IP per use (one payment per product category and reprint) • Taking rights only for the design on a shirt (leaving right for e.g. artprints with designer) • Prominently acknowledging contestants' names on product	• Separating prize money and buying of intellectual property • Recognizing creator with name on the final product • Protecting contestants' IP interests against partners

Recreational labour in innovation contests

Despite the fact that the contestants carry out activities that are similar to what would typically be done inside the firm, their perception differs to how employees would view their work. In asking them how they view the task they perform in order to create a contest entry, three quarters of the interviewed Threadless' contestants and more than half of the Local Motors contestants emphasised that creating these entries does not feel like work. "It's my hobby, what I do to decompress after a busy days work and I like to just draw what I want to draw so, and I do that and Threadless allows me to do that and it by no means is it work" (Threadless contestant).

We can see that these activities are recreational by looking at when and how they carry out work on contest entries. They report on how they use their lunch break to vote on entries or to check what is happening in the community. They further elaborate how they create the entries in the evenings. "It's a wonderful thing because it's something that I do after I put the kids to bed from about 9 to midnight every night and I just sketch here and there and sometimes I will take a break for a while and pick it back up" (Threadless contestant). They further elaborate how they sometimes cannot wait to get home to start or continue work on their latest competition entries:

> "And you sometimes are sitting at work just waiting for the end of the day so you can really pour yourself into a Threadless design which is funny because you know, I'm passionate about what I do during my day job but it definitely feels backwards sometimes because you just can't wait to work on something for Threadless, you're really enjoying it" (Threadless contestant).

Table 20: Recreational labor in community-based innovation contests

	Threadless case data	Local Motors case data
Creating entries does not feel like work	"It helps to follow trends and so and so forth. But basically, you design whatever you want to do. You put it out there and maybe it will print, maybe it won't. I always felt like **I wasn't, you know, working for Threadless— I was just like doing what I wanted to do.** And, what I was interested in" (Threadless contestant).	"I put a lot of effort into the competitions, but **it never feels like work. It is so enjoyable.** There is a big fun aspect. I think some people lose the fun aspect because they get too caught up in it and not realise that this is for community enjoyment" (Local Motors contestant).
Creating entries is recreation	"Sometimes **I would be at work for nine hours come home and have some dinner and chill out and then I'll jump on the computer and start doing Threadless.** People will say how can you sit back on your Mac again after being at work all day? And I will sort of say it's not work it's just … although I'm using a computer which is exactly the same, your mindset is totally different. For me it's total pleasure, not work". (Threadless contestant).	"We get to talk about the car, we get to talk about the problems associated with different engineering aspects and forces and dynamics**. It is like a good old world get together around in a car in the garage and just have some fun**. And that is what keeps get me back to it, I keep going back and enjoying it so much". (Local Motors contestant)
Intrinsic motivation: Joy of creating	"I will do it however long it takes me to complete it. I submit it. If it doesn't make it I don't get the [USD] 2,000 it doesn't matter it's a design a do. It's something that I did. **I love creating things**" (Threadless contestant)	"**I did a lot for the contest entries with pleasure.** It was such a pleasure to work on it. I developed more than six different lines [different concepts], followed the chats and the feedback from the community" (Local Motors contestant)
Intrinsic motivation: Extrinsic reward not important for entries	"It's more important now but it [the prize] is still not the focus of why I am on there at all. It's just to be a great creative and just enjoy what I'm doing really and hang out with the community and **if I get some extra money then it's brilliant and if I don't get a print for years then it's not a problem.** It's just to kind of keep me creative really" (Threadless contestant).	"I was enjoying it throughout the process. **It was not something I did for the prize**. I did not even know that I had a chance, but I liked it so much. I met that challenge, it is something I did for me first and then for the others" (Local Motors contestant).
Effort: It does not matter how much time an entry takes	"**And it is not hard for me to spend 48 full hours to be working on something because that is literally what I want to do.** There is nothing else I would want to be doing and making something like that perfect. And I think a lot of the artists have the same way about submitting designs." (Community manager, Threadless)	"**I put in weeks, not days.** The last week was absolutely full. I had moments I could not sleep in the night because I had to finish something. So I went to bed and after one hour I go to the computer again. That happened in the last week [of a contest] […] After one thousand sketches I started the 3D, hand sketching." (Local Motors contestant).

The recreational nature of these contests becomes particularly clear when they contrast their activities with their daily full-time or school work.

> "I get approached every week to do specific illustration work according to the requests of whoever is contacting me, you know. They will email me or they will call me and they will say 'I want you to draw superheroes that's doing this for this purpose' and for the most part I never do those things because that is work, been told what to draw, been told you know, that they want Four Huskies and a mountain in the background or whatever that trying and work out somebody else's vision and put it on the paper and then get their feedback on it, no that's not quite what I wanted, you know, that's work to me and it's something that I try and avoid but Threadless the reason why it's different is they are not giving you any—they are not telling you what to draw or submit. It's just an open door" (Threadless contestant).

Earlier research that looked at why individuals perceive an activity as non-work and recreation found a high level of intrinsic motivation to be a key driver (Neulinger, 1981). In line with these results, I find evidence of strong underlying intrinsic motivations of contestants for the creation of contest entries. I have strong evidence of the two most commonly used measures for intrinsic motivation at Threadless and Local Motors. First, contestants describe the fun and enjoyment of creating these contest entries. These characteristics form one of the indicators for intrinsic motivation. Whilst community members acknowledge that it would be a great honour to win a contest, most of them emphasise how much fun they get from only creating the contest entries: "I feel like I am just doing my own thing. And I would rather do that and not win than do a freelance job that I hate and get paid for it" (Threadless contestant). This contestant's sentiments are representative. Many of them emphasise that having fun in creating their contributions is more important than actually winning the contest or making money.

As for the second measure of intrinsic motivation contestants explain that it is not the extrinsic rewards that mainly drives them to create contest entries. Contestants point

out that the rewards they receive stand in no relation to the effort they put in considering the number of entries it takes to get eventually selected by the firms.

> "It's self-fulfilling, self-indulgent work. And at the end of the day there is no way that like, if you look at the overall success rate for me and for most designers on Threadless the cash does not outweigh. The prize cannot pay for the amount of designs that you have to submit to actually go in. If you worked out your hourly rate you will be under the average wage." (Threadless contestant).

In line with this reasoning, contestants even point out that they would have created the entry anyway, even if there were no firm or contest, again highlighting the inherent enjoyment for creating these entries: "It's almost not even necessarily that I am doing it for Threadless, it's just that I am doing it and Threadless gives me a place to put it and then possibly they're printing it" (Threadless contestant). In figure 8, four contestants' profile vignettes are presented. These show that contestants do not have other ambitions, neither career wise nor do they strive for other rewards. They purely enjoy creating contest entries.

The recreational nature and the underlying intrinsic motivation also help to explain the large number of contestants that submit to Threadless and Local Motors. Traditional perspectives on innovation contests (Terwiesch & Xu, 2008), in which contestants purely determine effort based on size of the prize and chances of winning do not explain this trend. The intrinsic motivation of the contestants offers an alternative explanation of why so many of them stick around despite the normally meagre chances of winning.

Figure 8: Example profiles of contestants

Example I: Threadless Contestant

From: North America

Occupation: Advertising designer

Age: 20-30s

Reason for participation: Wanted to do something outside of marketing and without having to please a client

Perspective on creating contest entries: She does it whenever she feels like it and works on ideas that feel right to work on at that point in time

About winning: Winning is nice, but she won't change her creations for it

Other information: When she creates an entry she forgets time and indulges in the process

Example II: Local Motors Contestant

From: Eastern Europe

Occupation: Telecom engineer

Age: 40-50s

Reason for participation: Always wanted to be a car designer, but only got into engineering school

Perspective on creating contest entries: He loves creating great vehicles, spends day and night on an entry during a contest

About winning: Rarely thinks about the prize when participating in a contest

Other information: No career ambitions in car design as feels too old for a career change

Example III: Threadless Contestant

From: Western Europe

Occupation: Graphic designer (many years of experience)

Age: 30s

Reason for participation: Went to Threadless because he wanted to do something away from his commercial clients, something that he enjoys doing

Perspective on creating contest entries: He can do whatever he likes, nobody controls or directs him.

About winning: Never thought that he would have had a chance winning, but did after a number of submissions. That was a bonus.

Other information: Loves to work on Threadless entries to wind down after work

Example IV: Local Motors Contestant

From: North America

Occupation: Store manager

Age: 30-40s

Reason for participation: Long-time fascination with engineering and cars, but did not go to engineering school

Perspective on creating contest entries: He feels his skills are often not on the level that is needed to win, but he loves being creative with cars and thus enjoys participation

About winning: Winning is a bonus, not the reason why he participates

Other information: Whenever he has time off work and no family commitments, he pours himself into a contest on the Local Motors site

In line with this observation, the effort that contestants put into their entries is higher than what would be expected based on the chances of gaining extrinsic rewards. In essence, this means firms get better product ideas out of the contest or, as somebody from the Threadless top management team, put it: “The great benefit that we have is that people are doing these things without looking at the cost, actually they are doing these things because it’s fundamentally what they want to do anyway”. The effort that community members put in supports this observation: “On Threadless I mean I’ve spent hours and hours on a design I don’t really care—I mean I don’t even want to say hours, days, weeks, like I just—I know that it’s something that I will have in my portfolio that I love and it’s not necessarily” (Threadless contestant).

Contestants at Local Motors, driven by intrinsic motivation, put in a lot of effort in their entries too, as one contestant describes: “I did a lot for the contest entries with pleasure. It was such a pleasure to work on it. I developed more than six different lines [different concepts], followed the chats and the feedback from the community”. Contestants, therefore, have a high level of intrinsic motivation. But why is this? How is it developed? These questions are particularly difficult to answer given that contest environments traditionally emphasise extrinsic reward. To answer these questions, I will show how firms attract members who already have an intrinsic disposition to create designs and generate the conditions for eliciting intrinsic motivation.

Attracting people with disposition for intrinsic motivation

In order to be intrinsically motivated, individuals need to have an intrinsic disposition for doing a task, irrespective of outside conditions and the nature of the work (Ryan & Deci, 2000a). This intrinsic disposition is related to the characteristics of contestants and their reasons to participate.

Generally contestants with three different types of background created entries in the innovation contests, all sharing the intrinsic motivation to create contest entries. With the background the disposition for intrinsic motivation differed. First, there were those who had a profession and full-time work that differed from what they were doing for the contests and also required a different set of skills. Members participating on Threadless and Local Motors were nurses, television producers, or pastors in their professional career. Nevertheless, these people had a long-standing interest in graphic design, car design, or engineering, but never the opportunity to do the activities professionally or even have a company actually consider manufacturing what they created. Before starting to participate in contests, many of these people felt limited in carrying out their hobbies. The reasons for this varied, but included not knowing other people with similar interests in their area and lacking tools and skills or just confidence.

> "Just to give a little insight into me, I am a typical guy, family man. I have always drawn and I had plans and aspirations to do stuff with my art when I was younger, but I never did it. I got busy with life and I just stumbled upon Threadless one day because a buddy of mine was wearing their shirt and thought it was just a really brilliant concept and thought it would be something that I, you know, could find the time for in my busy schedule to participate in, you know maybe get out my old pens and pencils and try drawing again and it had been years since I had really tried to do any work" (Threadless contestant).

The same type of contestants can be found with Local Motors:

> "Well I am a tinker, I love to tinker with things but I have never gone to college for engineering or design school or automotive repair or anything like that. I am

> actually a Bible Major, Bible and Missionary Major was my college Bachelor's Degree. And so my education has been in the aspect of the word of God and helping people spiritually.[…] And so Local Motors was this opportunity for someone like me who is not going to spend a majority of his life, cannot spend a majority of his life studying or being involved with engineering especially with automotives and yet still we get to take part" (Local Motors contestant).

This type of contestants' disposition for intrinsic motivation was based on the underlying desire to follow their long-standing interests. For these competitors, participating in the contests was a great opportunity to undertake a hobby that they had loved for a long time, but had never had a chance to do in a professional environment.

Secondly, in both cases, there were a significant number of students participating in the contests. These students were design, engineering or even high-school students. These students saw the contests as great opportunities for practicing and developing their skills in a professional environment, often complementing their more restrictive school work in these domains. The fact that creating entries was a great learning exercise provided motivation for these students. One of the Local Motors contestants commented: "I'm a high school student right now, I'm only 17 but I'm trying to work towards the automotive career so I'm trying to get as much help as I can now to prepare for that".

The third group of contestants were people that used very similar skills in their professional lives as they used for the innovation contests. These people were graphic designers that did contract work as their main job or worked in advertising agencies, and car designers that worked for large automakers. These members found parts of their professional work frustrating, as they were not using or developing their full set of skills. Furthermore, because of often strict organisational or project specifications that guided their work, they felt limited freedom in their work:

> "Usually in my day to day job I'll be satisfying somebody else's design brief. So they will say okay we want to use grey and gravy blue and we are an accountant and it's all very corporate. And then when I get home I'll think I don't know it will be a pattern and put a panda in it. You know what I mean? I can just come up with an idea in my head sketch it out quickly on a piece of paper and say that might work and then just submitting. You don't get the free reign of creativity in a corporate design job that you do working for Threadless. Unless you work in London or San Francisco for a massive agency." (Threadless contestant).

So the contests gave the designers the opportunity to do the activities they enjoy, but with a higher degree of freedom and control than at work. In creating contest entries, not only were they able to experiment and develop their skills, but also to create and develop ideas in their own personal style.

Neither firm has hard data on how big these groups are. Based on my interviews at Threadless these three types of contestants seemed to be equally prevalent. At Local Motors there were mostly enthusiasts and students, not so many professionals. This finding can be related to the fact that professionals at automotive OEMs are often not allowed to participate. Consequently those who do will not disclose their background. All these groups of potential contestants shared a natural interest in creating contest entries as it is one of their passions. This disposition could be turned into intrinsic motivation for creating contest entries, given the right environment. Yet before this, two practices were key in attracting contestants to participate in the contests.

Key to attracting participants with the right disposition was the openness of the firms: they encouraged individuals with all types of backgrounds to compete in the contests, not asking for particular qualifications or skills. Car enthusiasts or designers that never attended engineering or design school respectively could compete in the contests as long as they were able to fulfil the minimum requirement in terms of output format for the

entries. The requirements were set intentionally low. In the case of Threadless this meant providing their design in a particular file format and resolution on a T-shirt template of their choice. At Threadless, submitted designs had to go through a pre-screening process in order to avoid copyright issues or offensive designs, but during this screening process designs of all quality levels were given an opportunity to enter the contest.

> "One thing I think is smart that they [Threadless] do, which a lot of old time bloggers and designers don't like. They accept designs from people of every level. A lot of bloggers and voters feel like they shouldn't accept so many designs but I think it's one of the best things they could possibly do. That's what draws a lot of people to the site, a chance to see your artwork voted upon and sure maybe some people suck, everyone does when they first start but I think they do a really good thing in accepting those designs and letting people vote on them" (Threadless contestant).

Furthermore, the firms actually supported potential contestants with little experience to fulfil the requirements. Contestants that did not meet the requirements were provided with feedback by the firms on how to improve their entries for future contests. This openness allowed students and hobbyists in particular to enter the contests.

Table 21: Attracting people with intrinsic disposition

	Threadless case data	Local Motors case data
Firm practice: Being open to everyone	"Threadless is like the American Dream still where **you could be nobody and you can submit** based on your talents and if Threadless wants to print it, you can rise up, you can stay there, you can make your own friends and maybe even go off and do your own thing […] They make an effort to print people that have never been printed before." (Threadless contestant).	The CEO of Local Motors called a brainstorming session to define a new slogan for the company. The session involved the community managers and former community members that worked for Local Motors. The main discussion point was to **find a slogan that would make individuals of all backgrounds and skill levels feel welcome**. They agreed on: "Empowering a world of autoMAKERS" (Observation, 23rd February 2012).
Effect: Access for individuals for whom creating entries is special	"For me it's about … **it's just my way of expressing my creativity and doing things away from my workplace**. […] It's purely about that kind of creativity and doing different things really. I've got loads of ideas and I'll scribble them all down. And it's a great place to kind of share them and in anyway it's kind of Threadless to give you really good opportunities" (Threadless contestant).	"I wanted to become a designer. I applied to design school, but in communist times this was another ball game. Every year there were seven places and 1000 candidates. I tried to, but I failed**. So it is special to be able to do it on Local Motors**" (Local Motors contestant).
Firm practice: Inducing to try contest through prizes	"**I joined because of money**, only because of money in the beginning yeah. […]They have the best money. You don't lose your rights on your art. I can publish wherever I want on any magazine internet site. I have my rights. In other sites you lose your rights and get less money" (Threadless contestant).	The CEO of Local Motors explained the upcoming contests. He emphasized that they were able to **negotiate highly attractive prizes** with each of the partners. For the BMW contests the winners would not only get a monetary reward, but would be able to fly to Munich and meet with the head of R&D at BMW. (Informal chat, 30th July 2012).
Effect: Shift from focus on prizes to experience	"And I was like, man, **he made like 2,000 bucks off this one design**. So that really encouraged me to start submitting some stuff. **To me, it was incredible; you can display work, get feedback and so on. Um, and I really liked the community there.** They're very supportive. So, yeah, I just kept doing it and doing it. And I wasn't actually expecting to get printed because like I had heard from a lot of people like you know, that oh my brother got lucky.".	"Actually in the beginning **when I first started** this competition, **it was basically on an aim to win something**, **now it is basically on an aim to participate for the sake of improving myself** because there is no other better way of improving them by practice. And there is no other better way than by getting feedback because if you keep practicing that is one thing but if you keep practicing alongside with feedback you are actually improving much better and at a much faster rate".

Extrinsic rewards are an integral element of innovation contests. Research so far has considered them the essential driver for the effort of contestants. Yet in the case of community-based innovation contests the extrinsic rewards, particularly the monetary prices, also fulfilled important functions for attracting contestants. In order for an individual to know that they are intrinsically motivated to perform a particular activity, the individual needs to experience doing the activity before actually knowing. Consequently, it is important to get individuals involved in order to make this experience happen. Both Threadless and Local Motors offer attractive extrinsic rewards for the winners of the contests. Threadless offers US$2000 for every design they print plus US$500 for every reprint. This is almost 4 times as much as some of the companies that have tried to imitate the Threadless model over the years. Potential contestants consider these rewards to be very attractive: “With the competitions the prize money I believe is very generous” (Local Motors contestant).The attractiveness can also be attributed to the fact that from the outside potential contestants were unable to perceive how difficult it is to actually win a contest. As a result of these attractive extrinsic rewards, many try out to compete in the innovation contests. A number of contestants then drop out after having not won the contest. Yet for a large number of contestants a shift in motivation takes place.

> “I’m an art student and I was putting up designs on Facebook and different websites and then they were telling me about how they knew about this site and they knew that you could get a pretty decent amount of money if you get something printed there and I was kind of making some of my own t-shirts at the time so they recommended that I go check it out. And then when I checked it out it kind of turned into me submitting a design once in a while and then I just kind of ended up getting more and more involved. I find it very addictive that site. So I think it’s just—it’s sort of just a hobby now”.

This is representative of the experience of many. While the initial motivation is often the prize money, as time goes on many participants realise how intrinsically rewarding the creative process is. They take their eyes off the prize.

Evoking intrinsic motivation

Attracting contestants that are already disposed to be intrinsically motivated is the first step, creating conditions under which the intrinsic motivation unfolds is the second. Two conditions are central in facilitating this process. Firstly, it is a necessary condition that the contestants feel competent (Sansone, 1986). This feeling leads to intrinsic motivation, so long as they sense their autonomy as well (Deci & Ryan, 1985). In community-based contests firm practices in conjunction with a functioning community can fulfil these conditions. This explains why recreational labour and the underlying intrinsic motivation occur.

Contestants that do not have a professional background in the relevant area and students often lack confidence in their skills. “It’s something that I certainly have always wanted to do, but I didn’t have the tools, the abilities or the confidence to do without the work that I have done with Threadless” (Threadless contestant). The contestants become more confident because of the various ways in which contestants receive feedback from the community and the firm. The firms have developed IT solutions to encourage and enable community members and employees to provide feedback to contestants on their entries:

> “Even though I haven’t had any training, the Local Motors team was willing to encourage me where I made good progress [in the contest], gently re-direct me when I was going in the wrong direction. That gave me a lot of confidence. I got the feedback and realised I am actually doing something that they think is right. A huge encouragement!” (Local Motors contestant).

On the most basic level, both firms have provided commenting functions on the page that shows the individual contest entry. This is typically used by community members to provide support and encouraging comments on the contest entries. These comments have a positive impact on individuals' confidence and perceived competence.

In addition, contestants can seek input from fellow community members through the general blog sections, as well as in dedicated work in progress areas on both websites. The scores for their contest entries as well as statistics on how they were scored are also available to contestants. In general, contestants describe the nature of the feedback they get as mostly constructive and encouraging.

> "Getting up to that point [of winning a contest] you know, it felt really good to submit illustrations or whatever, they were not the best you know, they weren't awesome, but to get feedback from people saying hey this is really good, you did a good job on this, this is funny or this is cool to look at or you know, I would wear this, that makes you feel good" (Threadless contestant).

Overall, the companies have created a feedback environment that positively impacts the perceived level of competence of the individual.

The prizes themselves have a positive impact on the perceived competence of contestants. Winning one of the contests increases the contestants' reputation in the community. Furthermore, winning is seen as recognition of the skills of the contestant and typically give them a large boost in confidence. The reason for this can be seen in the rigorous selection process that contest entries typically go through. Initially entries are scored by the community members. The firms then only evaluate the very high scoring entries. The firms choose among these highest scoring entries. As a result winning the contest is a reflection of both peer recognition by the community and commercial recognition by the firms.

Table 22: Building perception of competence

	Threadless case data	Local Motors case data
Firm practice: Creating feedback mechanisms	Threadless used the website re-design to further improved feedback mechanisms, aiming to take out self-promoting entries: "Well for that what we built in the forum is whenever you post a comment if you have designs that are in the running to be scored, they will be sitting there next to your name, like go score my designs. So that it most certainly will happen automatically and **your way of promoting is to engage in the community in an authentic way** and by doing so your designs will be promoted" (Threadless top management).	"The best thing I got in this place was good feedback. A perfect example would be in Checkups where I used to submit something and within a few hours I get feedback from members around the world. They download my picture, do a bit of Photoshop and upload it again, show me what can be done. **That kind of feedback is very, very hard to find. On many websites and competitions they never reveal other entries** until the results are out and this one is extremely open" (Local Motors contestant).
Effect: Perception of competence	"What is really, really good is when I first submitted until now I couldn't believe how many people would sort of start commenting on my work on the actual submitted page. How people who you don't know go on and see your work and say "it's awesome I love that". **It's good, it's great for anybody who is creative to kind of get that feedback** and have people on there saying they like your work its brilliant. It's great!"(Threadless contestant).	"The feedback from especially the community helped bring out the designer in me. I designed a pizza vehicle that was all business. But it was a design contest, so the community members really came out and helped me. **If you look through my designs, it really changed a lot. I felt like I really grew.** It was just so exciting. Even though I was not in the top ten, the personal growth that I had, made it worthwhile" (Local Motors contestant).
Firm practice: Recognizing artists	Threadless decides which designs to print within weeks of them being voted on by the community. Many of those are not available for sale for several months. **One new shirt design is released every day of the week** (Monday to Friday) **to recognize optimally the artists** that Threadless has decided to print.(Observation, November 2011 – April 2012*)*	"Let's **set up our own event** where we provide feedback to our alumni [winners]; **where they have chance to be recognised**. It will be for everybody but where we highlight the winners. There's the broad community, there're the winners within it and getting them the recognition that they richly deserve is the important thing" (Local Motors top management)..
Effect: Perception of competence	"It is pretty funny, you can usually tell when someone who has not been printed is printed. Usually it takes a few months, once they are told they are printed. You can't tell anyone before the shirt actually shows up. I've been able to get a few people because it is just their release of flurry of new designs. It is just a tonne of new designs. **As they are printed they are bolstered**. So their creativity and confidence increases" (Threadless contestant).	"I did not expect the first place. That was the most awesome experience in my life. Every one of the employees knew that design and they voted for that design. They explained to me, the managers there, how the voting went. So the management had a voting station, the engineers and designers. **Every department made their own decision and I was the first in every one of them! That was absolutely awesome**" (Local Motors contestant)

> "And then it was about a year and a half after I joined up in my first submissions that I got my first print and it was fantastic. You know, it was one of the greatest feelings ever getting that recognition that not only is the— my illustration you know well received but a company is willing to back it up with their money to make a product and then there is going to be all these people out there around the world that are going to buy it and want to wear it you know, it's a crazy feeling and it just encouraged me more to keep producing" (Threadless contestant).

So overall, innovation contests can provide a feedback environment that supports or even builds contestants' feeling of competence in what they are doing.

It might appear difficult to guarantee autonomy in innovation contests. The firms set boundaries and prescribe what they're looking for. Nevertheless, both of these firms manage to provide competitors with a feeling of autonomy. In line with previous research on intrinsic motivation, this autonomy seems to be the main driver of contestants' intrinsic motivation (Lepper & Henderlong, 2000). This feeling of autonomy is often reflected in the fact that contestants describe their designs as personal work. "It's just like personal work like, I always feel like its personal work when I am doing something for Threadless" (Threadless contestant). This perception can be attributed to two firm practices: the provision of creative freedom and the honouring of idea ownership.

Both companies recognise the importance of giving contestants autonomy in the form of freedom to design exactly what they want. The central element for giving contestants freedom is the 'contest brief' that sets out what the firms are looking for.

> "The community members are more motivated if they have more freedom, more control. The first place for people being in touch with a competition is the competition brief. You will feel through the competition brief whether you are inspired and motivated. That is the beginning of giving people freedom and making them feel motivated" (Community manager Local Motors).

In setting out the briefs for the innovation contests both firms try to set as few limits as possible thereby leaving the control what to do in the hands of contestants. If they can, the only limits they set out are in terms of production feasibility. For instance Threadless had to restrict the number and type of colours that contestants can use in their entries for a long time. To give contestants freedom, Threadless runs an ongoing contest to which contestants can submit whatever design they want, as long as it can be printed on a shirt, does not breach any copyright or is overly politically or religiously offensive. In this context Threadless often talks about their shirts as being a blank canvas that contestants can use for their design ideas. “That t-shirt is basically an open canvass that you can just do whatever you want, you got complete take of creativity“ or “complete creative control” as contestants describe it. For contestants having this freedom translates into intrinsic motivation and a recreational experience.

> “Working with somebody else’s vision, somebody else’s script, I do a lot better when I am not restrained like that. Again I think I am scared of it being more of a job, more of it being expectations on me to come to a specific results or specific vision of somebody else's and how can I do that, you know, that's pretty tough to do. But when I am working under my own rules, when I am drawing what I want to draw and my own vision it's just like playtime for me. It's— there is nothing that brings me more joy except for playing with my kids” (Threadless contestant).

Similarly, the firms recognise the importance of giving contestants freedom in order to motivate them:

> “I guess what I have to say for that is that the stuff that we are asking our community to do is much more just personal artwork. We are not saying here is a logo that we need under these specifications, here is the company name that you are designing for, here is what their needs are. It’s more like what do you think would be an awesome shirt that you would want to wear” (Threadless top management).

This creative freedom translates into a high intrinsic motivation for contestants. This effect can also be seen in the numerous descriptions of how working or designing for Threadless differs to design work that some of the contestants do in their day jobs.

> "Well, for me, when I started as a designer, at school I was studying graphic design at school and Threadless was an escape for me. Like, it was like I had to do, I had a job. So I had to do stuff for that. And then at school I had to do stuff for these projects. And they were so structured. But with Threadless, I could just kind of do what I wanted. Or do what I thought would be interesting on a shirt. And I, it was like just a whole different mind-set for me. And so, instead of having to like force myself to do one thing, I could just go off and do my own thing. And so it was like it was my escape" (Threadless contestant).

Similarly, Local Motors' early contests only restricted contestants by giving them at most a market to design for and some output requirements: for instance, create a car for Boston. The managers for contests described that a good contest brief is inspirational and motivational, but does not set many limits, giving the following example:

> "And so Terra Prix was much shorter and I felt I would take a risk with Shell to make it even shorter, more concise and just give them the background of the company who is sponsoring it and very concise briefing, some resources and that was it. […] I also made the requirements almost very, very loose because I felt that you just, let's see what people come up with. Let us not restructure the 4 wheels or 4 passengers or any of that, let us just say so the restrictions are 2 wheels, must be a ground based vehicle so no hovercraft or anything like that, must sit one passenger meaning there can be either driver and then place that. And then a couple of different views of your vehicle and that's it so very easy for people to enter, very easy for me to be able to approve entries" (Contest and community manager Local Motors).

Yet even when the firms run contests that were more specific (for instance, Threadless regularly runs design challenges on a particular topic called "Threadless loves") the companies place great effort in setting out the contest in a way that does not restrict creative freedom too much.

> "Even with the challenges they have a theme but it's so laid back. You can still do whatever you want. You can still do your own style. You can choose what colours you want. You can choose what subject you know for most part whatever you are

> doing I think that's what really makes it, you know, this creative part to it, I think, makes it fun" (Threadless contestant).

In this context, both firms put great emphasis on how they present the challenge and what language they use. One of the Threadless copywriters pointed out during a training session that when they run contests for specific companies, they will not phrase the design brief in a specific way. They will write an inspirational text to the community such as: "imagine you are at the beach…"

It is, of course, easier to give freedom in a contest for T-Shirts, which requires no specialist knowledge, than for vehicles. Community managers at Local Motors emphasised strongly how critical the contest brief is for motivating contestants: "Between the customer and the community, the company and the community there is a filter, there is us writing the competition brief. The more complex the competition the more you have to think about how will you give the competition brief". They often have to set-constraints. The community managers emphasise that the perception of contestants in these competitions very much depends on how they communicate the constraints:

> "If I tell you just draw a race car, that will be fun and you're not very constrained, don't care about aerodynamics just make something that looks amazing. You will have part of the community that will be very intrigued and draw stuff. And maybe these people will not be very happy if you tell them you have to respect the regulations for Le Mans, but at the same time if you do it well to introduce the regulation for the Le Mans in a funny video or if you have a 3-D model or anything that is easy to digest for people, you will have people meeting the requirements. Some people are just very happy about the challenge in itself. It is about how you introduce the constraint. "

The community managers emphasise that it is about educating contestants as to why there is a need for constraints and making them as understandable as possible. In the case of the Peterbilt competition, they created a 3D model; in the case of the Domino's competition, an elaborate video on how a Pizza delivery vehicle is used. This finding is in

line with earlier research (Koestner et al., 1984) that constraints, if presented in an informative rather than prohibitive way, will not decrease the autonomy of individuals. To create the perception of autonomy, the firms not only make constraints understandable, but also explicitly point out where contestants can be creative. For instance, for Peterbilt Local Motors showed contestants how they could change the position of the cabin or modify the length of the truck.

The autonomy in and personal nature of creating contest entries is also driven by how the firms treat the ownership of the contest entries. Both companies put great emphasis on honouring ownership of ideas and giving credit to the creators of contest entries. They strongly emphasise that the ownership remains with the contestant up until the point that they are appropriately compensated by the firms. Contestants at Local Motors that win a contest initially receive a monetary reward for winning the contest. With winning this prize they do not give up intellectual property on their idea. If the company decides to use a design or engineering solution commercially, they will buy the intellectual property from the contestants. Local Motors places great emphasis on the fact that all submissions are governed by the creative Commons license, a license that is also used in open source software.

Table 23: Creating feeling of autonomy

	Threadless case data	Local Motors case data
Firm practice: Creative freedom	"That's always been sort of our thing. **We are setting guidelines in the [Threadless] "loves challenges"** and increasingly with the partner challenges, **but that has always been a small part of the big picture**. We would like to push the idea that you do something because you like it and if you think it is cool and other people that would give money for it, **we are not like looking for anything specific**" (Threadless community manager).	"Every competition has the potential [of being fun]. **Some competitions have a lot of potential** by themselves because they are fun right away. **Because we are saying make a race car and you are totally free to do whatever you want.** Sometimes competitions are more complex and you have to think what is the fastest and easiest to communicate all the constraints to the people. […]Take all the constraints and make them digestible that is the first big important step, make them understandable, why do you have these constraints." (Community manager, Local Motors).
Effect: Feeling of autonomy	"I think mainly because I get home and like I don't have to work on someone else's idea. You said I give my own ideas and I am like, oh, it's there I am going to draw what you like, you want, you know. Like it doesn't have to be, like, okay, I got to go draw this specific person or characters**. I think this is like I am going to go and do just whatever I want**" (Threadless contestant).	"They gave us the possibility to change the place of the cab within some boundaries, large I think for a truck. They gave us the possibility to move the engine towards the front or towards the end of the chassis. They let us modify the height of the cab between some boundaries. They gave us these possibilities. **If they would not have let us change the engine or the cab position, I would have thought it is too much restriction for us**" (Local Motors contestants).
Firm practice: Honouring ownership	"**They [Threadless] get authorisation from you to print on anything. It is not like other companies where they give you money and then they say: "It's ours!** Just shut the f… up. We will give you money…maybe we will, maybe we won't—now it's ours!" They don't treat you like that! They'll always ask! If you want to opt out your design on something, we'll honour this! You are more in control than with many of the other companies I have dealt with."	Community members had realized that somebody had taken a community member's design and was selling it on another website as a CAD model. The CEO called a meeting with the internal designers and community managers. They agreed to defend the community members' interest. **They decided to contact the guy who 'stole' design and point out that designs cannot be used without the permission of and credit to the creator.** (Observation 9th of February 2012).
Effect: Feeling of autonomy	"Well, it is empowering, letting you keep your own work. […] So, like, if you're a working artist. If you're, like I am, like a freelance artist. And depending on it for your income. Then that means a lot. Right? **It's important to have control over your art, you know**".	"When I took the prize I had to sign a paper between me and Local Motors as competition organiser. If they want to use my design, they have to talk to Local Motors as a representative for me. **So they don't own my design and Local Motors is some kind of lawyer for me.** They recognized it is my design, they do not claim it theirs" (Local Motors contestant).

Similarly, Threadless protects the intellectual property of their contestants. Once they submit a design to Threadless they agreed to give the company two months to decide whether it wants to produce and sell the design or not. If they do not decide to produce the design within that period, the design falls back to the contestant. If they decide to print it, Threadless buys the rights from them, but gives royalty for every reprint they do of a shirt. Furthermore, they only take the rights for the use as a T-Shirt which means that the designers are free to use the design for other purposes such as art prints and sell them themselves.

> "Everything that I have drawn for Threadless it's not Threadless but it's mine, you know whether they selected it or not. Only Threadless gives you full rights to your picture beyond T-Shirts, you know, it's my pictures, it's my illustrations, it's my vision and they are just giving me money for the rights to put it on a T-Shirt and I get to still sell Wall Prints for it or whatever and I do. And it does make a big difference because, honestly, on the few shirts that I have sold to other companies and then I have realised after the fact that they own that picture now you know, the only way that I can utilise it is in my portfolio and it's kind of a bummer you know. I am the kind of guy, I have got every original piece that I have ever done on my portfolio, you know I don't let anything walk out the door".

In both cases, even if the firms decide to commercialise a contest entry, they typically prominently acknowledge the contestant that created the entry. For instance, each Local Motors vehicle carries a badge of the name of the designer. Each Threadless shirt has a label with the artist that created it.

> "But I think I'm getting better at that and again as I say that's part and parcel of the beauty of Threadless is that you are creating work that, yes, Threadless might pick it up and they might print it but it will always be my work and that's another big pulling part with Threadless is the fact that they do obviously give the designer the full credit for the design, the copyright is in my name. They have got the right to print it on T-Shirt and I've got to the right to print on everything else. It's a fantastic relationship in that sense so that's why I'm hooked".

As a result, even after the entries are being taken on by the firm, contestants still regard their entries as personal work.

The role of extrinsic rewards

The literature review has shown that extrinsic rewards often negatively impact or even undermine intrinsic motivation (Deci et al., 1999). Consequently, discussing intrinsic motivation in the context of innovation contests, a concept that is closely associated with extrinsic rewards, raises the question why the extrinsic rewards in these cases are not undermining intrinsic motivation. We can identify two different kinds of extrinsic rewards in community-based contests. First, the aforementioned prize money and the status that comes with selection. Secondly, the recognition by other community members, particularly members who are highly regarded in the community.

The prize money fulfils some characteristic of an extrinsic reward that would undermine intrinsic motivation. It is a monetary reward given to the contest winner. Yet. at the same time, it also has characteristics associated with extrinsic rewards that do not undermine intrinsic motivation. As shown above, it is not given out merely for submitting or completing an activity, but only to the highest scoring designs that also have passed the selection process. It is a sign of competence. More importantly, the chances of getting the prize are very slim. For contestants of all experience levels, even those with previous successes, winning a contest comes as a surprise:

> "I got printed with my 159th design to be exact! I think it's some kind of a record on Threadless to be printed for a first time after so many designs. It's not really something I'm proud of, I would rather have less designs and more prints, but I'm aware it's really hard to get picked for a print since there are so many designs that deserve to be printed. So I'm definitely proud of that print, persistence pays off for sure! It felt like I've won an Oscar, Emmy and Nobel Prize at the same time, it was something I was really really striving for and when I got it, it was a blast!" (Threadless contestant).

Contestants emphasise that they strive to get selected, but that this outcome can never be expected. Many of them also feel that the focusing on winning the contest will limit creativity and they will not be able to eventually succeed. If winning comes as a surprise, then extrinsic rewards do not undermine intrinsic motivation. Similarly, if we categories recognition by other community members as a verbal reward, then such recognition is unlikely to undermine intrinsic motivation as it is less predictable.

Furthermore, there were changes in the relevance of intrinsic motivation and extrinsic motivation over time. Contestants reported that once they had won a contest, the extrinsic rewards became more important. As I have described, a reason that extrinsic rewards do not undermine intrinsic rewards is that winning to most seems initially impossible to attain. Once contestants have won winning again becomes more attainable and contestants focus more on the extrinsic rewards. Contestants still reported intrinsic motivation, but also highlighted that they were focused on winning again.

Evidence on the limits to recreational labour and intrinsic motivation

The vast majority of contestants interviewed described that they were intrinsically motivated. This is not surprising given the low chances of winning relative to the amount of work required. Individuals who do not feel the intrinsic motivation in creating contest entries are more likely to drop out. This means when interviewing active contestants there is a natural bias towards those that are intrinsically motivated. Nevertheless, I also found

a number of contestants that were less intrinsically motivated or were competing for different motives.

Certain styles of designs are more popular and successful than others in the contests. For instance, a style that was defined by community members as pop art. (relatively simple designs with a funny message) is one of the most popular on Threadless. At the same time, most of the contestants claim to have their 'own' style. The intrinsic motivation of individuals is related to creating an entry in their style, something that reflects their personal choices. If contestants feel that their style does not do particularly well on Threadless, some of them change their style to what they deem popular and successful. Yet, this also changes their view of the activities they perform to create a design:

> "But then also with Threadless my personal artwork is really different from the stuff I produce for Threadless. Just because I know that if I just put up something that I'm like, 'hey, this looks cool, I enjoy making it, maybe it has some meaning to me.' I know that's not going to do well on Threadless. So when I'm working for Threadless it's not my favourite art to work on, but I mean it definitely beats working at a grocery store" (Threadless competitor).

This lower level of intrinsic motivation is driven by lower autonomy. If they cannot design in their style, but feel they need to adopt a 'Threadless style' to be successful, this style becomes something that limits their choices and constrains them in creating their contribution. On the other hand, there are those contestants who do not care if their style is not as successful in the contest. Staying true to their preferences they still have a high intrinsic motivation.

In addition, some contestants never become intrinsically motivated as they simply lack the skills to create successful entries. As shown above, the feedback mechanisms are a great way of building up confidence for those with talent and those that are learning and improving. Yet while the communities' feedback is generally constructive and positive, it is also honest. Work that is not up to standard or contestants that seem not to make an effort to improve will get feedback reflecting these facts from the community. These comments will not increase the perceived competence and intrinsic motivation of the contestants.

> "I tried to stay realistic and grounded as far as getting printed and humble, you know, but it is that discouragement when you feel like you have been proved and you feel like this piece of work should do very well because of what you are seeing in it and then you submit it and the score comes in and it falls flat with the voters and then you kind of get this frustration or you are like you know, when I wasn't worth it but it short lived with me and it short lived with most though. Although some of them don't get past that and you don't see them show up anymore" (Threadless contestant).

Similarly, intrinsic motivation also depends on the individual perception of what autonomy and freedom in creating contest entries means. Some people feel free to be creative even if several constraints are given, others only if no constraints at all are set. These perceptual differences are, to some extent, related to professional background and training, as can be observed in the Local Motors' community where both engineers and automotive designers are active:

> "It also depends on the crowd you are taking, most of the designers would like to start from a blank sheet of paper and do the stuff they have in mind. They won't accept any compromise, hardly take any critics to deliver the project. Usually asking engineers to start from a blank sheet of paper is the best way to get nothing out of it" (Community manager Local Motors).

Across the three groups of contestants enthusiasts, professionals and students, there were differences in motivation. Enthusiasts and professionals were the most adamant in pointing to the self-indulgent nature of creating contest entries. While some students reported that creating contests does not feel like work, they also often highlighted that for they were driven by learning and development, the other form of intrinsic motivation that I highlighted in chapter 4. For them participation was often more of a stepping-stone to entering a design school or finding a job.

While for most professional contestants creating contest entries is a recreational activity, some take it on as full-time work. Particularly in some Asian countries, designers can make a living out of competing in the contests. The high prize money associated with winning provides them with significantly higher earnings than the much lower local wages. “There are a couple of people who can live off what they do on Threadless. And if you can do that it is an amazing thing! It is most likely going to increase with Threadless providing more and more opportunities to get printed” (Threadless contestant).

At the same time, the growth of the companies can challenge the recreational nature of the contests. To grow beyond their niche, both companies increasingly work with large corporate partners, which impacts on the autonomy of the community. These partners often look for more specific results that they want from the innovation contest, for instance, a vehicle for a certain situation or a t-shirt design for a specific movie:

> “Back in the days we were not speaking with big names like Shell, BMW and other places and so we were running competitions more or less for fun and it was our own expense, we were not paid by a customer to run a competition so we were

> free to do whatever we wanted. Now writing the competition brief we have less freedom. We have been more constrained by the customers who ask us, make that happen, make that happen. That affects the freedom and motivation cycle" (Local Motors community manager).

Despite all the efforts on the side of the firms to preserve autonomy, the perception of autonomy, at least for some of the contestants, is decreasing. For instance, interviews revealed that some of the contestants felt that working on a challenge for a partner of the company was more like work than for other contests.

> "Threadless is doing lots of contests where they are pairing up with Disney and they are doing stuff like Ironman and specific things which I think is very limiting and once again it is tailored more to the consumer. They used to have the more creative contests where it was not about replicating just somebody else's property. It was just encouraging you to go with original thoughts. They still encourage that, but it seems to be shrinking a little bit. [In these new contests] they say design something based on Toy Story and then there is all these rules: You can't combine it with anything else. You can't make fun of that kind of stuff" (Threadless contestant).

As firms give up freedom and autonomy in engaging with partners, there is the risk of not being able to pass on sufficient autonomy to the contestants.

6.6 Discussion

Most research on the design of innovation contests has focused on creating prizes and managing the number of contestants in such a way as to motivate individuals to put effort into the contests and provide great ideas to firms (Boudreau et al., 2011; Schöttner, 2008; Terwiesch & Xu, 2008). An underlying assumption of this view is that the participation and the creation of the contest entries is not inherently rewarding enough; or, in other words, that contestants will not put in effort to create meaningful ideas without a sufficiently large enough prize and significant chances of winning it.

This chapter offers an alternative perspective in which the prize might not be the most central design element in the innovation contest. Participating and creating contest entries can become a form of recreation for contestants. In this case, firms profit from what I have termed as recreational labour. A large number of contestants create potentially valuable contest entries for the firms, without considering the prize and their chances of winning. The reason for this is that creating entries in an innovation contest in this situation is an intrinsically rewarding activity. The intrinsic motivation is a result of how the firms design the innovation contest. Attracting members with a disposition for intrinsic motivation is the first step. Subsequently, giving contestants a feeling of competence and confidence in what they are doing is a necessary condition. Embedding the contest in a community with feedback mechanisms, as well as using the prizes as signs that reaffirm competence, is a way firms can achieve this. At the core of eliciting intrinsic motivation, is the ability of companies to preserve a feeling of autonomy for the contestants. Despite the fact that a useful innovation contest needs to have clear boundaries and a clear brief, firms need to find ways to make contestants feel that they are masters of their own destiny and creating personal work. As such, my research is the first that points to the importance of autonomy in contests for the development of intrinsic motivation. Furthermore, in terms of contestants' characteristics my research widens the focus from just focusing on the level of skills that contestants have to the importance of their interests and dispositions with regards to the domain of the contest.

This chapter not only highlighted the existence of intrinsic motivation in innovation contest, but also the contest design conditions that need to be fulfilled for

intrinsic motivation to emerge. I based these conclusions on self-determination theory (Deci & Ryan, 1985). As such it initiates a more contingent perspective on motivation in and design of innovation contests.

First, the ability to create intrinsic motivation depends on the domain of knowledge the innovation contest takes place in. People across the globe are passionate about car design, automotive engineering or simply drawing and 'doodling' as Threadless contestants used to call it. These passions form the underling basis for the intrinsic dispositions for Threadless and Local Motors. Intrinsic motivation occurred when the firms created the right conditions. While research has hinted at many other areas where such passions are present, such as sports equipment, programming or musical instruments (Baldwin et al., 2006; Jeppesen & Frederiksen, 2006; Shah, 2006), it is likely that not every domain necessarily has individuals with an underlying passion and thereby an intrinsic disposition.

Secondly, for giving individuals the feeling of competence the community played a key role in giving individuals the feeling of competence. While the firms created feedback mechanisms, setting the stage for a feedback environment, the community members essentially were the ones that provided most of the feedback through voting, commenting or blogging. As I showed in chapter 4, community-based innovation contests create an ideal setting for learning and thus also for building contestants' confidence. Even though intrinsic motivation can develop if contestants already join with a perceived high competence, or build it from their contest experience alone, without an encouraging community eliciting intrinsic motivation seems more difficult.

Lastly, the level of autonomy that firms can give in an innovation contest will very much depend on the type of contest. The Threadless like openness 'do whatever you want as long as it fits on a shirt' is more difficult to realize in more focused innovation contests, such as those found on Innocentive, where firms seek to solve very specific scientific challenges. In this setting, recent research on innovation contests has emphasised that firms need to write very specific briefs in order to get what they want (Jeppesen & Lakhani, 2010). Based on my findings doing so might come at the price of undermining intrinsic motivation, thereby increasing the necessary prize that firms have to offer. Only if firms provide sufficient freedom for contestants, do they benefit from the extra effort those contestants put in when they are intrinsically motivated. As such, my research suggests a trade-off in innovation contest design between providing sufficient autonomy and setting specific contest briefs. Social psychology experiments offer a way to overcome this trade-off as they have shown that the feeling of autonomy can be created in different ways, often by giving just simple choices to individuals (Cordova & Lepper, 1996; Iyengar & Lepper, 1999). In this context, Local Motors is a good example. Despite the more complex and more constrained nature of their contests, they manage to create the feeling of freedom for contestants. They focus on educating their contestants on constraints, aiming to make them as easy to understand as possible: for instance, by creating videos or 3D models. Furthermore, they clearly point out the freedoms that contestants have, such as changing the position of the cabin on a truck. Future research should explore alternative ways for creating the feeling of autonomy in innovation contests.

My research offers an interesting addition to the debate on the relation between intrinsic and extrinsic motivation. Overall my findings support previous research on intrinsic motivation that highlighted perceived competence and autonomy as the central conditions for developing intrinsic motivation (Deci & Ryan, 1985). Nevertheless, a lot of research has focused on the potentially damaging effects of extrinsic rewards for intrinsic motivation (Deci et al., 1999; Kohn, 1996; Tang & Hall, 1995). To some extent my research actually counters this finding. My findings show that extrinsic rewards can actually lead to intrinsic motivation. Extrinsic rewards can be important for luring individuals into an activity that only then itself becomes intrinsically rewarding. I show that focus can shift from extrinsic motivation to intrinsic motivation, working in the opposite direction to what research has emphasised so far. Contestants in innovation contests are attracted by the high prize, but subsequently become intrinsically motivated. This happens because it is not initially clear to contestants how difficult it is to attain the reward. As they get involved in creative activity a shift takes place. While they realise that the extrinsic rewards will be difficult to attain, they also start to enjoy participating in the contest. With this movement, the shift in focus from extrinsic to intrinsic takes place.

Perception of autonomy is a central element of self-determination theory. Most research has understood the autonomy for intrinsic motivation mainly as to the capacity to make choices about what you are doing (Cordova & Lepper, 1996; Iyengar & Lepper, 1999; Langer, 1975). While this is also true for my data, my concept of autonomy seems slightly broader. The autonomy of contestants also comes from the fact that what they feel that they are carrying out personal work. No matter what happens to their creation subsequently, it will be ‘their’ creation, which means they are doing something for

themselves. This heightens autonomy and makes the activity inherently more enjoyable. By honouring ownership, the firms ensure that contestants continue to feel in control of their work, and so preserve intrinsic motivation.

On another level, my research provides insights into the firm and the changing nature of work with the use of online technologies (Kittur, Smus, Khamkar, & Kraut, 2011). In both of my cases, the community-based contests replace activities that have traditionally been done inside the firms. Car design and engineering are core functions of automotive OEMs. Similarly, shirt design is typically done in-house by clothing firms. In my cases, both companies rely on community-based innovation contests for performing these functions. None of Threadless shirt designs are done in house. All of Local Motors vehicles were designed by the contestants. With the shift of these activities to outside the firm also the perception of the labour inputs for the firms change. While for those inside the firms these activities were typically regarded as work, in the form of community-based contests they have become recreation. This happens as the firms create different conditions in these contests than they would typically do for employees. They use a payment model that is based on output. Inside the organization they will pay for every shirt or car design that is created, outside they only pay for the design they select in the contest. Furthermore, because selection of contest entries is done based on output, the firms can let anybody participate regardless of background and experience. As such. moving activities outside the firms into contests enables firms to provide more autonomy. At the same time, because of the contestants' intrinsic motivation and the recreational nature of the work, the effort put into entries, or the number of entries they receive, is not

conditional upon the size of the payment. This leaves firms with most likely better and more entries to choose from.

The idea that firms profit from hobbyists is not entirely new. In the case of a firm-hosted community for computer-based musical instruments members were found to participate because they used this software as a hobby (Jeppesen & Frederiksen, 2006). The hobbyists developed the firms' software primarily to satisfy their own needs as the lead users. The features were taken on by the firm if they proved interesting. Yet, in this case, the online community did not replace the software development done inside the company (Jeppesen & Frederiksen, 2006). In the case of Threadless and Local Motors, the firms systematically use recreational labour instead of internal departments. The community-based contests have become part of these firms' value chains. Contestants are not lead users of, for instance, T-Shirts and do not develop products out of their personal need (Von Hippel, 1986). They create the entries because they enjoy doing so and want the firm to produce their ideas.

Recreational labour focuses on contestants' perception of their work in innovation contests for firms. As I have shown, contestants do not perceive the activities they are doing as work, but as a recreational activity that is fun to carry out. From the perception of the contestants participating in the contests is comparable to other recreational activities that they carry out like playing games or doing sports. Similar perceptions of activities have also been found in the context of open source software. Open source community members have been found to enjoy programming software (Lakhani & Wolf, 2003; Shah, 2006). They often do it in their spare time and bring skills from their day jobs

to the task (Kogut & Metiu, 2001). From this perspective open source community members are creating a product and perceive this creation process as recreation. In this respect open source software programming is similar to recreational labour as are lead user communities (Baldwin et al., 2006; Jeppesen & Frederiksen, 2006). The difference comes when looking at the overall model. With the exception of some firm-sponsored communities, open source communities are independent from firms and self-governed by community members (O'Mahony & Ferraro, 2007). These community members structure the tasks and manage the development process (Langlois & Garzarelli, 2008). In fact a lot of motivation for open source participation comes from it being a social movement and an alternative to the traditional firm model (Hertel et al., 2003). In contrast, recreational labour is the perception of activities that are done for the firms and largely structured and managed by the firms. Firms set the tasks that contestants are doing and provide the environment that these are operating in. They manage the overall process, e.g. select other firm partners, define deadlines and take a key role in evaluating outputs and deciding on which product ideas to produce. All contestants are aware that the firm does these contests to sell products that generate a profit. The new idea about recreational labour is not the contestants' perception, but that this perception is created by the firm for activities that they manage and that make up an integral element of their value creation process.

This research has focused on innovation contests, but the concept of recreational labour is likely to be relevant beyond just these contests. Over the last decade we have seen companies starting to increasingly give activities to the wider public that were previously done inside the firm (Afuah & Tucci, 2012; Howe, 2006; Poetz & Schreier, 2012). Firms have made use of the wider public for a variety of tasks ranging, from

character recognition for not automatically recognizable scanned words, to supplying content for product review sites or newspapers, such as the Huffington Post. Further research could explore to what extent recreational labour exists or could be implemented in these settings.

Firms are struggling in engaging online communities and contestants for their innovation activities (Bayus, 2013). My research has important implications for them. The results of the research show that the focus on the prize in innovation contests for firms and researchers might be misplaced at times. The experience of contestants in participating in these contests might be more important, as it is what ultimately drives their behaviour. This has strong implications for firms as they must invest in the people's experiences while creating entries, rather than just setting higher prizes to bring up motivation and engagement.

My findings suggest that some of the activities that firms are implementing might actually be counterproductive. As prizes in these contests are limited, and only apply to those that create an entry, but not those that do other activities such as vote or give feedback, many firms are considering creating alternative forms of prizes and recognition. One of these is ‘badging’ creating virtual badges that are awarded to community members and contestants for activities such as voting or for submitting a certain number of entries by contestants (Antin & Churchill, 2011). These members can then put these badges on their virtual profiles. Based on my results, this might be a counterproductive move. Intrinsic motivation can develop in my cases because the extrinsic rewards do not undermine it. The chances for prizes are slim, verbal praises by community members are

unpredictable and all these rewards are given only for high achievement. By increasing the number of prizes and recognitions, giving them for doing activities, rather than the achievement of great quality, firms might actually undermine the contestants' intrinsic motivation (Tang & Hall, 1995). As previous research suggests, as extrinsic rewards become more prevalent, they become the focus and the objective of those doing the activity (Deci et al., 1999).

Research on the role of firms in innovation contests has previously emphasised the importance for the firm in making a problem understandable and shareable so that it can be solved by contestants (Sieg et al., 2010; von Krogh et al., 2012). I extend this perspective by pointing to the importance of defining a problem broadly enough to give contestants sufficient freedom and elicit intrinsic motivation.

6.7 Conclusion

This chapter makes a number of contributions. First, this chapter shows that intrinsic motivation can be an important motivator of contestants in innovation contests.

Secondly, it shows that contest design elements go beyond the prize and figuring out how to admit contestants is important. Contestants' feelings of competence and especially autonomy in participating in contests are vital for the emergence of intrinsic motivation. As such, my research highlights that competence-enhancing elements and providing contestants with sufficient freedom are important design elements of an innovation contest. At the same time, while previous research has focused on attracting contestants with the right skills, my research points to the importance of also finding contestants with the right interests and intrinsic dispositions.

Thirdly, my research shows the effects that intrinsic motivation has on the contestants' perception of the activities that they are doing for the firms. I introduce in particular the concept of recreational labour. It is thereby one of the first research projects that understands the perceptions of individuals involved in firms' innovation activities online.

Lastly, my research shows the applicability of self-determination theory to innovation contests and extends it. I demonstrate the role of extrinsic rewards as inducing contestants to try out contests and become intrinsically motivated. It extends the concept of autonomy to include the honouring of ownership of ideas.

Chapter 7: Discussion and Conclusion

7.1 Introduction

In this last chapter, I highlight and discuss the key findings and contributions of my study as well as its implications for future research, policy and managerial practice. I start out by focusing on the main points of the three empirical chapters. I then compare the three empirical chapters, pointing out differences, similarities and connections between them. The section that follows highlights my contributions to innovation management. The contributions that my thesis makes are not limited to this field alone. The wider implications of my dissertation are presented in the subsequent section. I then turn towards a discussion of the limits of my approach, pointing out its strengths and weaknesses. The chapter then turns to methodological, managerial and policy implications resulting from my research. Before concluding, I highlight some further avenues for future research that arise out of my study.

7.2 Research contribution

In the last decade, the number of studies which focus on firms involving members from the wider public in their innovation efforts using the internet has increased hugely (Nambisan, 2002). While research has largely focused on the communities, community members and the contestants that participate in online innovation contests (Boudreau et al., 2011; Jeppesen & Frederiksen, 2006), the role of firms in this collaborative process has been left unexplored for the most part (Porter & Donthu, 2008). In this study I set out to understand the question: How do firms engage online communities to participate in innovation contests on an on-going basis?

The three empirical chapters that I have presented provide different, but complementary answers to this question. The first of these looked at the relation between innovation contests and the firm-hosted community. It demonstrated that firms which make the strategic decision of adding a firm-hosted community to innovation contests can create learning benefits for the contestants. They can thereby motivate them to participate regularly in the innovation contests. The second empirical chapter looked at the relationship between the firm and the firm-hosted community. It showed porous boundary and community support practices can make community members not employed by the firm nonetheless feel part of the business. As firm membership becomes part of the social identity of the community members, they contribute to the firm. The third empirical chapter showed that firms can design contest environments that elicit intrinsic motivation for participating in the innovation contest. By encouraging intrinsic motivation, firms can make participants contribute more than if they relied on extrinsic rewards alone. At the forefront of my research were community-based innovation contests. These are a so far little understood hybrid phenomenon through which firms can involve members of the public in their innovation efforts (Bullinger et al., 2010; Hutter et al., 2011). Firms use the innovation contests so that contestants create a variety of contributions to the firm. They then select the best entries. In traditional innovation contests contestants would typically not interact. However, in community-based innovation contests firms invest in developing firm-hosted communities in which contestants and other members can socialise. These community-based contests create a learning environment in which contestants can develop their skills and become valuable contributors to the firm. In this learning process, the contest and community complement each other in facilitating experiential learning.

Contestants that participate in the community can learn significantly more than they would have done through contest participation alone. The contests provide the contestants with concrete experience conveying to them the demands of creating submissions for the firm. The community helps participants to reflect on their own experiences and learn from the experiences of other contestants. Exchanges with experienced contestants help newer members understand the underlying principles of making successful submissions. Lastly the community provides a safe arena for contestants to try out new ideas and prepare for future contests. It is because of this learning environment that community-based contests induce contestants to come back and participate on a regular basis to learn more. How much contestants learn depends very much on how much effort they put into their entries. As a result, the contest prize becomes less relevant as they are motivated by the desire to improve.

Members of firm-hosted communities contribute as they feel as though they are an active part of the company. As predicted by social identity theory and research, once organisational membership becomes part of the individual's social identity, this leads to changes in behaviour towards the organisation (Terry & Hogg, 1996). Individuals behave according to the organisation's norms and aim to support it (Tyler & Blader, 2000). I have shown that firms can actively establish practices that make external members of firm-hosted communities feel part of their business. They can develop a positive social identity composed of three things: feeling part of the firm, viewing the firm in a positive light and feeling valued by the firm. Two different sets of firm practices achieve this result. Porous boundary practices allow community members to consider themselves members of the business. These practices include hiring from the community and openly sharing

important firm decisions with the community. Community support practices make community members feel valued by the firm. Examples of these practices are involving top management in the community or the sponsoring of community projects by the firm. Both sets of practices create a positive view of the firm. This in turn generates a positive social identity that leads to repeated engagement for the firm.

Despite the fact that contestants perform tasks for the firms that would be regarded as work inside the firm, if firms create the right contest environment, participants do not feel as though they are actually doing work. Given the right circumstances and contestants, firms can elicit the intrinsic motivation of the contestants. Self-determination theory provides a useful lens for showing how these firms elicit intrinsic motivation (Deci et al., 1999; Deci & Ryan, 1985). Accordingly, the first step for this to occur is to attract contestants that have an intrinsic disposition. Companies can achieve this aim by being open to individuals of all skill levels that believe they enjoy an activity, but also by attracting extrinsically focused contestants through attractive prizes. A lot of members initially drawn towards the contest by the extrinsic rewards undergo a motivational shift. Even though they realise that winning a contest is difficult, they nonetheless still enjoy creating entries. The second condition under self-determination theory is feeling competent enough to perform a particular activity. Using community-based contests, firms can create a suitable setting for participants to gain such confidence in their abilities. The learning and feedback processes described above help create confident contestants. However, the most important condition for the development of intrinsic motivation is a feeling of autonomy (Ryan & Deci, 2000b). Contestants only feel autonomous if contestants feel they are in control over what they are doing and how they

are doing it rather than executing a task that has been set and defined by the firm. Firms can develop this feeling through setting and communicating the contest requirements in a particular way. Running open contests or pointing to dimensions that can be changed if narrower requirements are needed are two ways of allowing for autonomy. Leaving ownership of ideas with contestants is a further element of creating autonomy. As contestants feel they are not doing work when participating in the contest, they spent more time on contest entries and also participate on a regular basis.

This synthesis of my project shows that the three empirical chapters have provided complementary perspectives on how firms engage online communities in contests on an on-going basis. I will now point out some of the differences and relations between the three chapters.

7.3 Connections and comparison across chapters

All three chapters have focused on different aspects of how firms can engage contestants for their innovation contests. The first chapter concentrated on how combining contests and community work together to motivate contestants through learning. The second empirical chapter examined the relationship between the firm and the community and its positive impact on engagement. The third chapter looked at how to design contests so that they elicit intrinsic motivation. Together they confirm for innovation contests what research for innovation communities in open source software development has already established. The reasons for participation are multifaceted. Individuals participate because they feel part of the firm and they enjoy creating contest

entries. Certainly not all contestants have all of these motivations. Indeed, my research showed that for most a number of motivations were at play. For instance, some contestants emphasised the learning, the fun of creating entries and their relationship with the firm as motivators for their participation. Others had relatively little involvement in the community, so they did not have the same close relationship with the firm. Nevertheless, these contestants shared the view that creating entries was not work and described their intrinsic motivations for creating contest entries. Those with little competence were especially motivated by the desire to learn.

All of these motivators are internal to the individual rather than external. Learning happens internally and changes the individual. Social identity is a social psychological phenomenon that is part of an individual's personality. Social identity influences behaviour from within. Lastly, self-determination theory focuses on how individuals develop intrinsic motivation from a task they perform. As such in these three chapters, I have identified and explained three different types of intrinsic motivation that are at play in innovation contests. This focus on intrinsic motivators is a strong contrast to previous research on innovation contests that has emphasised extrinsic motivators (Taylor, 1995; Terwiesch & Xu, 2008). At the same time my focus does not negate that extrinsic motivators are important factors in contests. The prizes and, often more importantly, the recognition that comes with winning were important motivators. The extrinsic rewards also have an importance for intrinsic motivation as shown in the chapter on recreational labour. Extrinsic rewards are important for attracting contestants that subsequently also become intrinsically motivated. Nevertheless, contestants recognised that the chances of

winning such a contest were very slim. This fact results in a selection effect: individuals who are intrinsically motivated remain while those focused on the prize leave.

Another commonality amongst the chapters is the fact intrinsic motivation is not something inherent to innovation contests. This observation explains why previous research has focused on the extrinsic drivers. All of the intrinsic motivators presented were a result of how the firms holding the contests designed the approach and the individual contests. Through sponsoring and supporting a community, the firms created an experiential learning environment for contestants (Kolb, 1984). Their openness to the community and their desire to listen to their ideas and wishes led to community members identifying with the company (Tajfel, 1974). The effort they put into the contests ensured that participants had sufficient freedom. They were therefore intrinsically motivated to continue to create entries (Deci & Ryan, 1985).

A central difference between the chapters is the focus on who can be motivated. The learning experience and the recreational nature of creating contest entries are only available to those that participate in the contests. To profit from the freedom in the contest or learn about creating entries being a contestant is important. The changes to social identity affect the entire community. Beyond contestants this includes community members that are part of the community e.g. through voting or blogging, but are not creating their own contest entries to the firms.

There also exist important connections between the chapters. In line with self-determination theory, feelings of competence are a necessary condition for feeling intrinsically motivated. The experiential learning environment supports the development of this feeling of competence. Learning about creating contest entries is a central purpose

of the community. Without it these communities would most likely not exist. Similarly, if the community did not exist the firm would not be able to create the joint firm community identity. Only because the firm has an equal partner like the community to interact, share information with and respond to is it able to make the community members feel part of the firm. As such, the community is a prerequisite for creating a positive social identity. In addition, the freedom that the firm gives to contestants in the contests is also important for learning. The opportunities for learning diminish greatly if participants do not have the creative freedom to try different techniques and designs in the contests.

7.4 Contributions to innovation management

In the literature review of this thesis, I have given an overview of previous research about how to involve the wider public in the innovation efforts of firms, using contests, firm-hosted communities or the hybrid of community-based innovation contests. Despite focusing on community-based innovation contests, my research also provides insights that will be helpful in understanding pure firm-hosted innovation communities and stand-alone innovation contests.

Previous research on involving the public over the internet in innovation has focused mainly on what happens outside the firm in the community or amongst contestants (Dahlander & Frederiksen, 2012; Jeppesen & Lakhani, 2010). As a result, we have some knowledge of what contestants or community members want, but hardly any of how firms can provide it (Porter & Donthu, 2008). My research changes that. My research has offered a firm-level perspective observing the work that the firms do on a day to day basis to engage a community and create stimulating contests for them.

Inductively exploring this work through interviews and on-site observation over several months has provided an insight into the multitude of firm-level practices that are available and needed to make the collaboration with outside individuals work. I have shown that firms need to take an active role in sustaining the engagement of contestants. To interact with the public for innovation purposes, a firm needs to be active on different levels starting from selecting the appropriate approach, managing the relations with the community on a day to day basis and creating contests that are valuable to the firm, but support the contestants' wish for recreation.

Furthermore, my research has combined online and offline perspectives. It has demonstrated that to be successful online, many elements have to work offline as well. There has to be a certain business culture that motivates employees to follow and work with the members of the community. Furthermore, to succeed in online collaboration, many offline events such as the Threadless family reunion or the Local Motors open house play a critical role.

In addition, my research has combined the firm and the contestant perspective, something that previous research has not often done (Jeppesen & Frederiksen, 2006). As such, my findings are more robust as they are based on the perspective of both parties involved. I considered not only the way the firm perceived and formulated their practices, but also how the practices were actually received by the community.

Community-based innovation contests have only recently attracted research attention (Bullinger et al., 2010). As a result, our understanding of this approach in general, as well as why it makes sense to combine communities and contests, is still relatively limited. My research has provided a first answer as to why firms would

consider combining the two approaches on a strategic level. It has shown that the two are complementary when it comes to learning and the development of skills for the contestants. This understanding is important as it highlights that community-based contests can have advantages over stand-alone innovation contests. Furthermore, the outlined learning processes have provided initial insights in the workings of this approach. Further areas that could be explored are the social processes beyond learning that occur in community-based contests. Furthermore, there is only limited research on learning in stand-alone innovation contests. This could provide a focus for future research.

My research has explored how firms can manage the relationship between the firm and the community. I have highlighted the centrality of developing the social identity of the community members and demonstrated how the firm can use firm-level practices to make members feel part of the firm. Previous research looking at firm-hosted communities for innovation has only identified more abstract concepts such as the creation of innovation partnerships as central for this relationship (Nambisan & Baron, 2010). Previous research has missed the opportunity to substantiate these concepts by showing how firms can actually create such partnerships. As such, my research is the first to show the firm-level practices used to manage the relationship between the firm and community. Further research should explore whether positive joint-firm identity can also be created with similar practices in pure firm-hosted communities without contests.

The communities I have investigated are different to most of the previous communities researched. Most research on innovation communities has focused on open source or software communities (Dahlander & Magnusson, 2005; Jeppesen & Frederiksen, 2006). My research has described communities created for automotive and t-shirt design. It is important to reiterate, then, that innovation communities and contests are an approach that can be applied to multiple industries beyond software.

Furthermore, the communities were solely dedicated to innovation. While previous research has mainly looked at firm-hosted user communities where innovation is a by-product (Dahlander & Frederiksen, 2012; Jeppesen & Frederiksen, 2006), the two cases I examined were firm-hosted communities that focused on creating products and not product support. This is an important shift as it shows that firms can sustain this type of community so that it provides constant inputs into the innovation process. It also shows that the wider public has an interest in innovating for firms simply because they enjoy it rather than because they have a particular need as lead users. Further research should understand these non-lead users and how they differ from lead users in their innovation activities beyond their motivations.

My findings on community-based innovation contests differ significantly from previous research on stand-alone innovation contests. My research has demonstrated that contestants have motivations that go beyond their desire for extrinsic rewards (Terwiesch & Xu, 2008). While they might be attracted by prizes, feeling part of the firm and creating contest entries in a learning environment that gives them the freedom to follow their own ideas are equally important factors. This finding is crucial as it means the focus of future

research on innovation contests will have to widen. Even though my research shows that contestants are rational, it suggests that they might seek other things than previously believed. This perspective also offers new ways for research on 'old problems' with regards to innovation contests. Previous research has studied how to best restrict contests to get the best combination of effort and variety in terms of submissions (Boudreau et al., 2011; Terwiesch & Xu, 2008). New research could further explore how best to stimulate intrinsic motivation in stand-alone innovation contests in such a way as to maintain effort while ensuring variety.

At the same time, my research has traced important connections between intrinsic and extrinsic rewards. First, extrinsic rewards are relevant for attracting contestants. The attractive prizes that firms offer tempt contestants to participate. These contestants subsequently become intrinsically motivated on the basis of their initial contest experiences. Furthermore, feeling competent is an important requirement for intrinsic motivation. The extrinsic rewards can enhance an individual's feelings of competence and thereby lead to intrinsic motivation

My research has provided a valuable perspective by using self-determination theory to describe what a stimulating contest environment looks like in community-based innovation contests. Previous research has largely ignored central concepts of these contest such as the autonomy of contestants. Self-determination theory sees the feeling of autonomy as the most important condition for the development of intrinsic motivation (Ryan & Deci, 2000b). I highlight the importance innovation contest elements such as these. These findings should motivate further research to focus on what elements are

needed for a successful contest environment in community-based and stand-alone contests, rather than concentrating on prizes alone.

A further central difference between my research and much of the early research on innovation contests is the type of contest focused on. Early research on innovation contests focused on contests among firms or big public contests (Che & Gale, 2003; Davis & Davis, 2004; Taylor, 1995). My findings come from innovation contests in which individual hobbyists are the main participants. While this might explain some of the differences in the findings regarding motivation, it would be interesting to what extent my findings hold in these other more traditional settings. Furthermore, my research shows that it matters who competes for what and in what context. This should caution other researchers to assume earlier findings on innovation contests translate directly onto this new type of contest.

Overall, my research has provided a more contingent view on innovation contests. Previously, researchers looked at them in an overly simplistic way, only looking at the setting of a prize, the creation of a brief with certain requirements and the subsequent wait for the entries. I have shown that depending on the contest environment, the relation to the firm and how the contest has been defined intrinsic motivations can play an important role and significantly affect the behaviour and performance of contestants

Overall, my research suggests that communities and contests are not mutually exclusive and can in fact create significant value if combined in community-based contests.

Methodologically my research is different to most research that has been done on innovation contests and firm-hosted communities. In line with the nascent stage of research in this area I have adopted an inductive case study methodology, rather than a deductive, hypothesis testing approach (Edmondson & McManus, 2007; Yin, 2003). The three empirical chapters represent the three main concepts that emerged during the field work on the ground. Learning, identity and recreational labour were central topics that emerged from the observations and interviews with both firm and community members. Previous research has mainly adopted a deductive approach, defining concepts that are relevant for innovation contests and firm-hosted communities a priori. Consequently, it did not identify the central motivators for contestants that my research has identified.

Furthermore, my research has taken an interpretive approach. The chapters on identity and recreational labour in particular have focused on the meanings, feelings and perceptions of contestants and other community members. It thereby provides a perspective of how members of firm-hosted communities and contestants feel about their role and the tasks they do. Further research could extend this interpretive perspective by inquiring more deeply into how contestants feel about fellow contestants and the relationship between collaboration and competition.

7.5 Theoretical contributions beyond innovation management

My research has looked at the engagement of contestants and communities for the purposes of innovation through three different lenses: Experiential learning, social identity theory and self-determination theory. Besides its contribution to innovation

management, my research provides insights that are relevant for advancing the knowledge in each of these areas.

First, experiential learning theory has long focused on learning environments that are conducive to learning. Online environments have been one focus area in recent years (Alavi et al., 2002; Freitas & Neumann, 2009). For instance, simple online environments which facilitate communication about the experience have been found more successful for experiential learning than complex communication platforms (Alavi et al., 2002). My research shows that also more complex learning environments can be valuable if the individual elements of contests and communities support and reinforce each other. Combining a contest for gaining experience and a community for learning from experience can create a successful learning environment.

Secondly, social identity theory has largely focused on the nature and effects of social identity on behaviour. Some social identity and leadership research has considered how leaders can use social identity to make employees follow them (Ellemers et al., 2004). Nevertheless, relatively little research has focused on how firms can create social identity. What is more, no research has examined how firms can make the ever increasing number of external partners that firms work with feel part of the firm and thereby improve the partnership. My research has identified specific firm-level practices that can create social identity across firm boundaries and result in valuable contributions to the firm.

Thirdly, self-determination theory has long focused on the relation between intrinsic and extrinsic rewards (Deci et al., 1999). The main claim so far is that extrinsic rewards undermine intrinsic motivation (crowding out effect). My findings point to a new direction. Extrinsic rewards can lead individuals to experiences that elicit intrinsic

motivation. This happens when individuals who are attracted by extrinsic rewards realise that even though the rewards are hard to attain, participating in itself is rewarding. Furthermore, my findings show that the feeling of autonomy, which is a critical condition for intrinsic motivation under self-determination theory, needs to be defined more broadly. To feel autonomous, individuals need to feel that the work they do is personal and that they have ownership over the final result.

7.6 Research validity and limitations

This study design has a number of limitations that need to be acknowledged. These are mainly related to the selection of the research settings and the number of cases. My research relies on only two case studies, but investigates these in-depth. This seemed appropriate as there was limited previous understanding about how firms could encourage engagement. Therefore, I intentionally chose depth over more breadth.

I have used a number of techniques to ensure the internal validity of my research and make sure that any potential biases of mine were removed.(Maylor & Blackmon, 2005; Miles & Huberman, 1984).

First, the relationships that I have presented between the decisions and actions of the firms and the effect on the engagement of community members or contestants are all the result of the analysis of multiple sources of triangulated data. This triangulation has been done both with regards to data types, informants and to some extent methods used. For all of the three chapters I have used observational data of online and offline behaviour as well as interviews. These data sources were supported by other ones where appropriate,

including firm documents. I interviewed and observed those inside and outside of the firm, spending time at the headquarters of the companies and on the online communities. Having this dual perspective allowed me to calibrate the causal relationships between the firms and their communities. I was able to see how firm practices percolated down into the community and vice versa. Further, triangulation for the chapter on learning was achieved through using quantitative community participation and contest data for the growth curve analysis.

Secondly, in the analysis I actively searched for alternative explanations and ensured that they were not valid. For instance, the increased learning of contestants that continued to participate regularly in the community might have been because of changes in voting behaviour: contestants that are active in the community might get favourable treatment, or, similarly, contestants active in the community might simply exert more effort and thereby learn more. Nevertheless, when analysing the interview data from contestants, it was clear that this community learning effect existed.

In the chapter on recreational labour, I showed the intrinsic motivation of contestants that led to them creating contest entries. An alternative explanation for the contestants' behaviour could have been some other extrinsic rewards that I did not analyse. To validate the fact that contestants are actually intrinsically motivated, I carried out in depth examinations of some of the contestants based on the interviews. This helped me to ensure that other motivators, such as career aspirations, were not the actual drivers. Instead the joy of creating entries came first and foremost.

Thirdly, the results presented in the three empirical chapters were validated by the participants in the study. After the analysis for the chapters was completed, I presented

and discussed these findings with employees of the firm as well as community members. In each case, these people confirmed the analysis and conclusions that I derived.

The data and analytical methods that I used effectively identified the firm practices and activities and their relation to contestant engagement. However, my approach has some limitations with regards to understanding the relative effect of individual practices and processes. For instance, although I have shown the different ways in which the firms could encourage experiential learning, I cannot say which of these processes are more critical than others. Similarly, I have identified the practices that lead to joint-firm community identity. Yet due to the fact that I do not have sufficient variance with two cases on these practices, it is not possible to say whether for instance with only six of the eight practices the firm would still create the social identity. As both Threadless and Local Motors are successful, there is only limited variance in terms of engagement performance. To overcome this challenge I have, particularly in the chapters on identity and recreational labour, highlighted situations from the case studies where identity breaks down and contestants cease to be intrinsically motivated.

Similarly, my thesis has focused on how firms engage communities to participate in contests on an ongoing basis. As such, my research does not give any information on the size of the effects that I am describing, information that seems highly relevant for managerial action in particular. While I have shown how much contestants can learn from community participation, I have not quantified the size of this learning benefit to the firm, both in terms of extra effort and quality. Similarly, my thesis does not show how much more effort community members put into their work or how often community members

contribute once they feel part of the firm. Also, I have not explored the differences in effort and quality between intrinsically and not-intrinsically motivated contestants.

With regards to external validity my study has also limitations. I have researched two firms that are special as they create all their innovation through community-based contests. That these two firms are active in two very different industries: (clothing and automotive), gives the research external validity with regards to its applicability to other industries. The genesis of the two firms is also very different. Threadless started from a community and Local Motors started from nothing, lacking an existing community. This suggests that the practices apply to community-based contests irrespective of how the communities were created. At the same time, while it seems likely that the findings I have made with regards to community-based contests also apply to a certain extent to individual contests and firm-hosted communities, this implication cannot be concluded with certainty from the data that I have collected. Similarly, my research happened in small-to-medium sized firms that solely employed community-based contests for their innovation. Even though the community-based contests that larger firms conduct as part of a portfolio of innovation approaches seem similar, this contention cannot be accurately ascertained without further research.

7.7 Implications for empirical methodology

This study adopted an inductive case study methodology because of the nascent state of previous research on community-based innovation contests (Edmondson &

McManus, 2007). Methodologically, the study has a number of advantages over previous research. First, my study has shown that to understand both innovation contests as well as firm-hosted communities investigating both the firm and the contestants involved is a valuable tactic. Previous research has mainly focused on the communities or the contestants (Boudreau et al., 2012; Dahlander & Frederiksen, 2012; Terwiesch & Xu, 2008). Little research has focused on the role of the firm. My study collected data about the firm as well as the contributors through interviews, observations and online research. Many practices that I have identified could only be found because I had the perspective of both parties involved.

Secondly, in contrast to the research on innovation communities, most research on innovation contests has taken a quantitative approach (Boudreau et al., 2012; Boudreau & Lakhani, 2011). This seems appropriate if you take the perspective that, when looking at innovation contests that contestants are rational and purely compete for gaining monetary rewards. My research has shown that this assumption is often not true. Contestants' motivations and experiences are more multifaceted. This study can be seen as a first step to understand contestants better. More qualitative research that takes an interpretive approach seems fruitful and will help us to gain a more robust understanding of the expectations, emotions and experiences of contestants. As my study has shown, intrinsic motivation plays an important part in innovation contests. Only qualitative research seems well-suited to further explore this topic.

Thirdly, investigating online collaboration, it is very convenient to rely solely on online data collection, such as collecting conversations that go on in the community or to send out online surveys to participants. My research has shown that to understand online

collaboration fully, off-line data can be highly valuable. As my research has illustrated, online collaboration has important off-line components. These off-line components can often be critical for making the online collaboration work. Observing meetings of community members and employees at Local Motors or the annual family reunion at the Threadless headquarters in person provided important data for understanding the feeling and attitudes of both sides towards each other and why their collaboration works. Furthermore, many activities that the firms do for their online collaboration partners only become apparent when observing the off-line activities in their offices. For instance, I could only notice the amount of time that employees spent in the communities by being on the ground within the two firms. All this shows that in researching online models of collaboration considering what is not visible online is vital.

7.8 Implications for managers

My thesis has implications for firms and their managers on a variety of different levels. First, community-based innovation contests provide advantages for firms that are not available with stand-alone innovation contests. They can help contestants learn and improve. As a result, even contestants with initially lower skill levels can become valuable contributors to the firms. As previous research has shown, firms are in constant need of finding new suitable contributors of ideas (Bayus, 2013). The community-based innovation contests can help firms overcome the challenge of finding an adequate number of high quality contributors to ensure a consistent inflow of new ideas. Furthermore, the learning processes and presence of the community help retain contributors over time.

Many come back as they have profited from feedback and have built lasting relations with other community members. The learning benefit through participation creates additional incentives for contestants and relieves firms from having to restrict entry or set higher prizes to maintain effort (Fullerton & McAfee, 1999). At the same time, the contest element creates some order to the messiness of communities and provides firms with a structured selection process for the external contributions.

Nevertheless, managers aiming to adopt this approach need to consider its limitations, costs and requirements. For this approach to work, firms need to innovate in the same domain frequently. To be able to build and sustain a community there needs to be repeated contests to give some purpose to the community. If these contests are in unrelated domains, there will not be enough joint interests and opportunities to learn from each other and so form and sustain a community. Similarly, research on open source software has shown that not every domain has a sufficient number of qualified and interested individuals (Dahlander & Magnusson, 2008). This observation means that firms cannot use community-based innovation contests in every domain of knowledge. Managers need to consider carefully whether their domain will attract sufficient interest and expertise. In case of Threadless and Local Motors similar communities focusing on shirt or automotive design previously existed on the internet. This demonstrated to the founders that considerable interest in these domains already existed. Such pre-existent communities can provide insights into whether a community-based contest approach is possible.

Following a community-based contest approach leads to higher costs than just using innovation contests. The firm-hosted community requires support from the firm.

This typically involves a community manager or management team. The participation of other employees in the community typically means that they have less time to spend on their main jobs. Furthermore, developing a suitable online platform that is equipped with the needed online tools for creating entries and exchanging opinions is a significant investment. Lastly, sponsoring community projects can lead to on-going costs.

Most importantly, the behaviour of the firm is an essential element of making this approach to innovation work. It poses significant new requirements on the firm. In order to create the close relationship with the community, firms need to be open and responsive to the community. Most managers and organisations are not used to, and indeed often fear, sharing information with outside partners over which they have at best limited control. My research has shown that to make contestants feel part of the firm sharing internal events and information, including about strategic decisions, is essential in creating and maintaining a close relationship with the community. In sharing this information, it is important that community members approve of the direction the company decides to take. Genuine concerns for the community and firm values that are aligned with what the community and the members believe in are important. Furthermore, firms need to go beyond sharing of information to integrate the community into their decision process to create buy-in. This can mean changing decisions based on community input, even if it has a negative impact on the firm's performance. In addition, the firm needs to be willing to evaluate, support and invest into ideas that are brought up by the community. Often these ideas will translate into a healthier community, but might not directly impact positively on the firm's bottom line.

Particularly within contests, contestants desire autonomy. If firms grant this autonomy, it can lead to intrinsically motivated contestants that exert more effort for the contest entries they create. At the same time, this means that firms must give up much of their control over what contestants create. Firms retain some control through the selection of contest entries, but they are limited in what they put out as a contest. Not all problems can be posed with a broad contest brief. Furthermore, working with external partners or internal departments that have very narrow requirements might not work as it can kill contestants' motivation. As previous research has alluded to, firms need to put great effort into developing suitable contest briefs (Sieg et al., 2010; von Krogh et al., 2012). It is essential to create designated roles that focus on setting the briefs. Expertise in this area will give contestants sufficient freedom while at the same time ensuring that entries are still valuable to the firm.

Overall, managers thinking about adopting community-based contests need to consider carefully whether they are willing give up control to fulfil these requirements and whether this would be possible within the culture of their organisation.

With regards to innovation contests, my research has some further implications. Firms are often concerned with how they should structure the prize for the contest and what the optimal size is. My research highlights that, partly because of the uncertain nature of such prizes, other factors like the contest environment are at least of equal importance. In online innovation contests, most contestants are hobbyists that participate in their spare time. As such the contests compete with other recreational activities for the contestants' time. Investing in an environment that makes the contest enjoyable and

provides contestants with opportunities to learn and develop is extremely important, if firms want contestants to spend more time on their platforms and to come back and participate on a regular basis. Firms need to understand that for contestants participation is not work. Consequently, tasks need to be set differently and in a different environment than for an employee. Contestants value freedom in what they are doing as well as having a platform that is easy to handle and which provides them with simple tools to perform their hobbies.

7.9 Implications for policy

Whilst my research has mainly focused on the firm and their role for community-based contests, my research has implications for policy on two levels.

First, as highlighted at the beginning of this thesis, innovation contests are not only relevant in the context of business, but are often used for public policy initiatives, such as development of environmental technologies or the development of vaccines for developing countries (Davis & Davis, 2004; Kremer, 2000). For firms, my research has shown that they can greatly benefit by not only running pure contests, but adding a community dimension. This dimension improved learning and the quality of the contests. Consequently, it seems valuable to investigate to what extent community elements could also enhance and improve the contests that are run to stimulate technological progress. There are certainly challenges for creating such communities, particularly if firms with individual profit motives are involved, but given appropriate community benefits these firms might be willing to participate in a community-based innovation contest. Thus,

public sponsors of innovation contests should consider to what extent the community-based contest approach might be adopted for their contests.

Secondly, firms are increasingly using communities and individuals for their activities over the internet. This can be for innovation as shown in my thesis, but also for other tasks that are often collected under the label of crowdsourcing (Afuah & Tucci, 2012; Howe, 2008). As firms work with these people, it is often the case that a firm does not reward all of them, but only a few that make the most valuable contribution. As a result, there has been an increased discussion on whether these firms are exploiting these individuals. Some people have argued that regulation of crowdsourcing is needed. My thesis provides a more nuanced view on this demand and could be seen as evidence that regulation is not actually needed.

My research has shown that even if participants are not compensated with money, this does not necessarily mean that they are not getting rewards out of their participation. The learning experiences that community-based contests create are highly valuable for many contestants. Furthermore, I have shown that a lot of contestants are intrinsically motivated—they enjoy what they do as a hobby. Given these circumstances, the contestants do not feel exploited even if they do not win.

Furthermore, I believe a distinction needs to be made between different approaches for involving the public. Particularly in community-based contests, contestants have significant power over firms. Contestants are closely connected in the community, which means the firm deals with a more equal partner. Managers are aware that if they disappoint the community they face serious threats for their business. Consequently, in community-based contests, the community ensures an environment that

is seen as just by the majority of contestants. Certainly, without a community individuals would have less power and control over the firm. Yet, in each of these online approaches for involving the public, individuals can walk away from the firms whenever they want and can thereby limit its control. In conclusion, regulating this form of collaboration is not needed.

7.10 Avenues for future research

The focus of my research has been very much on the contestants, the core innovators for firms running community-based innovation contests. Nevertheless an interesting aspect of the community-based innovation contests is that in the communities reach beyond just those who are competing. Whereas in innovation contests only the innovators participate, in community-based innovation contests there are customers, enthusiasts and other interested individuals who do not submit entries to the firms contests, but nevertheless participate on an on-going basis to the community. To better understand the motivation of these members, as well as their role and contribution to the contest entries, would be an interesting focus for further research.

Furthermore, my research has focused on members that at some point were active in the contests and/or community. Nevertheless, there is a group of members who drop out of the contests relatively quickly and do not come back or, perhaps, never even participate in a contest in the first place. Understanding their motivations and why they choose not to participate could provide interesting insights into how firms can be successful in attracting and retaining even more contestants.

Overall, community-based contests have still received relatively little research. There are a number of further topics that are interesting with regards to community-based contests. In community-based contests, contestants compete with each other in the contests while helping each other in the community. How these two competing models work together should be investigated in further research. Is it norms of reciprocity or that the community bonds are stronger than the competition? Questions like these should be investigated.

Furthermore, I explored community-based contests in domains that classically attract many enthusiasts and hobbyists: design and automotive. Exploring the limits of this approach by examining community-based contests in other industries would be interesting. To understand how these communities work, I have focused on successful cases. Exploring cases where community-based contests did not work will strengthen our understanding of this area. Failure in this regard could be down to a number of reasons, which might include the community not getting sufficient interest, or there being a lack of collaboration between the contestants.

In chapter four I have shown how contests and community complement each other in creating experiential learning. The focus was on how contestants learn along the four stages of the Kolb (1984) learning cycle. As I highlighted in the discussion of chapter four the community as such can be seen as a community of practice: The contestants have a joint interest of designing T-Shirts or cars and use the community to exchange knowledge and experiences as well as to learn from each other. Furthermore, they share a practice; all of contestants create contest entries for the firms' innovation contests.

Lave and Wenger (1991) introduce the concept situational learning that takes place in communities of practice. The experiental learning that I describe in chapter 4 is similar to situational learning as it also is less about structured taught learning, but about learning in the same environment where acquired skills are subsequently applied. Situational learning happens by observing and imitating what more experienced and skilled community members do. This can also be seen at Threadless and Local Motors as described in chapter 4. Contestants have a chance to see the entries of other including more successful contestants and thereby learn from them. Furthermore, they have the chance to watch these masters by collaborating with them or watching the video tutorials that some of them create. As also observed at Threadless and Local Motors more experienced members or masters take on mentoring roles for newer contestants and help them to develop their skills. Looking from Lave and Wenger's (1991) community of practice perspective at Threadless and Local Motors brings out another dimension of learning that is not as explicit in Kolb's experiental learning theory: The apprenticeship model that they describe emphasizes the change of roles of community members through learning over time (Lave & Wenger, 1991). Whilst members start out at as apprentices at the periphery of the community, over time through observation, imitation and experimentation they become more core to the community and develop into more skilled members or masters (Lave & Wenger, 1991). These masters then take on a teaching role for new peripheral members. These changes were also visible in the two cases that I investigated. Threadless artists that had been printed multiple times emphasized how they were now helping new contestants much in the same way that more experienced members had helped them when they first started. Kolb's (1984) experiental learning cycle has a more short term perspective of how individuals make sense of their experiences and sees learning as less of a social process than Lave and Wenger (1991). Consequently, in future

research the learning in community-based innovation contests could be investigated from a community of practice perspective.

As a social theory of learning communities of practice also have a social understanding of identity. The identity is defined by the communities of practice that we participate in (Wenger, 1998). Different elements of the communities of practices impact the identity. Firstly, being part of a community of practice means developing relations to other community members (Wenger, 1998). These relations in part define the members' identity. Secondly, the practice that the community of practice focuses on influences the identity (Wenger, 1998). The occupation or activity the community focuses on is for members integral an element of their identity. Lastly, members learn in community of practice. The experiences and learnings that members make are a defining element of the members' identities (Wenger, 1998).

Looking from this perspective on joint-firm community identity it becomes clear why community members start to feel part of the firm. Both the firm and the community focus on the same practice. The community is focused on creating T-Shirt or car designs as is the firm from a commercial point of view. Many employees inside the firm are t-shirt or car designers as well. This shared practice is a first element that contributes to a joint firm-community identity. Secondly, as I have shown in chapter five the relations are not only confined to the boundaries of the online community, but span the boundaries. Community members are friends with employees, employees actively participate in the community. Lastly, communities learn about design from other community members, but also from the firms. Furthermore, community practices like the Open House practice mean that community members also learn from and about the firms and their members.

As a whole from community of practice definition the firm and community could also be understood as one community of practice that spans across the community and firm boundaries and such means that community members feel part of both. This could be the focus of future research

The findings and observations of my research in some areas challenge and contradict previous findings and thereby provide opportunities for further research.

Previous research has often emphasised that firms and communities have very different goals that are difficult to bring together (Dahlander & Magnusson, 2005). My research shows that in community-based contests interests of the firm and the community are largely aligned. Contestants participate because they want to innovate with the firms. They are excited about the fact that their ideas will be sold and they understand that firms follow their commercial interests. This stands in contrast in particular to the research on firm-hosted software communities where community members very much dislike the commercial objectives that firms follow with the community outputs (Dahlander & Magnusson, 2005; West & O'Mahony, 2008). Contrasting the two models as well as the members that participate could provide interesting insights about how to align firms' and communities' interests.

In another area, Bayus (2013) points out that contributors' ideas become less valuable after they have been successful with the firm. As they try to replicate past success, contributors propose less divergent ideas, and mainly put forward suggestions that are similar to their successful ideas. In contrast, at Threadless I have found multiple contributors that have successfully won ten or more innovation contests. Furthermore, the

learning benefits of participation that I described in the first empirical chapter suggest that contributors become more rather than less valuable to the firm over time. It seems like there are different effects at play: a novelty effect that would explain what Bayus has found and a learning and experience effect which I observed at Threadless. Better understanding these two effects and when either one is dominant should be explored in further research.

Related to these points is the question of closeness versus distance between contributors and the firm. A lot of proponents of open innovation and innovation contests point out that one of its advantages is its distance in search (Verona et al., 2006). Firms get ideas from individuals with different domains of knowledge than their own. In addition, contributors have a different cognitive frame, as they do not possess knowledge about what his happening inside the firm (Kaplan & Tripsas, 2008; Verona et al., 2006). These characteristics enable contributors to come up with ideas that are very different to what the firm would come up with. They are thus often more valuable. In the community-based contests that I have investigated, one core element is the closeness between the firm and the firm-hosted community. Furthermore, firms share a lot of what is happening inside their organisation with the community. Contrasting this approach with a more distant approach could provide insights into to what extent and how the firm's relation with external innovators impacts on the ideas and benefits they receive.

Furthermore, my research has pointed out a tension that previous research has neglected. The closeness to the firm and openness from the firm to the community is something that was very much valued and desired by the community. It played an integral element in creating the firm-community identity and thus drove external contributions to

the firm. The firms that I researched felt they were getting very valuable ideas from contestants. Consequently, further research could explore how firms can successfully manage to create a close relationship that induces contestants to contribute while maintaining the distance needed to ensure that the ideas are “different” and valuable to the firm.

The community-based contests have significance beyond the sphere of innovation that needs to be investigated in further research. In combining communities with contests this approach also combines an environment that is very conducive to learning with a measurement of learning success and skill. As I have shown contestants significantly profit from experiential learning mainly driven through the opportunities provided by the community. The number of contests won provide an indication of the contestant’s skills as do their contributions, which are typically presented in the community. As a result, this community approach has become a form of qualification. Both at Threadless and Local Motors contestants have gained formal employment based on the skills they have learnt and the contests they have won. This employment was with firms other than the sponsoring firms. Contestants reported that other firms recognised their quality based on their achievements with the contests of the two firms. Contestants included these achievements as a core element on their CVs. All this shows that community-based contests have important implications for education and professional boundaries. While traditionally people who became designers went to design schools, some individuals without this background become part of this profession based on their learning and achievement in community-based contests. Understanding the differences these learning contexts provide to more traditional educational paths, the implications for professional

boundaries and the limitations of this community-based contest education model should be the focus of further research.

Lastly, during the interviews I realised that, of the members I interviewed, an unusually high number had problems with communicating. This could be a simple issue of having language problems, introverted personalities or even disabilities. Nevertheless, the community-based contest taking place online brought them altogether and enabled them to exchange and collaborate irrespective of their situations. As members do not communicate face-to-face, they are mainly judged based on their contributions rather than their personal attributes. As such, this form of online platform enables people that in an offline life might have been unable or unwilling to participate, or even discriminated against, to participate fully and enjoy the experience. The nature of such platforms as integrative mechanisms could be another avenue for valuable future research.

7.11 Conclusion

In the last decade firms and researchers have turned their attention to how firms can involve the wider public in their innovation efforts over the internet. Research attention has focused largely on the participants, whether these were community members in online communities or contestants in innovation contests. While many firms have struggled with such approaches, the role of the firm in making such collaborations a success has not yet been explored. My thesis has made a significant contribution towards understanding how firms can make these collaborations work. Based on in depth data gathered from two firms, I have explored three different, but complementary, areas in

which firms can engage online communities to participate in their innovation contests on an on-going basis.

First, the approach that firms select impacts the engagement. I have explored community-based innovation contests. The combination of firm-hosted communities with innovation contests creates an experiential learning environment that can be superior to stand alone contests. These learning opportunities motivate contestants and ensure that they contribute on a regular basis.

Secondly, I have shown that the relationship between the community and the firm affects engagement. Using appropriate practices firms can make community members that have no formal relation or role with the firm feel part of the organisation. Porous boundary practices like openly sharing information or community support practices like top-management involvement in the community create positive joint firm-community identity.

Thirdly, the way that firms structure their innovation contests and set the contest brief is important for motivation. The firm needs to attract contestants with an intrinsic disposition for the activities the contests focus on. Making contestants feel competent and providing them with sufficient freedom in the contest brief changes their perception of the contest. They feel intrinsically motivated and will perceive the participation as recreation rather than work.

My research provides an important contribution in showing the role of the firm in making these collaborations work. However, more research in different settings is needed to gain a full understanding on the role of the firm. My research has shown that, in doing

so, it is important to consider the perspectives of both firms and contributors in online and offline settings to arrive at an appropriate understanding.

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