

# Attraction

## A New Driver of Learning and Innovation

Claes Bohman

Akademisk avhandling

Som för avläggande av ekonomie doktorsexamen  
vid Handelshögskolan i Stockholm  
framläggs för offentlig granskning  
fredagen den 17 december 2010, 10.15  
i sal Torsten, Handelshögskolan, Sveavägen 65, Stockholm





# Attraction



# Attraction

A NEW DRIVER OF LEARNING AND INNOVATION

Claes Bohman





Dissertation for the Degree of Doctor of Philosophy, Ph.D.  
Stockholm School of Economics 2010

Keywords:

Innovation

Learning

Strategy creation

Competitive advantage

Attraction

Attraction: A new driver of learning and innovation

© SSE and the author, 2010

ISBN 978-91-7258-838-7

Printed in Sweden by:

Intellecta Infolog, Göteborg 2010

Distributed by:

The Research Secretariat

Stockholm School of Economics

Box 6501, SE-113 83 Stockholm, Sweden

[www.hhs.se](http://www.hhs.se)

# Preface

The research that is reported in this doctoral dissertation was initiated at the Institute of International Business (IIB) and concluded at the Department of Marketing and Strategy at the Stockholm School of Economics. The author has been free to conduct and present the research in his own ways as an expression of his own ideas.

The research was generously funded by the Söderberg Foundation. This support is gratefully acknowledged. The preparation of the thesis was made possible due to the kind cooperation of numerous managers of Autoliv, DeLaval, Ericsson, and a number of other companies who shared their experiences and provided documentation. The Stockholm School of Economics would like to thank all contributors for their generosity and openness.

*Richard Wahlund*  
Professor and Head of Department  
of Marketing and Strategy  
Stockholm School of Economics

*Filip Wijkström*  
Associate Professor  
Director of Research  
Stockholm School of Economics





# Acknowledgements

While writing this dissertation I have received valuable support and contributions from a number of people for whose help I am grateful. First and foremost, I've been fortunate to have the support of a knowledgeable and dedicated dissertation committee. Associate Professor Patrick Regnér who served as the committee chair exhibited a great deal of commitment to the project, reading numerous drafts, providing pertinent comments, and generously sharing his time for discussions, all of which played an instrumental role in helping me finalize the thesis. Professor Udo Zander's enthusiasm and creative ideas were an important source of inspiration and support. Professor Jerker Denrell helped frame the fundamental problem that is addressed in the study and provided numerous insightful comments, which much improved the quality of the dissertation.

Second, I would like to thank the managers of the case companies whom I interviewed during the course of the study for generously sharing their time, thereby making the study possible.

Third, I would like to thank my colleagues at the Stockholm School of Economics for reading earlier drafts of the thesis in conjunction with seminars and providing constructive and helpful comments. Special thanks go to my former fellow doctoral students Ciara Sutton, Jesper Edman, Göran Lindqvist, and Maetinee Hemrit for help, moral support, and collaboration.

Special acknowledgement goes to Professor Woody Powell for extending an invitation for a year-long stay at the Scandinavian Consortium for Organizational Research (SCANCOR) at Stanford University, a sojourn that much enriched my understanding of the issues addressed in the dissertation. The quality of the thesis was also improved by the pertinent and constructive comments that were

provided by Professor Markus Becker at the mock defense that took place in January 2010.

Finally, this dissertation would not have been possible without the support of a number of organizations and institutions. First and foremost, the Söderberg Foundation provided the long-term financial support that allowed me to pursue this line of research. In addition, the Sweden America Foundation, Tom Hedelius Foundation, and Carl Silfvén Foundation all contributed generously to fund my stay at Stanford University.

Stockholm, September 2010

# Contents

PREFACE.....	V
ACKNOWLEDGEMENTS .....	VII
CONTENTS .....	IX
FIGURES, TABLES, AND APPENDICES .....	XI
INTRODUCTION.....	1
1.1 INNOVATION AND LOCAL SEARCH IN ESTABLISHED FIRMS.....	2
1.2 EXPLORATION BEYOND LOCAL SEARCH .....	4
1.3 AN ATTRACTION-BASED APPROACH: FIRMS AS MAGNETS.....	6
1.4 PURPOSE, EMPIRICAL FOCUS, AND EXPECTED CONTRIBUTION .....	8
1.5 DEFINITIONS.....	11
1.6 OUTLINE OF THE THESIS.....	12
THEORY .....	15
2.1 POINT OF DEPARTURE: A DYNAMIC PERSPECTIVE ON STRATEGIC MANAGEMENT AND COMPETITIVE ADVANTAGE.....	16
2.2 CHALLENGES ASSOCIATED WITH INNOVATION AND STRATEGIC ADAPTATION .....	17
2.3 EXPLORATION MECHANISMS .....	22
2.4 A RESEARCH GAP: ATTRACTION AND THE ROLE OF EXTERNAL INITIATIVES.....	34
2.5 CONCLUSIONS AND OUTLOOK FOR THE EMPIRICAL STUDY .....	36
PILOT STUDY .....	39
3.1 PILOT STUDY PART 1: EXAMPLES OF ATTRACTION PROCESSES.....	41
3.2 PILOT STUDY PART 2: SYSTEMATIC ATTRACTORS .....	68
3.3 CONCLUSIONS AND IMPLICATIONS FOR FURTHER EMPIRICAL STUDY.....	94
3.4 PURPOSE AND RESEARCH QUESTIONS.....	97
RESEARCH DESIGN AND METHODOLOGY.....	103
4.1 RESEARCH DESIGN .....	105
4.2 DATA COLLECTION.....	121
4.3 DATA ANALYSIS .....	125
4.4 QUALITY APPRAISAL AND VALIDITY.....	128
CASE DESCRIPTIONS AND WITHIN-CASE ANALYSES .....	133
5.1 DELAVAL AND THE MILKING SYSTEM INDUSTRY .....	134

5.2 AUTOLIV AND THE AUTOMOTIVE SAFETY INDUSTRY .....	168
5.3 ERICSSON MULTIMEDIA AND THE “MULTIMEDIA INDUSTRY” .....	198
CROSS-CASE ANALYSIS.....	227
6.1 CROSS-CASE ANALYSIS.....	227
6.2 HOW ATTRACTION WORKS AND THE FACTORS THAT MAKE FIRMS ATTRACTIVE TO EXTERNAL INNOVATORS - RESEARCH QUESTION 1 .....	236
6.3 THE CONTEXTS AND CONDITIONS UNDER WHICH ATTRACTION IS IMPORTANT FOR FIRMS – RESEARCH QUESTION 2 .....	250
6.4 SUMMARY OF CHAPTER 6 .....	261
DISCUSSION AND CONCLUSIONS .....	263
7.1 HOW ATTRACTION INFLUENCES LEARNING, INNOVATION, AND STRATEGY CREATION - RESEARCH QUESTION 3.....	264
7.2 HOW ATTRACTION DIFFERS FROM SEARCH – RESEARCH QUESTION 4 .	280
7.3 BENEFITS ENJOYED BY ATTRACTIVE FIRMS.....	289
7.4 ATTRACTION POWER: CONCLUSIONS AND PROPOSITIONS .....	298
DISCUSSION AND IMPLICATIONS .....	303
8.1 IMPLICATIONS FOR THE ORGANIZATIONAL SEARCH LITERATURE .....	304
8.2 IMPLICATIONS FOR THE DYNAMIC CAPABILITIES LITERATURE .....	315
8.3 IMPLICATIONS FOR THE LITERATURE ON STRATEGY CREATION IN LARGE FIRMS .....	323
8.4 MANAGERIAL IMPLICATIONS .....	330
8.5 LIMITATIONS .....	336
8.6 CONCLUDING REMARKS.....	337
APPENDIX A: SOURCES FOR THE PILOT STUDY .....	339
APPENDIX B: SOURCES FOR THE MAIN STUDY.....	345
APPENDIX C: LISTS OF INTERVIEW QUESTIONS .....	355
BIBLIOGRAPHY .....	359
SSE PUBLICATIONS .....	379

# Figures, Tables, and Appendices

Figure 1.1 Structure of Chapter 1 .....	2
Figure 1.2 Outline of the thesis .....	13
Figure 2.1 Structure of Chapter 2 .....	16
Figure 2.2 Research gap and empirical focus .....	36
Figure 3.1 Structure of the pilot study .....	40
Figure 3.2 Preliminary conceptualization of attraction .....	96
Figure 4.1 The research process and structure of Chapter 4 .....	104
Figure 4.2 The case companies as focal points .....	113
Figure 4.3 A multi-level case study approach .....	114
Figure 4.4 The research design .....	120
Figure 4.5 Stepwise data analysis .....	126
Figure 5.1 The structure of the case studies .....	134
Figure 5.2 The Anti-Whiplash Seat (WHIPS) and the recliner .....	188
Figure 6.1 Determinants of attraction .....	237
Figure 6.2 Conceptualization of attraction .....	247
Figure 7.1 Effects of attraction .....	265
Figure 8.1 The link between performance and learning .....	310
Figure 8.2 Model of the interaction of strategic behavior .....	324
Figure 8.3 Adaptations and extensions of model .....	325
Table 3.1 Building attraction .....	93
Table 3.2 Different types of attraction processes .....	95
Table 3.3 The treatment of the research questions .....	101
Table 4.1 Descriptions of the case companies .....	111
Table 4.2 The research questions and the research design .....	121
Table 4.3 Description of the interviews .....	124
Table 4.4 Description of the the secondary data .....	125
Table 5.1 Within-case analysis of DeLaval .....	160
Table 5.2 Within-case analysis of Autoliv .....	190
Table 5.3 Within-case analysis of Ericsson Multimedia .....	220
Table 6.1 Summary of the cross-case analysis .....	229
Table 6.2 Different types of attraction processes .....	231
Table 6.3 Determinants of attraction .....	246
Table 6.4 Importance of attracting external impulses .....	250
Table 6.5 The maturity of the product area .....	252
Table 6.6 The centrality of the product area .....	253
Table 6.7 System products vs. stand-alone products .....	254

Table 6.8 Structure of customer base and product portfolio.....	256
Table 6.9 The degree of complexity and turbulence.....	258
Table 6.10 The degree of concentration of innovative activity.....	260
Table 6.11 Summary of research questions 1 and 2.....	262
Table 7.1 Learning from meeting with the impulse providers .....	275
Table 7.2 Attraction as a source of diversity and variation .....	283
Table 7.3 Differences between search and attraction .....	285
Appendix A.1 Sources for Yamaha .....	340
Appendix A.2 Sources for Apple .....	341
Appendix A.3 Sources for Draper Fisher Jurvetson (DFJ) .....	343
Appendix A.4 Sources for Procter & Gamble (P&G) .....	344
Appendix B.1 Sources for DeLaval .....	346
Appendix B.2 Sources for Autoliv.....	348
Appendix B.3 Sources for Ericsson Multimedia.....	350
Appendix C.1 Questions to managers of the case companies .....	356
Appendix C.2 Questions to external innovators.....	357

# Chapter 1

## Introduction

“We want to become a powerful magnet, so that the needles in the haystack find us.” --Steve Jurvetson, *Managing Director of California-based venture capital firm Draper Fisher Jurvetson*

This statement from Steve Jurvetson points to a potentially important but under-recognized response to a well-known challenge that many firms face. In order to be successful at innovation, firms must sometimes reach beyond their immediate (local) contexts and identify valuable ideas and resources that are distributed across diverse settings in their external environments, and the response Jurvetson suggests is to work to *attract ideas and resources from outside the firm*. The statement suggests that the solution to the challenge of identifying distributed ideas and resources is not necessarily to intensify the firm’s own search efforts, but to ensure that the firm is *attractive* to external actors and thereby that the appropriate ideas and resources find the firm, rather than vice versa.

This notion of *attraction* and the idea of conceptualizing firms as *magnets* to which external ideas and resources are attracted constitute the conceptual starting points for this thesis. Empirically, this approach translates into a focus on the ideas and inventions that firms attract from the external environment and become exposed to *without having searched for them*, as well as on how this inflow of externally generated ideas and inventions influences firms’ potential for learning (March 1991, Levinthal & March 1993), innovation (Ahuja &

## *Attraction: A new driver of learning and innovation*

Lampert 2001, Danneels 2002), and ultimately, their prospects of renewing the basis of their competitive advantage (Burgelman 1991, Teece 2007).<sup>1</sup> Notably, the scope of the study is not limited to venture capital firms, such as Draper Fisher Jurvetson; the study will seek to determine whether similar dynamics apply to other types of firms, as well.

In this first chapter, the concept of attraction is further elaborated and positioned in relation to previous literature. The structure of the chapter is presented in Figure 1.1; it begins with a discussion of the role of so-called *local search* in the organizational behavior of established firms (Cyert & March 1963). The next section reviews some of the risks associated with local search, as well as previous work pointing to the importance of *non-local search and exploration in learning* (March, 1991, Rosenkopf & Nerkar 2001, Gupta et al. 2006), followed by a brief review of the mechanisms that drive non-local search and exploration (Burgelman 1983a, Regnér 2003, Rosenkopf & Almeida 2003), as well a discussion of how attraction fits into this context. The chapter is then concluded by establishing a preliminary purpose for the study and by discussing its expected contributions.<sup>2</sup>

Figure 1.1 Structure of Chapter 1



### **1.1 Innovation and local search in established firms**

In highly competitive and fast-paced industries, factors such as technological development, changes in consumer needs, and entrepreneurial efforts by new types of competitors constantly put incumbent

---

<sup>1</sup> The use of the magnet as a metaphor in the context of knowledge and innovation was first introduced by Doz et al. (2001). In their work, however, it is not firms that are depicted as magnets, but rather structures within firms that are depicted as such, such as a global customer account or an innovation platform that attracts knowledge that is dispersed *within* the firm.

<sup>2</sup> A number of definitions of key concepts and a brief outline of the structure of the thesis are also provided at the end of the chapter.



## Chapter 1

profit streams at risk, challenging firms to continuously commercialize new products and to upgrade their unique asset bases (Schumpeter 1934, Teece et al. 1997). In these dynamic environments, firms must continuously innovate and identify new opportunities if they are to survive and prosper (Teece 2007). Previous research also suggests that established firms excel at *the incremental innovation of existing products* (Christensen 1997). By setting up structured and routinized systems for innovation, firms can ensure the efficiency and predictability of their innovation processes and outcomes, and can thereby continuously develop and commercialize improved versions of their products, which in turn helps to sustain the firm's competitiveness (Baumol 2002).

Systematic and routinized innovation within established firms is typically dominated by *local search*, which can be defined as the inclination of firms to look for new information and solutions *in the proximity of their existing geographical, technological, and cognitive contexts*, as well as *in contexts where they have previously enjoyed success* (Cyert & March 1963, Nelson & Winter 1982, Stuart & Podolny 1996, Schildt & Laamanen 2006). This means that firms tend to focus their attention and resource allocation to areas within which they are already knowledgeable, which reinforces specialization and makes them even more capable within their existing areas of expertise. The concept of local search has long been recognized in the literature as a typical organizational behavior, and it has also been acknowledged as being a necessary *heuristic* in response to *bounded rationality constraints*, as it economizes with managerial attention and research and development (R&D) efforts that are scarce resources in firms (Simon 1955, Cyert & March 1963). Local search has also often been regarded as the *most efficient mode of search*, since the returns on investments in learning and innovation tend to be the highest in areas where the firm is already knowledgeable (Levitt & March 1988, Cohen & Levinthal 1990).<sup>3</sup> These benefits associated with local search are also reflected in the rapid pace at which established companies develop and release new products within their existing product areas (Baumol 2004).

---

<sup>3</sup> Kogut & Zander (1992) argue that as a firm moves away from its existing knowledge base, its probability of success in new business areas converges towards that of a start-up.

## 1.2 Exploration beyond local search

Other contributions have, however, questioned some of the virtues of local search and have pointed to certain risks and disadvantages of relying heavily on local search (March 1991, Levinthal & March 1993, Rosenkopf & Nerkar 2001). In the segment of the strategic management literature that focuses on *strategic change and the renewal of competitive advantage*, it has been argued, based on observations of notable failures of previously dominant firms, that excessive reliance on local search over time can tend to make firms *simplistic and myopic*, which puts them at risk of overlooking emerging threats, leaving them vulnerable to changes in their competitive environment (Leonard-Barton 1992, Miller 1993, 1994). It has further been suggested that local search can compel firms to overlook valuable opportunities that would require the firm to combine its existing asset base with resources and knowledge from non-local contexts, such as new technological areas or distant geographical locations (Rosenkopf & Nerkar 2001).<sup>4</sup>

Along these lines, March (1991) stresses that whereas local search supports specialization and the efficient exploitation of existing advantages, it also reduces the level of variation within the organization, which both limits a firm's potential for exploring new opportunities and reduces its capacity to adapt to environmental change (cf. Ashby 1956).<sup>5</sup> He therefore emphasizes that firms seeking to ensure their long-term survival need to strike a balance between, on the one hand, *local search and the exploitation of existing advantages*, and on the other hand, *non-local search and the exploration of new sources of advantage*. Empirically, Regnér (1999, 2003) finds that whereas local search tends to be effective in a stable environment and with respect to incremental innovation and gradual

---

<sup>4</sup> In addition, in the literature that conceptualizes innovation as novel combinations of previously separated knowledge elements (Nelson & Winter 1982, Kogut & Zander 1992), it has been suggested that the local environment may not contain enough variation to offer firms sufficient opportunities for knowledge combination and recombination, which can lead to decreasing returns on investments in R&D, which in turn ultimately lowers their innovative capacity (Rosenkopf & Nerkar 2001, Fleming & Sorenson 2004).

<sup>5</sup> Levitt & March (1988) further argue that local search and a high degree of specialization in existing strengths can create *competency traps* where firms get stuck in sub-optimal positions (cf. Levinthal 1997).

## Chapter 1

strategic changes, it is unlikely to produce radical innovations and major strategic re-orientations. Regnér (2001, 2005) further argues that local search is often insufficient when firms face high uncertainty and *complex foresight horizons*, and that the local search tendencies that characterize the regular innovation systems of established firms need to be complemented by other non-local search modes that are better suited to uncertain situations and non-linear strategic changes (Lane & Maxfield 1996).

In response to this increased attention to the potential hazards of over-reliance on local search and the emphasis on both the importance of non-local search and the generation of requisite variation for the long-term viability of firms, a substantial body of work has emerged which identifies mechanisms for exploration and non-local search through which firms can avoid the perils of becoming overly reliant on local search (Ahuja & Lampert 2001, Rosenkopf & Almeida 2003, Hill & Rothaermel 2003). Some of the key mechanisms that have been identified in the literature are *autonomous strategic initiatives* (Burgelman 1983a), *internal diversity* (Lyles & Schwenk 1992, Page 2007), *inter-firm collaborations and alliances* (Rosenkopf & Almeida 2003, Lavie & Rosenkopf 2006), *acquisitions* (Schildt & Laamanen 2006), *absorptive capacity* (Cohen & Levinthal 1990, Zahra & George 2002), and new *types of boundary-spanning search techniques* (Lakhani et al. 2007, Tapscott & Williams 2007, Jeppesen & Lakhani 2010).<sup>6</sup> These contributions show how autonomous strategic initiatives by entrepreneurial persons inside the organization, along with the use of extramural knowledge that is accessed through alliances or non-local search efforts, can moderate the common tendencies within established corporations towards local search, simplicity, and the routinization of innovation, and thereby can alleviate the negative aspects of these tendencies.

In this thesis, I build on these insights from the existing literature about the importance of exploration and non-local search for the identification of new opportunities and for a firm's ability to adapt to

---

<sup>6</sup> A central finding of this work is that exploration and the creation of requisite variation often is difficult to achieve within formalized R&D departments because these are, as suggested above, typically designed mainly for achieving efficiency in existing areas, rather than for costly exploration in new areas with uncertain benefits, which means that these complementary mechanisms are required in order to move beyond local search (Czernich 2004).

rapid changes in its competitive environment. As suggested at the beginning of this chapter, the approach of this study is based on the concept of *attraction*. I argue that this represents a previously *overlooked aspect* of the issues of exploration and non-local search, and an under-recognized mechanism through which firms can reach beyond the boundaries of their local contexts and gain access to new ideas, resources, and opportunities.

### **1.3 An attraction-based approach: Firms as magnets**

Recent empirical work suggests that established firms are frequently approached by external innovators who want to present inventions and “pitch” ideas for new products and strategies to them with the intent of initiating co-operations around technical development and/or commercialization (Regnér & Bohman 2009). That research also shows that this inflow can expose firms to new ideas and inventions that they had failed to identify through their own search and innovation activities. In this study, I draw upon this observation and focus attention on *the inflow of externally developed ideas and inventions* that firms become exposed to *without having searched for them*, and the opportunities that this inflow creates for firms. Significantly, with the exception of the above-mentioned study, this phenomenon has not been explicitly addressed previously, and thus seems to represent a gap in the literature about how firms innovate, identify new opportunities, and ultimately create new strategies (Tece 2007).

This empirical focus represents a shift in perspective as compared to the existing theories reviewed above; rather than focusing on *the search* that a focal firm conducts, I set out to look at the other side of the coin by focusing on ways through which focal firms are *being found*. This conceptualization of how firms become exposed to new ideas and inventions builds on the fact that all firms monitor and search their environment in pursuit of new opportunities. Hence, a *focal firm is not only a searcher but is also the target of other actors’ searches and opportunity recognition*. This may have negative consequences for the focal firm, such as imitation (Barney 1991, Zander 1991, Rivkin 2000), but it may also have positive consequences, such as when external actors identify complementarities between their ideas and inventions and the resources and capabilities of the focal

## Chapter 1

firm, which may lead to an inflow of externally generated ideas that promotes learning and innovation in the focal firm.

Conceptually, this approach represents a shift from the received perspective of analyzing firms as searchers toward understanding them as *magnets* or *fly-papers* to which new ideas and inventions from the external environment are *attracted*. Whereas the search concept has received extensive treatment in the literature (Cyert & March 1963, Stuart & Podolny 1996, Levinthal 1997, Siggelkow & Rivkin 2005), the concept of attraction has not been previously explored, which seems to point to an opportunity for conceptual development in response to this gap in the literature. Importantly, what distinguishes this approach from previous, search-based studies is not the emphasis on the use of external sources of ideas and inventions as such (which has been studied before<sup>7</sup>), but *the mechanism* through which firms become exposed to them. This mechanism is characterized by the fact that the external actors *self-select to approach the focal firm* and that *the initiative* of presenting the idea or invention to the focal firm originates outside of that firm.

To better understand how this attraction-based approach differs from the received search-based theories, consider the analogous case of the ways in which people seek out employment opportunities. In some cases, a jobseeker initiates the search process by actively combing the job market for new opportunities, which is in accordance with the received search-based perspective. However, in other instances, a candidate may be targeted by a headhunter or recruitment firm, and thereby becomes exposed to a new employment opportunity *without having searched for it*. In the former case, the opportunity was a consequence of the search undertaken by the focal person, whereas in the latter case it was *the search of the other actor*, and more specifically, *that actor's perception of a good fit between the person and the job* that exposed the focal candidate to the opportunity. Consequently, if we want to understand why this particular individual became exposed to that employment opportunity, we must look beyond the search routines of that individual and instead assess why he or she was *visible, findable, and attractive* to the other actor and was therefore approached and presented with the opportunity (cf. Turban & Cable 2003).

---

<sup>7</sup> See for instance Von Hippel (1988), Rothaermel (2001), and Chesbrough (2003a).

### *Attraction: A new driver of learning and innovation*

This discussion suggests that taking an attraction-based perspective points to *a new set of questions* and *a new set of explanations* about how and why actors gain access to new opportunities when compared to existing search-based theories. This thesis is, as suggested above, predicated on the assumption that a similar logic applies to firms with respect to the identification of opportunities to develop new products or new technologies, and that in order to understand and explain what determines the pool of ideas and inventions from which firms can select their future products, technologies, and strategies, we must not focus solely on the properties of their search routines; instead, we must broaden the scope of the question to study the features of firms that *attract interest* and which *trigger inflows of externally generated ideas and inventions*. Metaphorically speaking, I argue that whereas the extant literature has focused on firms' "falcon capabilities," in terms of *the sharpness of their vision* with respect to their ability to identify new opportunities (Makadok & Barney 2001, Teece 2007), there is also reason to study firms' "peacock capabilities," in terms of their *propensity to attract the attention of external actors* and make them inclined to approach the firm to present new ideas and inventions, if we want to understand what determines their potential for innovation and opportunity identification.

One key consideration with respect to the relevance of studying this other side of the coin is that based on the findings of Regnér & Bohman (2009), as well as the recruitment example described above, there is reason to believe that the attraction of externally generated ideas and inventions can potentially inform firms about things that they otherwise would have *overlooked*, and thereby *expand the pool of ideas, inventions, and opportunities from which they can select their future products and strategies*. Consequently, I contend that attraction represents a significant phenomenon that is worthy of further study.

#### **1.4 Purpose, empirical focus, and expected contribution**

Based on the reasoning set forth in the previous sections, the purpose of the study is to investigate attraction and thereby to offer an alternative perspective on how firms explore new opportunities and discover non-local ideas and innovations, in order to further our understanding of how firms can sustain and renew their competitive ad-

## Chapter 1

vantage over time through learning and innovation. As part of this ambition, the study also aims to outline how attraction differs from search-based exploration mechanisms that have been identified in the extant literature. As stated previously, the approach that will be used to achieve this aim is to study empirically the inflow of externally generated ideas and inventions that firms receive as a result of external actors approaching them to present them with their ideas and inventions.

Having established that the focus of this thesis will be on the *exploration of new opportunities* rather than the exploitation of existing strengths (March 1991), it is important at this point to stress that this choice does not imply that that exploration in any way is “better” or more important than exploitation. Instead, this focus reflects the previously discussed finding of previous studies that large established firms tend to let the exploitation of existing advantages *crowd out* more exploration-oriented activities (Miller 1993); a tendency that, as previously emphasized, can make them overlook emerging opportunities or threat. Therefore, it is deemed relevant in this thesis to focus on the ways in which exploration of novel, non-local opportunities can be channeled into established firms.

★ ★ ★

After having formulated the purpose of the study, the expected contribution of the thesis can also be outlined. First, the study seeks to provide a descriptive empirical account of the phenomenon of interest, namely, that firms exert attraction on actors in their external environment and that they receive, as a result of this, an inflow of externally generated ideas and inventions. Since this phenomenon has not before been systematically studied, I argue, in accordance with King et al. (1994), that a careful *descriptive account* in itself, along with an evaluation of how significant the phenomenon indeed is, could potentially constitute a contribution to the literature. Specifically, such a description can be expected to add to the literature that has described various drivers of exploration of non-local ideas and innovations, such as autonomous strategic initiatives (Burgelman 1983a,b, Regnér 1999, 2003), experimentation within the organization (Ahuja & Lampert 2001), and boundary-spanning external search (Rosenkopf & Nerkar 2001, Jeppesen & Lakhani 2010).

*Attraction: A new driver of learning and innovation*

Second, the study seeks to contribute to existing theories that delineate and predict the ways in which firms learn, innovate, and create new strategies. More precisely, the study seeks to add to the literature pertaining to theories about: (i) organizational search (Cyert & March 1963, Greve 2003, 2007), (ii) dynamic capabilities (Teece et al. 1997, Winter 2003, Teece 2007, Helfat et al. 2007), and (iii) strategy creation in large, established firms (Burgelman 1983b, Regnér 2003) by exploring whether and how the predictions of these theories are influenced when the possibility of attraction is also taken into account.

Specifically, the study addresses Cyert & March's (1963) predictions about how the local and motivational nature of firms' search limits the extent to which they identify new and more optimal solutions, by arguing that introducing the possibility of attraction makes these limitations less restrictive than what has previously been assumed. The study further challenges one of the tenets of the dynamic capabilities view, which is that a firm's capacity to successfully renew the basis of its competitive advantage depends on the firm's (internal) dynamic capabilities, by pointing to the notion that external actors' perceptions of the firm and their inclination to approach it with new ideas and innovations also plays a role in determining the firm's potential for learning and innovation and thereby its prospects of successfully renewing the basis of its competitive advantage. Finally, the study expands on Burgelman's (1983b) notion that strategy creation in established firms is determined by the ecology of strategic initiatives that emerges within the firms, by showing that in addition to the previously recognized internal ecologies of initiatives, *external ecologies of initiatives* tend to emerge around established firms, which also contribute to strategy creation in these firms.

In addition, certain novel managerial implications are also anticipated to emerge from the study. Specifically, the study is expected to identify a set of activities that contribute to making firms attractive to external innovators and which entice a diverse group of external actors to approach the firm with their ideas and inventions.

★ ★ ★

Having outlined the conceptual arguments underlying the study and established the purpose and the expected contributions of the study in this introductory chapter, the next chapter will offer a more in-



## Chapter 1

depth discussion of the ways in which this topic relates to existing literature by reviewing and discussing theoretical and empirical antecedents. Before moving to the next chapter, however, I will provide a number of operational definitions of key concepts that feature prominently in the study, as well as a brief outline of the structure of the thesis.

### 1.5 Definitions

#### Attraction and search

As has been made clear in the previous sections, *attraction and search* are two key concepts in the study. In order to clarify how they relate to each other in this study, I will make a distinction here. The term 'search' refers to the activity that occurs when *a focal firm actively looks for something*, either by means of searching its external environment or by means of internal innovation.<sup>8</sup> 'Attraction,' on the other hand, refers to a process in which *external actors self-select to present themselves and their ideas to the focal firm*, whereby the focal firm becomes exposed to a new idea or opportunity without having engaged in search or having initiated the contact with the external actor.

It is also important to note that search and attraction are not mutually exclusive processes. A certain course of events, such as in the recruitment example discussed previously, can be analyzed either from a search perspective or an attraction perspective, depending on which actor is *the focal point* of the analysis. Importantly, however, attraction is *not* merely a mirror process of search. When a firm attracts an external idea, this may or may not contain an element of search on the part of the external provider of the idea. In some cases, the focal firm may be selected by the external actor after a search process has occurred, but in other instances, the external actor may have become attracted to approach the focal firm without having conducted any prior search.

For the purposes of this thesis, which is geared towards an assessment of learning, innovation, and strategy creation, I will further delineate the kinds of activities and processes that constitute attrac-

---

<sup>8</sup> This definition of search, which includes both external search and internal innovation, is consistent Rosenkopf & Nerkar's (2001) operationalization of the concept.

### *Attraction: A new driver of learning and innovation*

tion. External actors may self-select to approach the focal firm for a number of reasons, but in this context, attraction refers to those instances in which an external actor approaches the firm with an idea, a concept, a technology, or some other resource that it seeks to combine with the resources of the focal firm in ways *related to the development of new products or new technologies* (Danneels 2002). Likewise, the concept of search also refers to activities related to innovation and the development of new products or technologies.

#### **The attraction mechanism**

This term is used as a general term to denote the different types of processes through which firms become exposed to opportunities as a result of external actors approaching them to present an idea, a concept, a technology, or some other resource.

#### **External impulses and external ideas and inventions**

The terms 'external impulses' and 'external ideas and inventions' are used interchangeably in the thesis as umbrella terms to denote the ideas, inventions, prototypes, concepts, technologies, etc., that a focal firm receives from external actors.

#### **Impulse provider and recipient firm**

The term 'impulse provider' is used to denote the external actors who approach a focal firm to present ideas or inventions. Once the focal firm has been approached by an external actor, it is in turn referred to as the 'recipient firm.'

#### **Opportunity**

In this context, an opportunity is defined as the chance to supply an unmet market need (or interest or want) through a creative combination of resources (Sarasvathy et al. 2002, Shane 2003).

## **1.6 Outline of the thesis**

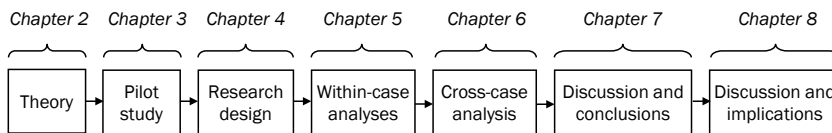
In *Chapter 2*, the research gap that is addressed in this study is formulated more precisely based on an in-depth discussion of empirical and theoretical antecedents. The discussion and the formulation of the research gap in turn results in the decision to structure the em-

## Chapter 1

pirical inquiry as a two-stage study consisting of a pilot study followed by a more in-depth main study. In *Chapter 3*, the results of the pilot study, which consists of four case studies, are reported, based on which a number of preliminary concepts are developed and a final set of research questions are formulated. In *Chapter 4*, the research design of the main study is presented, along with the methods that were employed for data collection and data analysis. The study employs a multiple-case study design and is focused on three Swedish multinational companies: Autoliv, DeLaval, and Ericsson. Notably, the case study is conducted on multiple levels (industry-level, firm-level, and the level of individual innovation processes) and focuses both on the case companies and external actors in the environment around the case companies.

*Chapter 5* contains the first-order empirical analysis, where the findings of the empirical study are presented in the form of case descriptions followed by within-case analyses for each case. In *Chapter 6*, the second-order analysis is conducted whereby the findings of the within-case analyses are compared and analyzed in a cross-case analysis. In *Chapter 7*, the findings of the previous chapters are further synthesized and conceptualized in order to outline what is distinctly unique about attraction compared to search-based exploration mechanisms. In this chapter, a set of propositions are also developed which summarize the conclusions of the study. Finally, in *Chapter 8*, the findings of the study are related to prior theory in order to outline how the study contributes to the extant literature in terms of its theoretical implications.

**Figure 1.2** Outline of the thesis





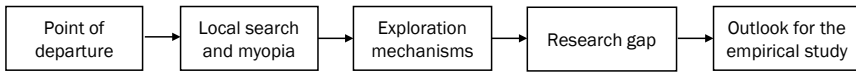
# Chapter 2

## Theory

Although the empirical phenomenon that is targeted in this thesis remains largely unexplored, and though attraction is a novel concept in this context, the questions pursued in this study still represent a subset of the larger issue of how new strategies develop and how firms sustain their competitive advantage through learning and innovation, which are questions that have been explored from different theoretical perspectives and in different empirical settings (Penrose 1959, Teece et al. 1997, Teece 2007). In this chapter, I discuss how existing theories pertaining to this topic relate to the attraction concept. The structure of the chapter is presented in Figure 2.1.

The chapter starts with a brief overview of this literature, followed by a discussion of the factors that limit firms in their ability to innovate and adapt, which is specifically focused on the limitations that are related to firms' search routines and ingrained, dominant ways of thinking within these firms. This section is followed by a further discussion of the different mechanisms that have been shown in the literature to alleviate these limitations. Based on this discussion, a research gap is then established and delineated, after which the chapter concludes with a brief outlook towards the empirical inquiry.

Figure 2.1 Structure of Chapter 2



## 2.1 Point of departure: A dynamic perspective on strategic management and competitive advantage

The willingness and ability of established firms and individual entrepreneurs to create and commercialize new products, services, and technologies based on novel insights and ideas are key driving forces of economic development (Schumpeter 1934, Baumol 2002). The creation of novelty is also fundamental to the performance of individual firms, as established firms that are unable to develop new products and renew their processes and structures inevitably become replaced by other firms as part of the process of *creative destruction* (Schumpeter 1934). Especially in business environments characterized by technological change and rapid imitation, firms need continuously to identify new opportunities, innovate, and invent new ways of creating value (Teece et al. 1997, O'Connor & Rice 2001, Teece 2007).

Because of the fundamental importance of innovation and the renewal of products and strategies for the long-term success of firms, strategic management scholars have paid increasing attention to these issues in recent years (Moran & Ghoshal 1999, Teece 2007). This development is reflected in the strong interest in both *the dynamic capabilities view* of competitive advantage (Teece et al. 1997, Eisenhardt & Martin 2000, Pierce et al. 2002, Winter 2003, Helfat et al. 2007, Danneels 2008) and *the knowledge-based view of the firm* (Kogut & Zander 1992, Nonaka et al. 2000), as well as in the efforts to integrate the scholarly fields of *entrepreneurship and strategic management* (Burgelman 1983a, Rumelt 1987, Ireland et al. 2003). As part of this development, the concepts of *learning* and *innovation* have attracted increasing attention as explanations of the central questions of how strategies are created and what enables firms to create and maintain competitive advantage (Barr et al. 1992, Eisenhardt & Martin 2000, Crossan & Berdrow 2003, Teece 2007). These dynamic perspectives on strategic management, based on learning

## Chapter 2

and innovation, can be contrasted to two of the more influential streams within strategic management research, namely, *the industry analysis perspective* on strategy (Porter 1980) and *the resource-based view* (Barney 1986, 1991, Peteraf 1993). Whereas both of these research streams focus primarily on how value is distributed between actors and how firms can preserve a competitive advantage in the face of the eroding forces of imitation and competition, the dynamic approaches concentrate on *the process of value creation, how new innovations create and shape the origins of favorable market or resource positions, as well as on how these are modified and enhanced over time* (Kogut & Zander 1992, Thomke & Kuemmerle 2002, Teece 2007).

This study is firmly positioned within the dynamic literature stream, as it addresses, on a general level, the different factors that enable and restrict firms in their efforts to sustain their competitive advantage over time through learning, innovation, and the identification of new growth opportunities, and more specifically, delineates how the attraction of externally developed ideas and inventions influences these processes and outcomes.

### **2.2 Challenges associated with innovation and strategic adaptation**

As the roles of learning and innovation in determining the long-term success of corporations have been recognized for some time, the demands for innovation and dynamism are also strongly reflected in the structures, activities, and resource allocations of most firms (Baumol 2002, 2004). Many firms seek to develop *dynamic capabilities* by allocating significant resources to innovation, information acquisition, and strategy development (Eisenhardt & Martin 2000, Helfat et al. 2007). To this end, most large firms have also formal units dedicated to forward-looking activities such as R&D, business development, and strategic planning. However, previous studies show that investing in these types of activities does not provide a guarantee for long-term success, and further, that established firms sometimes fail to respond in a timely and accurate manner to changes in their environment (Barr et al. 1992, Tripsas 1997). Christensen (1997) and Tripsas & Gavetti (2000), for instance, show how established firms

fell victim to different forms of inertia and thereby lost their dominant positions as their industries underwent changes (cf. Rumelt 1995).

### **2.2.1 Myopia**

Teece (2007) argues that sensing opportunities and threats represents a significant challenge for established firms, as it often requires them to reach beyond their regular search horizons and to combine disparate pieces of information in novel and complex ways. As a result of the difficulty of the task, Pierce et al. (2002) further stress that the ability to notice dispersed information and translate it into actionable opportunities and threats represents an important aspect of a firm's dynamic capability and a potential source of competitive advantage (cf. Makadok & Barney 2001). Conversely, however, whereas superior ability to collect and interpret information is argued to be a source of competitive advantage, *myopia*, as manifested in the inability to recognize emerging opportunities and threats, and the failure to make sense of the incoming information, has also been shown to be an important reason why established firms at times fail to renew their product portfolios and adapt their strategies in response to changes in their environment (Barr et al. 1992, Levinthal & March 1993, Miller 1994, Rumelt 1995).

Important underlying causes of such myopia-induced failures are (i) *established routines for innovating and collecting information*, which bias the firm toward searching in areas that have been useful in the past (Cyert & March 1963, Becker 2004), and (ii) *established and rigid knowledge structures*, which lock firms into established ways of thinking and interpreting information (Barr et al. 1992, Tripsas & Gavetti 2000).

### **2.2.2 Local search routines**

With respect to the first explanation, Nelson & Winter (1982) show that the search activities in firms over time tend to become increasingly routinized, as the innovation-generating activities proceed according to the organization's rules and standard procedures in pursuit of clearly defined goals (Baumol 2002, Czernich 2004). Miller (1994) further points to the fact that firms develop highly structured routines for information acquisition in order to reduce the costs of these activities. The existence of such routines implies that firms engage in limited search activities and selective acquisition of informa-



## Chapter 2

tion and knowledge from within their existing frames of reference. This behavior is also consistent with the previously mentioned tendency of firms to search for new information and solutions *in the proximity of their existing geographical, technological, and cognitive contexts, as well as in contexts where they have previously enjoyed success* (Cyert & March 1963, Levitt & March 1988, Stuart & Podolny 1996).<sup>9</sup> As suggested in the introduction, under stable conditions, such routinized local search processes are efficient and can be a powerful tool for dealing with bounded rationality constraints, as they economize with costs and scarce managerial resources (Simon 1955). However, the problem is, as Miller (1994) emphasizes, that such ingrained search routines will over time tend to *institutionalize gaps in firms' intelligence and information acquisition*, which can cause them to fail to notice and analyze emerging opportunities and threats, particularly if these emerge in new areas not covered by the existing search routines.

### 2.2.3 Ingrained knowledge structures

With respect to the second cause of organizational myopia, many previous studies have established that decision-makers in firms employ cognitive representations, which Walsh (1995) calls *knowledge structures*, to simplify and make sense of the complex environments with which they grapple (Porac et al. 1989).<sup>10</sup> Such knowledge structures are valuable for individual managers, as they help them to translate their accumulated experience and knowledge into decisions about future actions (Gavetti & Levinthal 2000). Shared knowledge structures, or so-called *dominant logics*, are also important from the organizational perspective as a means for coordinating decisions and actions, as well as for storing and disseminating collective organizational wisdom (Prahalad & Bettis 1986). However, for the same reasons that they are useful, namely, because they link prior experience

---

<sup>9</sup> The work of Nelson & Winter (1982), Dosi (1982) and Patel & Pavitt (1997) further demonstrates that the outcomes of previous R&D searches tend to constitute natural starting points for new searches and that firm strategies and growth trajectories therefore are subject to *path dependencies*, meaning that the development of new capabilities builds on existing capabilities and that innovation mainly takes place in areas where the firm is already knowledgeable (cf. Bhardawaj et al. 2006).

<sup>10</sup> Simon (1991) even argues that a firm's choice of strategy is a by-product of managers' cognitive representations of the environment and the problems that the firm faces.

to decisions about future actions, dominant logics can also be problematic if the environment changes and the knowledge structures are no longer valid. This would be unproblematic if such knowledge structures were highly plastic and could easily adapt in response to new information. However, Barr et al. (1992) show that knowledge structures typically are inert, and that it often takes a long period of time for them to change. As a consequence, established knowledge structures can act as *blindners* which hinder firms from identifying new types of opportunities. This problem is demonstrated empirically by Tripsas & Gavetti (2000), who find that even if a firm has access to the relevant information and possesses the right capabilities, obsolete knowledge structures can impede the firm from responding accurately to environmental changes, as they make the firm misinterpret the information and therefore deploy its capabilities in the wrong way.

#### **2.2.4 Prior success**

Importantly, the literature suggests that the problems associated with both established routines (for innovating and collecting information) and rigid knowledge structures are potentially greater if the firm has previously experienced substantial success, since this tends to reassure the firm that it is doing the right things, which in turn weakens its motivation to look for alternative ways of thinking or acting (Miller 1994). The role that success plays in reducing a firm's inclinations to search outside of its current frame of reference and for reducing its propensity to modify its knowledge structures is also consistent with Cyert & March's (1963) proposition that organizational *search is motivationally driven*, which means that firms primarily engage in search for new solutions in response to either concrete problems or a discrepancy between current performance and their aspiration level (cf. Lant & Montgomery 1987, Greve 2003, 2007).

In sum, this suggests that established firms suffer from the fact that the same routines, cognitions, and capabilities that were the basis for their historical successes can become liabilities as the environment changes, because they weaken firms' perceptiveness to changes and their capacity for adaptation (March 1991, Leonard-Barton 1992, Miller 1993, 1994). Specifically, previously effective search routines for acquiring information may, as the environment changes and new and important sources of information emerge, create myopia and cause the firm to overlook or misinterpret certain

## Chapter 2

information (Levitt & March 1988, Barr et al. 1992, Levinthal & March 1993).<sup>11</sup> This in turn means that any given firm typically can only notice *a subset of all relevant information*, and that it consequently can only identify *a subset of all opportunities* that it could potentially have benefitted from, and further, that it at times will fail to identify emerging threats.

### 2.2.5 The role of attraction

The question that is raised in this study is how the attraction of external ideas and inventions is related to this problem, and to what extent it can *moderate such myopia* that is induced by local search biases and ingrained knowledge structures. Based on the discussion of the previous chapter, which suggested that attraction can provide a firm with *different input than its own search processes*, I suggest that attraction can potentially widen the scope of firms' "vision" and thereby represents an exploration mechanism through which firms can overcome some of the limitations associated with local search biases and ingrained knowledge structures, and thereby can act as a possible antidote to some of the problems discussed in this section.

As an illustration of this conjecture, imagine a firm that could benefit from combining some of its ideas, resources, or capabilities with those of 20 other firms. However, in order to benefit from these combinatorial opportunities, the focal firm must become aware that the other companies exist and be able to identify these synergies. Assume further that the firm, because of limits to the scope of its search routines and its cognitive ability to translate information into opportunities, is only able to identify 10 potential partners (Cyert & March 1963, Shane 2000). Hence, left to its own search and interpretive processes, the firm would have overlooked 10 opportunities. However, if one assumes that these potential partners are also trying to identify the same set of combinatorial opportunities and that the opportunity recognition of the focal firm and the other firms are partly asymmetrical, some of the opportunities that the focal firm was unable to identify itself, it will still be informed of because the other

---

<sup>11</sup> Such early failure to identify changes that emerge outside of the scope of current search routines can have important implications for a firm's ability to retain competitive advantage, since early opportunity recognition based on superior information has been identified as a key basis for creating competitive advantage and earning supernormal returns (Barney 1986, Makadok & Barney 2001).

party could identify the opportunity and subsequently approach the firm to present the opportunity. In this way, the focal firm will be able to benefit from more than the 10 opportunities that it was able to identify through its own search, since the external actors could identify a number of the opportunities that the firm itself failed to notice.

★ ★ ★

Importantly, however, just as these myopia-induced problems have been identified in previous studies, a number of mechanisms other than attraction, which can help alleviate these problems, have also been explicated in the extant literature. In order to outline how attraction differs from these existing concepts, the following section reviews and discusses previously identified mechanisms through which firms explore and supersede their existing boundaries in terms of their search routines, knowledge structures, and existing areas of expertise, in relation to the attraction concept.

## **2.3 Exploration mechanisms**

A review of the literature shows that a substantial body of work has emerged that addresses the problems associated with myopia and overly local search, and which points to mechanisms that can counteract these tendencies, and can contribute to the exploration of non-local opportunities and radical innovations (Ahuja & Lampert 2001, Hill & Rothaermel 2003, Rosenkopf & Almeida 2003). In the following section, these mechanisms are discussed in relation to the attraction concept in order to more precisely delineate the research gap that will be addressed in the subsequent empirical inquiry.

### **2.3.1 Internal exploration**

#### **Internal diversity**

One mechanism that is commonly advanced in the literature as a means of decreasing the risks of myopia and of becoming locked into obsolete knowledge structures is *internal diversity*. Lyles & Schwenk (1992) and Page (2007) assert that diversity tends to increase a firm's repertoire of methods of handling different types of situations, facilitating more effective problem solving, and stimulating innovation and

## Chapter 2

the recognition of new opportunities. Hargadon & Sutton (1997) further demonstrate that diversity creates the possibility of combining different bodies of knowledge in new ways, which can be a potent driver of non-local innovation. Diversity can be manifested in different ways, including: (i) technological diversity, in the sense that not all resources are focused on one core technology; rather, the firm makes targeted investments in alternative technologies (Granstrand et al. 1997, Ahuja & Lampert 2001); (ii) cognitive diversity, in the sense that people with different experiences, perspectives, and worldviews are represented within the organization (Lyles & Schwenk 1992, Page 2007); (iii) diversity in the practices and activities upon which the organizational members draw (Whittington 1996, Regnér 2003); and (iv) diversity in the norms that govern behavior within the organization (Scott 2001, Jonsson & Regnér 2009).

The presence of variation and diversity within the organization influences a firm's capacity for exploration and can mitigate myopia and local search biases in different ways. First, different people within the organization who have divergent knowledge structures and who draw upon different practices and activities tend to search for information and solutions in different ways, and thereby notice different sets of information and solutions, broadening the firm's search scope or "field of vision" and decreasing the risk that relevant information will be overlooked (Page 2007). Second, as illustrated by the literature on opportunity recognition, people with different experiences and knowledge structures tend to recognize different opportunities even if they are exposed to the same information (Kirzner 1997, Shane 2000). As such, cognitive diversity among actors within a firm can decrease the risk that the firm will overlook vital opportunities or threats as a result of a failure to interpret existing information.<sup>12</sup>

### **Autonomous strategic initiatives**

An important consequence of cultivating diversity in technologies, cognitions, practices, and norms within a firm is that it tends to sup-

---

<sup>12</sup> In addition to these effects of diversity, technological diversity within the organization can also be expected to make it easier for the firm to adapt the organization's technological base to new requirements. In this manner, harboring technological diversity can be seen as an option to do other things in the future, making the firm more adaptable to new opportunities and threats (Kogut & Zander 1992).

*Attraction: A new driver of learning and innovation*

port the emergence of so-called *autonomous strategic initiatives*. This term was coined by Burgelman (1983b), who made the distinction between induced strategic initiatives, which originate with the firm's regular innovation system and build upon the existing corporate strategy, and autonomous strategic initiatives, which originate outside of the regular corporate innovation system and depart from the extant corporate strategy (Lovas & Ghoshal 2000, Czernich 2004). Autonomous initiatives have been shown to originate with entrepreneurial people inside firms who are relatively unrestricted by the current corporate strategy, the organization's dominant logic, or its established search routines (Regnér 1999, Mantere 2005, 2008). Consequently, these individuals tend to draw upon different technologies, cognitions, and practices, which in turn prompts them to respond to a different set of opportunities compared to those identified by the standard corporate system for information acquisition, innovation, and strategy development (Regnér 2003). Burgelman (1983b) further shows that autonomous initiatives, as a consequence of their departure from the established search patterns and mindsets within the firm, generally have a high potential to drive *radical strategic re-orientations*.

In conclusion, this line of inquiry suggests that a high degree of internal diversity tends to create a *varied ecology of search and innovation efforts*, resulting in the emergence of strategic initiatives in response to a broad range of perceived opportunities and threats. The emergence of such an ecology of initiatives has the beneficial effect of making a firm less likely to be blindsided by changes in its environment that fall outside of its established routines for information acquisitions or that cannot be properly interpreted within the framework of the firm's dominant logic (Prahalad & Bettis 1986).

However, after having discussed the benefits of internal diversity and autonomous strategic behavior in making firms more resilient, flexible, and capable of adaptation, it also important to point out that this type of diversity and experimentation also tends to render firms *less efficient* at any given point in time, making the level of variation an aspect of the general trade-off between exploration and exploitation in learning, where excessive exploration leads to inefficiency and excessive exploitation leads to decreased a capacity to adapt to emerging opportunities and threats (March 1991).

## Chapter 2

### External initiatives as a potential research gap

Clearly, the literature pertaining to internal diversity and strategic initiatives contains important insights about how firms overcome the perils associated with local search routines and rigid knowledge structures, as it outlines an essential mechanism through which non-local opportunities are identified and how these can drive radical innovation and strategic change. However, I argue that a significant research gap remains to be explored in conjunction to this literature. Notably, the previous literature has largely assumed that the variation-induced strategic initiatives that influence a certain firm arise *within* that firm. In other words, the existing literature has focused on the variation that exists within the firm and its *internally generated ecology of initiatives*. In contrast, this thesis relaxes the assumption that strategic initiatives originate inside the focal firm by taking the variation that exists *outside of the focal firm* into account and by opening up the possibility of *an ecology of externally generated initiatives* that are directed at a focal firm. I suggest that a study of externally generated initiatives extends the arguments reviewed above and that this conceptual extension represents a potentially interesting research opportunity to gain more knowledge about the mechanisms through which firms overcome the myopia-related limitations associated with local search routines and rigid knowledge structures.

However, having argued that the area of externally generated initiatives represents a potential research gap, it is important to note that whereas the literature discussed in this section is focused on the internal processes within firms, the role of external influences in firms' innovation and strategy development processes have received attention in other research streams, such as the literatures pertaining to *the origins of innovation* (von Hippel 1988), *alliances* (Gulati 1998), and *open innovation* (Chesbrough 2003a,b). Therefore, in the following section, the attraction-based approach advanced in this thesis will be compared and contrasted to the existing literature that addresses these facets of the issue in order to further delineate the research gap that is targeted in this study.

### 2.3.2 Exploration by identifying and accessing external knowledge

Previous studies demonstrate that complementing a firm's internal knowledge base with external ideas, knowledge, and innovations is an important way of avoiding becoming trapped by the limitations inhe-

rent in local search (Rosenkopf & Nerkar 2001, Dushnitsky & Lenox 2005, Cassiman & Veugelers 2006). In response to this insight, an extensive literature has emerged that is focused on the mechanisms through which firms can gain access to external knowledge and innovation (von Hippel 1988, Rosenkopf & Almeida 2003, Chesbrough 2003a, Tapscott & Williams 2007). Since the essential feature of attraction is that it exposes the focal firm to external ideas, innovations, and knowledge, this body of literature is relevant for this study, and consequently, in the section below, the attraction concept is discussed in relation to other, previously identified mechanisms through which firms gain access to external knowledge and innovation.

### **User-driven innovation**

A key mechanism through which firms can broaden the scope of their innovation and strategy development is to draw upon the innovation of their existing customers and suppliers. In his 1988 study, von Hippel traces *the origins of innovations* in several industries. He finds that in contrast to the then-received view that innovations originate within the same firms that ultimately commercialize and manufacture the (innovated) products, many innovations actually originate among the external actors that benefit from them, either as users or as suppliers of components to the innovation. This study has subsequently been followed by further work about especially *user-driven innovation*, which shows that so-called *lead users*, in particular, often possess significant innovative capacity, which firms can at times systematically leverage through the use of innovation tool kits and user communities (von Hippel 1986, Jeppesen & Molin 2001, von Hippel & Katz 2002, Tapscott & Williams 2007).

The literature pertaining to the origins of innovations and user-driven innovation processes has carefully outlined the roles of existing customers and suppliers in firms' innovation processes, and has added significantly to the general knowledge about external influences in firms' innovation processes (von Hippel 2005, Baldwin et al. 2006). Notably, however, this literature has also largely neglected the role of other types of actors in firms' innovation processes. Other studies indicate that this gap can be of significance with respect to the challenge of avoiding the perils of local search. Whereas drawing upon the innovative capacity of its existing customers and suppliers is known to extend the scope of a firm's innovation, the work of Christensen & Rosenbloom (1995) and Christensen & Bower (1996)



## Chapter 2

also demonstrates that a strong reliance on the innovation of its existing customers can in itself become a source of myopia and inertia, as it can make the firm *overly focused on existing products and customers*, which may induce them to overlook new, emerging technologies, product categories, or customer groups.<sup>13</sup>

### Knowledge networks and alliances

Subsequent contributions have, however, extended the scope of the analysis beyond the dyadic relationships with customers and suppliers that were described in the previous section, to include *the wider network of external actors* constituted not only by customers and suppliers, but also by other firms, universities, research institutes, and independent inventors (Laamanen & Autio 1996, Gulati et al. 2000, Powell et al. 2005). Powell et al. (1996) argue that in order to gain access to relevant knowledge that is widely dispersed and difficult to produce within the firm, it is necessary to actively participate in *knowledge networks* (cf. Teigland 2003). They also show empirically that in the bio-technology industry, superior network centrality and greater accumulated experience managing ties within the network positively influences subsequent growth due to the increased number of opportunities that a firm becomes exposed to as a result of its network position (cf. Arenius & De Clercq 2005). The notion that favorable network positions are a source of new opportunities is also advanced by Burt (1992, 2004), who argues that firms that bridge *structural holes* in a network are more likely to come up with good ideas, as they are more likely to be able to *combine previously unconnected information*.

Other studies of the bio-technology industry further point to how forming technology alliances with partner firms can be a powerful driver of innovation (Haagedorn & Duysters 2002, Rothaermel 2001). This literature stream particularly stresses that established firms can leverage their existing resources, such as existing brands or sales channels, so-called *complementary assets* (Teece 1986), by engaging in alliances that allow them to combine their resources with innova-

---

<sup>13</sup> This notion that a firm's close network partners, such as its existing customers and suppliers, may at times fail to inform firms about important novel information is also related to Granovetter's (1973) findings that *weak network ties* are more likely to provide an actor with novel information and opportunities compared to its *strong network ties*.

tions that have been developed by smaller firms that lack the kind of complementary resources that are necessary to commercialize the innovations (Laamanen & Autio 1996, Gans & Stern 2002, King et al. 2003, Rothaermel & Boeker 2008). This literature implies that such alliances with entrepreneurial firms can allow established firms to broaden the scope of their exploration and to gain access to more radical innovation than what they could have achieved internally (Lavie & Rosenkopf 2006).<sup>14</sup>

### **Positioning the attraction concept vis-à-vis the extant literature**

The literature about the origins of innovation and the literature about knowledge networks and alliances both have significant implications for the current study. First, both Von Hippel's research and the alliance literature show how the initial innovation behind the capture of an opportunity may originate somewhere other than within the firm that later commercializes it, which is also a fundamental contention upon which the current study rests. Second, the attraction-based approach advocated in this thesis shares a key assumption with the network analysis approach, namely, that access to external innovation and new opportunities is a function not only of the search routines and opportunity recognition processes of a focal firm, but also of factors that lie outside the boundaries (and partially outside the control) of the focal firm. Third, the alliance literature points to how links to external innovators can increase a firm's innovativeness and the scope of its exploration (Shan et al. 1994, Deeds & David 1996).

However, significant differences also exist between the attraction-based approach that is advocated in this study and the existing literature. First, with respect to the literature about the origins of innovation, this study takes *a more explicit process perspective*, as it moves beyond the question of *where* the innovation originates to also study *the micro-processes through which a firm becomes exposed to the external innovations*. Specifically, this study distinguishes between the innovations that a firm identifies through its own search and those that it attracts and becomes exposed to as a result of external actors self-selecting to approach it. This, in turn, opens up a

---

<sup>14</sup> A variation of this approach is when established firms make *equity investments* in entrepreneurial ventures, so-called *corporate venture capital*, which has been investigated by Dushnitsky & Lenox (2005, 2006).

## Chapter 2

set of questions that are not addressed in the existing literature, such as why some firms attract external innovations while others do not, and which factors determine where new ideas and innovations that emerge within an industry are channeled and by what firms they are ultimately commercialized.

Second, analogous to how the network-based perspective extends the scope of the dyadic studies of customer or supplier relationships, this study extends the perspective beyond firms' existing networks, as *the attraction-based approach makes no assumption that network ties must exist in order for attraction to occur*. In effect, the position in a network structure is only one of many factors that can make a firm attractive to the external providers of ideas and innovation. Other factors, such as a firm's strategy and resource base, may also increase its attractiveness among external actors, even if there are no existing network ties. In addition, many network-based studies are conducted on a structural and aggregated level and thus have little to say about the micro-processes through which network connections arise and how firms within the network tend to interact (Dhanaraj & Parkhe 2006). In contrast, by distinguishing between attraction processes and search processes, the current study is focused on identifying and understanding new connections and the processes that underlie the establishment of these new connections. This last point also distinguishes this study from much of the alliance literature, as previous studies have focused on investigating how firms' *existing* alliances influence their innovativeness (Shan et al. 1994, Deeds & David 1996), whereas this study investigates the steps *prior to the establishment of an alliance*.

The focus of this study is hence more akin to the prior studies that have investigated how firms select alliance partners (Beckman et al. 2004, Baum et al. 2005, Li et al. 2008). However, the current study is also differentiated from this prior work, as it reverses the perspective and does not focus primarily on asking how firms select partners, but focuses instead on determining how firms are affected by *being selected as potential partners by external actors*.

In sum, these differences suggest that while the attraction-based approach adopted in this study shares certain key assumptions with previous innovation studies that outline the origins of innovation and the role of knowledge networks and alliances, the current study employs a different analytical scope and poses a partially divergent set of questions. Specifically, the current approach has a stronger process

### *Attraction: A new driver of learning and innovation*

perspective and is focused more on the inputs that firms receive from sources outside their existing networks and alliances.

#### **Absorptive capacity and attraction**

With respect to the challenge for firms of reaching beyond their own knowledge base and their existing networks, the concept of *absorptive capacity* has been highly influential (Cohen & Levinthal 1989). The premise of this perspective is that the ability to acquire external knowledge is limited by the firm's own experience and expertise, which means that in order to benefit from external knowledge, firms need to have certain *prior knowledge* in related areas that enables them to identify it, understand its value, and assimilate it (Cohen & Levinthal 1990, 1994). The implication of this argument with respect to overcoming the limitations of local search is that firms need to conduct R&D and develop knowledge within a broader range of areas than that for which the firm has immediate use, as this improves the firm's capacity to identify non-local, externally developed knowledge, and thereby its capacity to innovate and respond to opportunities or threats that may in the future emerge in areas outside of its own immediate environment (Zahra & George 2002).

For firms, absorptive capacity and attraction can be expected to be strongly *complementary*, in the sense that a firm that has high absorptive capacity will be particularly well equipped to evaluate, adopt, and benefit from the ideas and inventions that it attracts, whereas a firm that lacks absorptive capacity typically will reject the impulses it attracts, because it does not have the capabilities that are necessary to properly evaluate and adopt them and hence will likely fail to benefit from the ideas and inventions that it attracts.

However, although these characteristics can be highly complementary for firms, conceptual and definitional differences distinguish the attraction concept presented in this study from the well-known concept of absorptive capacity. Notably, whereas the literature about absorptive capacity emphasizes the importance of external knowledge for a firm's ability to innovate and identify new opportunities, it also maintains the assumption that the focal firm itself has to be able to identify the external knowledge. This literature hence has not taken into consideration the possibility that external knowledge may be attracted to the firm and that it thereby becomes exposed to the knowledge *without having identified it*. In contrast, this study suspends this assumption and focuses on the external knowledge to which

## Chapter 2

firms become exposed without having searched for it or even having itself identified it. In addition, whereas absorptive capacity represents *an internal organizational capability* that resides within a firm (Lane & Lubatkin 1998, Zahra & George 2002), attraction ultimately *resides in the perceptions (of the focal firm) held by external actors*, as it is ultimately the external actors surrounding the focal firm that determine whether they want to bring their ideas and inventions to the attention of the focal firm. In other words, a firm's absorptive capacity is its ability to identify and leverage potential combinations of its own knowledge and external knowledge, whereas a firm's attraction is constituted by its propensity *to trigger external actors to identify combinations between their own ideas and inventions and the firm's knowledge*, and to make them *inclined to approach the firm to present these combinatorial opportunities*.

In sum, this suggests that attraction and absorptive capacity are complementary concepts, and that the introduction of the attraction concept in this context can fill a gap that has not been addressed previously in the absorptive capacity literature, which in turn can help shed additional light on the underlying issue of how firms can avoid becoming myopic and trapped in overly local search.

### **Broadcast search and attraction**

Although the notion that a focal firm can reach beyond the scope of its own search as a result of external actors identifying ways in which their knowledge can aid the focal firm has not been addressed by the absorptive capacity literature, it has been touched upon in other studies. Specifically, the concept of *broadcast search* builds on this notion. Lakhani & Jeppesen (2010) describe how R&D-related problems that large firms such as P&G and Ely Lilly were unable to solve through internal innovation or external search may be solved by formulating the problem in a specific way and broadcasting it via the Internet to a diverse pool of scientists, researchers, and other thinkers with the promise that successful solutions will be acknowledged with a monetary reward.<sup>15</sup> The study shows that 30 percent of previously intractable problems could be solved through broadcast search.

This points to the fact that solutions to complicated problems often exist outside of the immediate context in which the problems

---

<sup>15</sup> Notably, this method has also been referred to as *crowdsourcing* (Brabham 2008).

have surfaced, and that the bounded rationality limitations that are manifested in local search behaviors may cause potentially tractable problems to remain unsolved because of an inability to match the right solutions to the problems (Hayek 1945, Cyert & March 1963, Lakhani 2006). However, as demonstrated by Jeppesen & Lakhani (2010), the process of making the problem visible to a broader and more diverse group than the firm would be able to reach through its own conventional search increases significantly the likelihood that the problem will be solved, which indicates that broadcast search represents a mechanism through which a firm can overcome the limitations of its own rationality and search processes (Lakhani 2006).

Importantly, however, broadcast search only encapsulates solutions to *pre-determined problems* that the focal firm deliberately makes visible, which suggests that broadcast search represents a subset of the broader class of processes in which a focal firm is helped by external actors *self-selecting* to approach the firm. In response to this limitation, this study seeks to extend the insights derived from the broadcast search studies by suspending the assumption that the focal firm has to broadcast a specific problem in order for external actors to self-select to approach the focal firm with ideas, inventions, and solutions. Instead, this study acknowledges that external actors may self-select to approach a focal firm to present their ideas, inventions, and solutions without being prompted by the broadcasting of a specific problem by the focal firm. In effect, it is suggested here that addressing this *unsolicited inflow of external impulses* represents an additional step away from conventional search procedures when compared to broadcast search.

In sum, it can hence be concluded that the concepts of broadcast search and attraction share the core assumption that it is the external actor that makes the connection and self-selects to approach the focal firm with an idea, invention, or solution to a problem, but that significant differences also exist. Notably, in broadcast search, it is still the focal firm that *initiates the process* and sets the boundaries for the type of contributions that it expects from the external actors, whereas in attraction, it is the external actor, and not the focal firm, that initiates the process and decides which type of ideas or inventions to present to the focal firm.

★ ★ ★

## Chapter 2

Finally, after having outlined the various mechanisms that can alleviate the problems associated with local search and myopia, and after having discussed how these problems relate to the attraction-based approach advocated in this study, in the following section an explicit *research gap* will be established and delineated based on the discussions of the previous sections. However, before this, I will briefly outline how the attraction concept relates to the increasingly popular concept of *open innovation*, since these have certain linkages that have not yet been discussed.

### Open innovation and attraction

The concept *open innovation* was popularized by Chesbrough (2003a,b) and refers to an approach to innovation whereby technologies and ideas originating outside the company are systematically integrated within firms' internal innovation, and where internal technologies are systematically sold and licensed in order to generate revenues (Vanhaverbeke 2006).

The literature about open innovation and the attraction-based approach of this study share a number of assumptions, namely, (i) that the use of external knowledge is a core process in innovation (Chesbrough 2006, Boudreau & Lakhani 2009), (ii) that valuable information, ideas, knowledge, and resources are widely distributed across different organizations (Kogut & Metiu 2001), and (iii) that the ideas and resources from which a given firm could benefit often are located outside the organization and thus need to be identified and accessed in order for the firm to be able to leverage them and transform them into actionable opportunities (Laursen & Salter 2006).

However, despite these common premises, *the concepts are distinctly divergent*. Whereas open innovation is a broad concept akin to an *innovation philosophy*, which emphasizes the use of external sources of innovation, attraction refers to a *specific mechanism* through which firm become exposed to external innovation, which is only one of several means by which external ideas and inventions can enter firms. This means that attraction can be *one component or element* of a firm's open innovation approach, but that the concepts refer to distinctly different phenomena. It also means that a firm can employ an open innovation approach *without* drawing heavily upon attraction, as it may rely on its own technology scouting procedures to identify external sources of innovation, and hence largely neglect the ideas and inventions that it attracts. In addition, it is worth not-

### *Attraction: A new driver of learning and innovation*

ing that attraction is not limited to firms that employ an open innovation approach; indeed, many firms that employ traditional closed approaches to innovation also attract ideas and inventions from the external environment.

Having emphasized the differences between open innovation and attraction as concepts, it is, however, also important to note that there are significant links and complementarities between them, in the sense that attraction can be expected to be particularly relevant in open innovation contexts, since having an open innovation approach tends to increase the value of the inflow of external ideas and inventions that a firm attracts, because the firm will be more likely to take advantage of these external impulses and to integrate them in its own innovation processes.

#### **2.4 A research gap: Attraction and the role of external initiatives**

As we can infer from the previous sections, the problem of how firms can avoid becoming overly reliant on their existing search routines and locked into their established knowledge structures, both tendencies that can potentially leave firms vulnerable to emerging threats and compel them to overlook valuable new opportunities, has been addressed at length in the literature. Three core themes of the previous work are: *internal diversity with respect to cognitions, technologies, practices, and norms* (Lyles & Schwenk 1992, Ahuja & Lampert 2001, Page 2007, Jonsson & Regnér 2009); *autonomous strategic initiatives* undertaken by entrepreneurial actors within the firm who are not as strictly bounded by the dominant ways of thinking and acting that are prevalent within the firm (Burgelman 1983a, Regnér 2003); and *access to external sources of knowledge and innovation* (Cohen & Levinthal 1990, Chesbrough 2003a, Jeppesen & Lakhani 2010).

Given these existing contributions, what new insights can the current study uncover and how does the approach used in this study relate to existing literature on the subject? As outlined in the previous sections, this study relates to these themes in several novel ways and seeks to extend the existing literature by addressing a previously overlooked aspect of these themes. The research gap that is targeted in this study is constituted by a pronounced lack of prior work addressing *strategic initiatives that originate outside of the focal firm and outside of its existing network of customers and suppliers*.



## Chapter 2

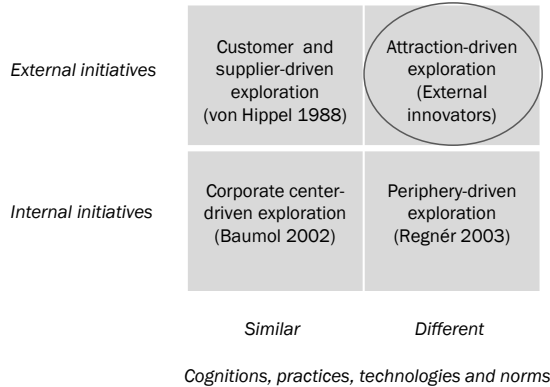
Existing work on exploration in general, and strategic initiatives in particular, has typically assumed that initiatives that compel a firm to enter a new market by developing a new type of product come primarily from *within* the firm itself, having been produced either via the regular innovation system or as the result of an autonomous initiative originating on the periphery of the organization (Burgelman 1983b, Regnér 2003), or possibly from *an existing customer or supplier* (von Hippel 1988). By broadening and expanding upon this assumption, this study extends this line of inquiry to also include a scenario in which someone from *outside of a focal firm and outside of its existing customer and supplier network* becomes attracted to that firm and approaches it with a strategic initiative.

By focusing on *external initiatives*, and specifically, on the inflow of externally generated ideas and inventions from outside a firm's existing customer and supplier networks, this study also relates to the other two themes discussed above, as this represents an additional mechanism through which firms gain access to *extramural* knowledge. Furthermore, as the external initiatives that originate from outside a firm's existing network of customers and suppliers tend to be based on cognitions, technologies, practices, and norms that partly diverge from those that dominate within the firm, there is reason to believe that these initiatives can constitute *a source of diversity* that supersedes the level of diversity that the firm can generate internally or receive from its existing customers and suppliers. This means that the conceptual approach taken in this study also directly addresses the need for variation and diversity in firms (Ashby 1956, Lyles & Schwenk 1992, Miller 1994, Page 2007).

The research gap that is targeted is illustrated graphically in Figure 2.2. The figure shows that whereas previous studies have outlined the various *internal drivers of exploration*, including both initiatives that originate at the center of the firm and which tend to be congruent with the firm's dominant cognitions, practices, technologies, and norms (Baumol 2002), and periphery-driven initiatives that tend to be driven by a different set of cognitions, practices, technologies, and norms (Regnér 2003), as well as *customer- and supplier-driven exploration* (von Hippel 1988), no prior studies have explicitly addressed *the exploration that is initiated by other types of external innovators*.

## Attraction: A new driver of learning and innovation

Figure 2.2 Research gap and empirical focus



In sum, this suggests that a study with an empirical focus on the external initiatives that firms attract from outside their existing customer and supplier network would address a previously under-researched area and potentially represent an extension of existing theories about the underlying mechanisms that drive firms' exploration processes, help firms to identify non-local opportunities, and prompt firms to respond to environmental changes in an appropriate and timely manner.

### 2.5 Conclusions and outlook for the empirical study

After having formulated the research gap that is targeted in this study and having reviewed and discussed a diverse set of concepts and studies in the previous sections, it can be concluded that whereas some of these ideas have commonalities with -- and sometimes strongly complement -- the attraction concept, the attraction concept still stands out as *distinctly different* from each of these existing concepts. Empirically, none of the previous studies reviewed in this chapter focus on external strategic initiatives and the unsolicited inflow of external ideas and inventions from outside of firms' existing networks of customers and suppliers. Likewise, on a conceptual level, none of the existing studies apply an attraction-based approach to

## Chapter 2

the identification of external ideas and inventions. Essentially, this supports the earlier conjecture that utilizing an attraction-based approach in the study of learning, innovation, and strategy creation indeed represents a potentially important research opportunity that can possibly shed new light on the conditions under which firms are able to move beyond local search and to identify and pursue novel, non-local opportunities.

However, this also points out that little empirical knowledge exists about the phenomenon as such, in the sense that we know little about the nature of external initiatives and the inflow of unsolicited external impulses that firms attract, and how these impulses affect the recipient firms. Further, this discussion underscores the fact that little conceptual work has been conducted based on attraction in this context. This lack of empirical antecedents and an existing theoretical framework raises specific challenges with respect to the current empirical inquiry, since there are no established research questions or firmly defined constructs around which the investigation can be structured. In response to this uncertainty, the empirical inquiry will be structured as *a two-stage study*, which will start with a *pilot study* that is intended to enable me to delineate the research questions and to provide direction about an appropriate research design for the subsequent *main study*. The pilot study and specified research questions are reported in the following chapter.

★ ★ ★

One issue, however, remains to be addressed before the empirical component of the study can be commenced. Having argued for the potential significance of the attraction of external ideas and inventions into firms, a question that might arise at this stage is why this phenomenon has not before been studied.

One reason why the phenomenon of attraction has not received more attention seems to be that external initiatives tend to be overlooked and downplayed for a number of reasons, making them particularly difficult to identify for researchers studying the origins of new products, technologies, and strategies in firms. I believe there is a strong case to be made for assuming that managers in firms will, to a large extent, either consciously or unconsciously, downplay the role of the attraction mechanism and, conversely, will exaggerate the agency of the decision-makers in the firm when explaining how a par-

*Attraction: A new driver of learning and innovation*

ticular opportunity was identified. First, actors in firms will tend to overlook attraction because the processes that bring resources and opportunities to a focal firm through the attraction mechanism are largely *invisible* to actors within the firm, since attraction builds on the search processes, sense-making, and opportunity recognition of other actors. Second, for managers to admit that valuable strategic opportunities have come about without the active agency of the firm can potentially reflect badly on them, because it can make them appear to have limited control and imply that they are failing to aggressively drive innovation and strategy development within the firm.

Furthermore, as soon as a firm has adopted a concept, idea, or initiative that was attracted to the firm from outside, internal actors will most likely be keen to take credit for its discovery and introduction. Therefore, *history will tend to be rewritten* in such a way that the agency of the managers in the recipient firm is emphasized at the expense of other actors' contributions. In sum, these factors will likely bias the attributions of how opportunities were created and identified in favor of explanations that involved the active agency of decision-makers in the recipient firms (Huber & Power 1985). As a consequence of managers' tendencies to downplay the role of attraction and external initiatives, I contend that there is reason to suspect that the lack of extant research on the subject of attraction does not necessarily reflect the significance of the topic, but may merely suggest that it has been overlooked in the past.

## Chapter 3

### Pilot study

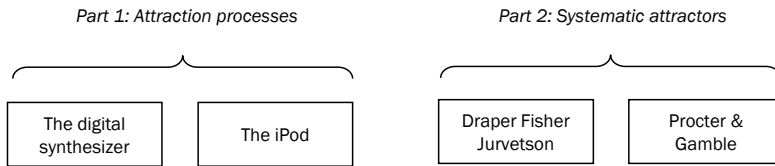
The pilot study that is described in this chapter was conducted with three primary aims in mind: (i) *to identify key aspects of attraction as an empirical phenomenon*, (ii) *to specify the research questions*, and (iii) *to establish the preliminary concepts that will be employed in the further study and analysis of attraction*. The pilot study is hence intended to move beyond the theoretical arguments made in the previous chapter and to create a preliminary understanding of how attraction plays out in real-world settings, and thereby to set the stage for further empirical studies.

Based on the exploratory nature of the study and due to the lack of prior conceptual or empirical work on attraction, a case study approach was selected as the means for investigating the phenomenon, in accordance with Eisenhardt's (1989a) recommendation to use case studies for exploratory theory-building. A case study approach seemed particularly appropriate, given that attraction represents a *complex real-world phenomenon over which the researcher has little control*, which is a typical situation when case studies are considered a valid method (Yin 1989). As is recommended in case study research, the case selection was based on *theoretical sampling*, which means that the cases were not randomly sampled, but rather, were selected on the basis of whether they were expected to provide the most significant insights into the phenomenon of interest (Eisenhardt & Graebner 2007, Siggelkow 2007).

### *Attraction: A new driver of learning and innovation*

As shown by Figure 3.1, the pilot study consists of two parts, and accordingly, two categories of cases were selected. The first category contains two salient examples of *attraction processes*. In other words, two innovation processes were studied in which an external idea or invention that had been introduced to the firm through attraction proved to be instrumental in the development of a new product or product category. The justification for studying this type of case was the previously mentioned ambition to move from theoretical arguments to studying concrete examples of how external ideas and inventions are attracted to established firms and how they can affect these firms. These examples of successful attraction processes also contribute to motivating the relevance of the study by constituting a form of an “existence proof” of the phenomenon and by showing that attraction is a salient factor in determining the success of some firms.

**Figure 3.1** Structure of the pilot study



The second case category consists of two companies that seek deliberately to leverage attraction by stimulating an inflow of external impulses. The main reason for selecting these cases was that while they are not typical firms with respect to attraction, they each provide, in accordance with the logic of theoretical sampling, excellent settings for learning more about the dynamics of attraction, since attraction processes are prevalent and visible in these settings. A second reason for studying such companies is that there is reason to believe, as discussed previously, that external influences on innovation processes in firms tend to be downplayed and forgotten over time as internal actors take credit for the ideas and innovation that an external actor initially brought to the firm. This bias in the accounts and perception of actors within the recipient firm can therefore lead to an underestimation of the prevalence and importance of attraction and the exter-

## Chapter 3

nal ideas and inventions that it brings to firms, which makes attraction processes difficult to study. However, by studying firms that seek deliberately to leverage attraction, this methodological problem can be ameliorated to a degree and the phenomenon of attraction can more easily be identified and studied.

★ ★ ★

After this short discussion of the principles and logic behind the design of the pilot studies, the subsequent sections will present two different parts of the pilot study. First, the methodology used in the case study process will be described in greater detail, with particular attention given to the sampling of the cases and the methods that were employed to collect and analyze the data. Second, each of the cases will be described and analyzed individually, followed by cross-case analyses of the respective cases. Finally, the findings of the study will be summarized and used to formulate the research questions that will guide the further empirical study.

### 3.1 Pilot study Part 1: Examples of attraction processes

As briefly explained above, the first part of the pilot study focuses on two examples of cases where an external actor approached the focal (case) company with an idea or invention that would subsequently play an important role in the development and commercialization of a new product or product category. The two cases are: (i) the iPod, a digital handheld music and media player, along with the digital media downloading service, the iTunes Store, both of which were launched by the American computer, software, and consumer electronics company Apple, Inc. in 2001 and 2003, respectively, and (ii) the DX7, the first commercially successful digital synthesizer, launched by the Japanese firm Yamaha in 1983.<sup>16</sup>

The two cases were selected on the basis that they are both well-known products that are considered to be salient examples of how the attraction of external impulses can play a key role in the devel-

---

<sup>16</sup> One of the cases is relatively recent, whereas the second dates back to the early 1980s. This is largely coincidental, but the older case of Yamaha and the DX7 illustrates the point that the attraction of ideas and innovations is not a new phenomenon, but rather is something that has happened historically, as well.

*Attraction: A new driver of learning and innovation*

opment of new products and ultimately may have a significant impact on the recipient firms' performance. Importantly, these cases represent success cases and hence should not be seen as typical examples of what happens when a firm attracts an idea or invention. While such sampling on success is in accordance with the received practice of theoretical sampling in case study research, this practice also imposes limits as to what type of knowledge can be inferred from the case studies. Given this sampling strategy, the study can provide examples of what characterizes such attraction processes in terms of how external ideas and inventions influence the recipient firms, and can also support the generation of preliminary concepts. However, the study cannot give any indication of the relative importance of attraction compared to other drivers of innovation and renewal in firms.

The case studies are based on a combination of primary and secondary data. Because the products are well known, there is a surfeit of material available about the creation of these products, making it possible to incorporate material from several different sources. In the case of both the iPod and the DX7, books have been written describing aspects of the development and release of the products. In addition, several interviews in the business press and in periodicals such as *Wired* and *The New York Times* with key people involved in the creation of the products proved to be important for understanding the processes. In addition to the secondary material, when possible, I conducted interviews with key personnel who were involved in these processes. In the Yamaha case, I interviewed the primary inventor behind the technology underlying the digital synthesizer, Professor John Chowning at Stanford University. I also interviewed Mr. Jon Sandelin, a representative of the Stanford Office of Technology Licensing, an organization that played a key role in establishing the connection between Yamaha and Professor Chowning.<sup>17</sup>

After having collected this material, I synthesized the data by writing a descriptive account of how events unfolded in the development of the products, according to the procedures for writing a narrative that were suggested by Pentland (1999). Based on this description, I then reinterpreted each case from an attraction-based perspective, identifying the findings that were related to attraction and then analyzing the role that the external idea or invention had played in the development of the new product (Langley 1999). Based

---

<sup>17</sup> For more information about the sources, see Appendix A.



## Chapter 3

on these results, the findings of the respective cases were then compared with one another, which in turn led to the development of a set of preliminary conclusions (Miles & Huberman 1994).

### 3.1.1 The creation of the digital synthesizer (DX7)

#### Introduction

The DX7, which would go on to become the first commercially successful digital synthesizer, was launched in 1983 by the Japanese musical instruments manufacturing firm Yamaha. The synthesizer represented a breakthrough in the development of digital music and catapulted Yamaha into a leading position in the burgeoning market for digital instruments. In total, approximately 200,000 DX7s were sold, vastly outpacing the sales of any of the competing products available at the time and making it the largest-selling single set of instruments in history.<sup>18</sup> Importantly, a technology known as *frequency modulation synthesis* (FM synthesis) played a pivotal role in the development of the DX7. FM synthesis was developed by Stanford professor John Chowning while he was a graduate student at the university. After Professor Chowning had made the discovery of the underlying scientific principle and developed rudimentary versions of the technology, it was presented to Yamaha by the Stanford Office of Technology Licensing and was ultimately licensed to Yamaha, where it would become the core technology used in the DX7. In the following section, I describe the process through which the DX7 came about and discuss the role that FM synthesis (and its inventor) played in the development of the DX7. Ultimately, the general insights that the case offers about the attraction of external ideas and inventions will be assessed.

#### Yamaha and electronic instruments<sup>19</sup>

The Yamaha Corporation was originally established in 1887 as a piano and organ manufacturer under the name of Nippon Gakki Company. By the 1960s, the company had emerged as the world's largest manufacturer of instruments, and since the late 1950s, it had engaged in a development project revolving around electric organs, which had resulted in the launch in 1962 of an electronic organ

---

<sup>18</sup> Johnstone (1999), pp. 236 and Nelson (2005), pp. 7.

<sup>19</sup> This section is based primarily on Johnstone (1999).

*Attraction: A new driver of learning and innovation*

called the D-1. While this product did not prove to be a commercial success, it still prompted the company to intensify its efforts within the sphere of electronic instruments in the mid 1960s, a time during which the “synthesizer,” a new type of electronic instrument, also began to appear in the market. The synthesizer was capable of producing a variety of sounds by generating and combining signals of different frequencies. The development of the synthesizer was driven by the invention of the transistor, which made it possible to build electronic music systems that were considerably smaller, cheaper, and more reliable than earlier systems. Early synthesizers were based on analog technology, and while innovative in the sense that they enabled the creation of new types of sounds and opened up new possibilities for composers and musicians, the products were still relatively expensive, difficult to handle, and suffered from reliability problems due to the limitations of analog technology, which tended to drive the synthesizers out of pitch and required frequent re-tunings.

By the early 1970s, Yamaha had not yet made a mark in the synthesizer market despite the company’s strong interest in this newly emerging product category. The reason for the firm’s late entry into this market segment was that Yamaha in 1966 had made a strategic decision not to develop any products based on analog technology, but rather had opted to build its synthesizers with digital technology. In theory, transforming analog waveforms into sequences of digital ones and zeros had distinct advantages, as it facilitated the control of the output of the instruments and enabled the automatic correction of errors (i.e., out-of-tune sounds). In practice, however, this process proved to be very difficult to achieve, especially since the development of a digital instrument required digital chips that possessed attributes and capabilities that existing suppliers were unable to deliver. The lack of market access to adequate chips triggered Yamaha to set up its own production facilities for semiconductors in 1971. At this time, Yamaha was pursuing different technological solutions in its quest to develop a synthesizer that would realize the inherent potential of digital technology. However, none of these alternatives had yet proven to be technologically satisfactory, and no commercial success had yet been achieved by the early 1970s. As such, Yamaha during this period was still searching for a solution that would allow the company to take advantage of the foreseen benefits of the new digital technology.

## Chapter 3

### John Chowning's discovery of frequency modulation synthesis<sup>20</sup>

In parallel with Yamaha's efforts to develop digital electronic instruments, interest in digital electronic music was also on the rise in other places. In 1962, John Chowning began work as a graduate student in the music department at Stanford University in California. He had prior training in music and was primarily interested in composing. However, before beginning his graduate studies, Chowning had traveled to Europe, where he became deeply interested in Europe's nascent electronic music scene. As a result, Chowning decided to pursue doctoral research in the area of electronic music. Notably, at this time, the music department faculty at Stanford possessed neither the experience nor the equipment necessary to compose electronic music. The university did, however, own a number of powerful mainframe computers, and although Chowning at the time had no knowledge of computers or computer programming, an article by Max Matthew in *Science* entitled "The Computer as an Instrument" inspired Chowning to start exploring the possibility of using computers as a tool for composing music, and he quickly realized that the prospect of programming computers to compose and play electronic music possessed significant advantages over existing analog methods.

At the University's Artificial Intelligence Laboratory, Chowning was given access to a mainframe computer that he used to hone his skills in programming and develop his understanding of the ways in which the computer could be used to produce sounds. In addition to the fact that it provided Chowning with access to the mainframe computer, an essential feature of the environment at the Artificial Intelligence Laboratory was that a diverse crowd of researchers from many different fields frequently gathered there to work and conduct research. This allowed for a free exchange of knowledge and ideas across different disciplines, which gave Chowning access to a pool of diverse knowledge originating in different scientific fields.

In the latter part of 1967, Chowning was at one point using the computer to experiment with exaggerated vibratos, a technique that was used to give electronic sounds a more realistic quality. While experimenting with these sounds, Chowning heard a tone that was not monotonous as expected, but rather, was rich in harmonics. At the

---

<sup>20</sup> This section is based on several sources, including Johnstone (1999), Nelson (2005), Lehrman (2005), and Darter (year unknown), as well as a one-on-one interview with Chowning himself that was conducted in 2007.

*Attraction: A new driver of learning and innovation*

time, creating harmonic tones with a computer usually required extensive programming, so Chowning recognized that what he had discovered could be a simpler solution -- a shortcut, as it were -- for creating harmonic tones electronically. Chowning later described the breakthrough as a “discovery of the ear” rather than a theoretical discovery, in the sense that he initially did not understand the physical principles behind this phenomenon. While recognizing that this might be significant, Chowning did not immediately dedicate his full attention to the discovery, and instead continued experimenting with this in parallel with other research projects. In 1970, discoveries made by other researchers in related areas prompted Chowning to intensify his efforts, as he realized that his method had definite advantages compared to other state-of-the-art methods for synthetically producing sounds. By this stage, he had also figured out that what he had discovered was something referred to as Frequency Modulation Synthesis (FM Synthesis), which had been described and had applications in other areas, such as broadcast radio.

As Chowning’s intensified schedule of experimentation led to several breakthroughs, including realistic simulations of brass instruments, he decided to contact the director of the newly formed Office of Technology Licensing (OTL) at Stanford University, Neils Reimers, in order to investigate the commercial potential of his discovery. Reimers approached the obvious candidates, e.g., the major domestic organ manufacturers, including market leader Hammond. Most of the companies sent engineers to evaluate the technique, but none of them showed any real interest in licensing it. John Chowning explains that because of their background in analog technology, these engineers tended to fail to understand how the discovery could be fully taken advantage of:

“...none of the engineers understood anything about the digital domain, so they couldn’t wrap their minds around this idea of digital signal generation, so that was the problem in those years – representatives that came to evaluate the sounds -- the technology, based upon the quality of the sound -- were all very impressed, but it was seemingly impossible to get them to understand that this was a computer program that could be implemented eventually in some digital circuitry, like special purposes computers, that would allow instruments to be built.”<sup>21</sup>

---

<sup>21</sup> Chowning (2007).

## Chapter 3

### The creation of the DX7

As a last resort, the OTL contacted Yamaha, which, as discussed previously, was the leading instrument manufacturer in the world at the time and which had also recently started to develop electronic instruments. Despite its size, Yamaha had very limited market penetration in the U.S., which was an important reason why OTL had initially overlooked Yamaha. At the time that Yamaha was being approached by the OTL, one of its engineers, Ishimura Kazukiyo, happened to be in California for a meeting. Returning from that engagement, he agreed to meet with John Chowning and Neils Reimers. Chowning explained his discovery and played several sound samples that he had created using FM synthesis. Ishimura immediately understood both the concept and the potential significance of the discovery. The primary reason for his ability to rapidly comprehend FM synthesis was that Yamaha, as mentioned previously, was at the time already exploring digital technology in relation to the development of electronic instruments. Ishimura enthusiastically reported back to Mochida Yasunori, the head of R&D at Yamaha, about the potential of the licensing opportunity. In retrospect, Mochida Yasunori, former Head of R&D at Yamaha, states that:

“As an engineer, you are lucky if you ever encounter a simple and elegant solution to a complex problem. FM was such a solution, and it captured my imagination. The problems of implementing it were immense, but it was such a wonderful idea that I knew in my heart that it would work eventually.”<sup>22</sup>

One of the reasons for his enthusiasm was that FM synthesis was computationally efficient and required little memory, which at the time was an expensive commodity. Furthermore, FM synthesis offered a number of musical advantages, in the sense that it made the simulation of natural tones easier compared to the alternative solutions that were feasible at the time. Based on his appreciation of the solution, Yamaha engaged in projects aimed at evaluating the solution more closely, and several of these experiments produced favorable results. The patent on Chowning’s discovery was granted in 1975 and subsequent to that, the final licensing agreement between OTL and Yamaha was signed.

---

<sup>22</sup> Johnstone (1999), pp. 235.

*Attraction: A new driver of learning and innovation*

By this point, John Chowning had essentially proven how FM synthesis could be used to produce sounds that were harmonic, and in addition, he had developed a range of algorithms that could be run on mainframe computers to aid in the composition process. However, FM synthesis was not yet a feasible technology, as there were not any hardware components associated with it. Therefore, the challenge facing Yamaha was to translate the algorithms and principles into an actual technology with hardware components, which ultimately could be developed into an instrument such as a synthesizer. As anticipated by Mochida Yasunori, head of R&D at Yamaha, the technological implementation of FM synthesis and its translation into a commercial product proved to be an enormous R&D undertaking. A number of engineers, each with different areas of expertise, were assigned to the effort, and more development resources were gradually devoted to the implementation of FM synthesis by Yamaha. During the latter part of the 1970s, this technology came to be given priority over alternative solutions in the development of digital electronic instruments.

Throughout the development process, John Chowning visited the R&D department of Yamaha as a consultant. Typically, he would spend a week at the Yamaha facility every six months, during which the teams would work together and Chowning would give his input on the way they had transformed the algorithms that he had developed into technology and hardware. In this process, Chowning contributed not only his knowledge of FM synthesis as such, but also other qualities that to some extent complemented the Yamaha team's superior engineering capabilities. Chowning explains that he did not perceive the synthesizer that they were developing as a commercial product, but rather as an instrument that had to meet his musical standards in terms of sound quality and richness, and that his perspective as a musician may have played a role in developing the musical qualities that would characterize the DX7. In Chowning's words:

"My interest was making music, and getting these sounds right was important to me, so my motivation was high. If you can imagine that kind of passion -- an artistic interest compared to an engineer who is doing it for eight hours a day and doesn't care so much -- the results are always going to be different."<sup>23</sup>

---

<sup>23</sup> Chowning (2007).

### Chapter 3

#### The launch of the DX7 and the long-term impact of FM synthesis

The first commercial product that came out of this cooperative arrangement was a digital synthesizer called the GS1. Launched in 1978, it was considered to be a fine instrument, but it was marketed at a price of US\$20,000, making it prohibitively expensive for virtually all users, with the possible exception of highly paid professional musicians. Commercial success did not arrive until a mass-market version of the instrument, the DX7, was released in 1983. The DX7 initially sold for approximately US\$2000, which appealed to a much broader audience than previously available, albeit more expensive, synthesizers. The demand for the DX7 vastly exceeded both Yamaha's expectations and their production capacity, resulting in extensive backlogs. The wildly successful launch of the DX7 drove many of the competing synthesizer companies out of business and marginalized most of the surviving competitors.<sup>24</sup> In addition to the DX7, Yamaha also leveraged its massive investment in FM synthesis technology across its entire product range, from small portable keyboards to high-end, state-of-the-art electronic organs.

The R&D that had been conducted based on the FM synthesis concept while developing the synthesizer also opened up other markets for Yamaha. As mentioned previously, Yamaha decided early on to manufacture its own chips. The key component of the DX7 was the FM chip, which was the concrete result of Yamaha's intensive and lengthy efforts to translate the basic principle behind FM synthesis into tangible technologies. The FM chip represented a state-of-the-art technology whose use was not restricted to digital synthesizers. The early success and the proven superiority of the FM chip led Mochida Yasunori, head of R&D at Yamaha, to believe that the chips could provide Yamaha with the basis for developing a personal computer. However, this ultimately proved to be a faulty assumption, and Yamaha was forced to abandon this effort. Instead of entering the computer sphere, Yamaha managed to start a successful chip business. In the years to come, FM chips became a *de facto* standard for *computer sound boards*, which remained a viable business for Yamaha well into the 1990s.<sup>25</sup>

---

<sup>24</sup> Notably, the launch of the digital synthesizers also made the demand for electric organs virtually disappear; as a result, several of the electric organ manufacturers that had failed to grasp the concept of FM synthesis rapidly went out of business.

<sup>25</sup> Johnstone (1999).

**Findings and implications: The creation of a core competency in digital music**

In sum, the case description points to the significant role that the external impulse from Professor Chowning and the Stanford Office of Technology Licensing played in Yamaha's development of the digital synthesizer. In addition, the case offers a number of more general findings, which have significant implications for the study of attraction as a phenomenon.

Fundamentally, the case represents an example of a process wherein an external impulse constituted the *seeds of the development of a new core technology and a new core competency* (Prahalad & Hamel 1990). Specifically, the case description shows that FM synthesis, along with the input provided by John Chowning throughout the process of developing the DX7, fundamentally shaped the technological trajectory upon which Yamaha embarked (Dosi 1982, Patel & Pavitt 1997). The case further demonstrates that FM synthesis became a core technology and a stepping stone in Yamaha's development of a core competency in digital music that would undergird the development of a long line of digital synthesizers and other electronic instruments, as well as growth into other product categories, including Yamaha's successful chip business for computer sound boards and its ultimately unsuccessful venture into personal computers (Penrose 1959, Danneels 2007).

In addition to the description of how FM synthesis and John Chowning's further work contributed to the development of a core competency within Yamaha, this case also provides insights into the fundamental question of why attracting external impulses can be valuable to established firms despite the fact that they devote significant resources to internal R&D and to scanning external environments for new innovations. Therefore, the case analysis revolves around the questions of (i) why Yamaha had not itself been able to develop a solution as elegant and cost-effective as FM synthesis, given that Yamaha at the time was a leading instrument manufacturer that had already made substantial investments in developing a digital synthesizers, and (ii) why it was Chowning and the Stanford Office of Technology Licensing that found Yamaha and not the other way around, given that Yamaha was actively scouting for new technological solutions in this area.



## Chapter 3

### Why was Yamaha's search insufficient?

The case analysis suggests that an answer to these questions lies in *the combinatorial and cross-disciplinary ability* that was required in order to develop a digital synthesizer based on FM synthesis, and in *the way the requisite knowledge was distributed and structured* at the time. In short, the study shows that the development of the DX7 required *a broad range of knowledge and competencies from several different disciplines*, not all of which existed within Yamaha or could easily be developed within the company. In addition, at this early stage, the relevant knowledge in the field of digital music was structured in such a way as to make it more difficult for Yamaha to search and acquire the requisite knowledge and solutions externally (cf. Hayek 1945, Moran & Ghoshal 1999, Becker 2001).

The creation of the DX7 was characterized by complex combinations of a number of seemingly distant fields, including computer science (programming), integrated circuits (chips), musical instruments, and psycho-acoustics, which is a discipline concerned with the way the human auditory systems works and how sounds are perceived by the human ear and brain. In the early 1970s, Yamaha possessed some of the elements necessary to engage in this research, such as the computing skills and general knowledge about instruments, but lacked others. The lack of certain types of knowledge would in itself not have been critical if they could have been easily acquired externally. The problem from Yamaha's perspective seems to have been that some of the required disciplines, particularly psycho-acoustics, were alien to the engineers and scientists at Yamaha and, in fact, so distant from the existing knowledge base of Yamaha's team that they essentially *did not know what they were missing*.

In relation to this finding that certain necessary components were alien to the personnel at Yamaha, the case study suggests that Chowning's background and identity as a musician in certain ways complemented Yamaha's R&D processes, which were driven exclusively by engineers, rather than by musicians. Chowning explains that:

"I was a musician. All my training was in music, and I was talking about something that had deep technological implications for them. I think [...] we have to involve more than the technological aspects of this in order to make good use of it – having good ears, critical listening, and understanding of what the perceptual mechanism expects. The evolution of the audi-

### *Attraction: A new driver of learning and innovation*

tory system is based upon things like source segregation and source identification, which I was trying to separate out so that I could implement them in the digital synthesizer.”<sup>26</sup>

As such, the act of introducing the perspective of a musician proved to be a new channel for improving the sound quality of the digital synthesizer, as it ensured that perceptual auditory mechanisms were being taken into account and that insights from the discipline of psycho-acoustics became an integral part of the development process. This suggests that Chowning’s background as a musician and his personal motivation to create an impressive instrument with high sound quality was critical to his ability to help create a synthesizer with superior sound quality compared to earlier versions, an outcome which, along with the model’s comparatively low price, contributed to making the DX7 a massive sales success.

In addition to the fact that Yamaha lacked certain elements that would later prove essential in the design of the DX7, the case study suggests that there was also a culturally influenced reluctance to step across disciplinary boundaries, which made it more difficult to integrate knowledge from different sources. Chowning explains that:

“They were good – extremely good – they had good programmers. So they were up-to-date as to programming. But there was an attitudinal difference towards research, maybe not as open as the attitude towards research in our universities. It was in some cases acknowledged by the Yamaha engineers that it was hard for them to think the way I think about these things; to relate it all to how the ear works, psycho-acoustics, and disciplines which are far afield, all of which were incredibly important to me because that was where I was getting an understanding of how the perceptual mechanisms worked, which was how I made good use of the technology. But the idea that an engineer should understand something about an aspect of knowledge that was quite deeply rooted in an unfamiliar discipline such as psychology, perception, and psycho-acoustics was kind of foreign to them. So, maybe there was a cultural difference – they were more compartmentalized as far as research interests. I’m computer guy and that’s what I do and that’s the hardware guy and that’s what he does.”<sup>27</sup>

---

<sup>26</sup> Chowning (2007).

<sup>27</sup> *Ibid.*

### Chapter 3

This statement indicates that what John Chowning brought to Yamaha was not merely the algorithms behind FM synthesis, but also a *cross-disciplinary mindset* that he had cultivated at Stanford University, and which proved to be instrumental in developing the emerging field of digital music. By including Chowning in the process of refining FM synthesis and in the development of the digital synthesizer, Yamaha was able to draw upon knowledge bases and perspectives that were foreign to them but were critical for the development of the digital synthesizer.

Altogether, the previous discussion suggests that Chowning introduced a number of components that were complementary to Yamaha's internal skills in programming, engineering, and the design of integrated circuits. First, he introduced *the invention itself*, including the algorithms behind FM synthesis, which in turn became the basis for the development. Second, Chowning brought the discipline of *psycho-acoustics* into the process, which was largely unknown to the engineers at Yamaha, and when originally introduced to them, was perceived as being largely irrelevant. Third, he brought *a different set of cognitions and cultural norms* about how research should be conducted. Whereas Yamaha was largely characterized by a compartmentalized engineering culture in which each person focused primarily upon a particular subset of problems within a specific field, Chowning had been trained at Stanford University and had been influenced by the atmosphere at the eclectic Artificial Intelligence Laboratory, where researchers from all fields gathered and exchanged information, ideas, and experiences. This allowed him to draw upon a more diverse pool of knowledge, as well as to introduce this more cross-disciplinary and combinatorial approach to research to the developers and researchers at Yamaha. Fourth, Chowning's *personal identity as a musician and composer* granted him a deep artistic and aesthetic understanding of what was required of a digital instrument in order for it to be accepted by future users.

Identifying these elements that Chowning contributed to the development process also seems to make it easier to understand why Yamaha was not able to find and identify these knowledge components through their own search processes. A number of factors seem to have made Yamaha's hypothetical search for these components difficult and problematic. First, digital music was at the time *not an established field of research or an established business area*. As such, there were *no institutionalized structures for producing knowledge*

### *Attraction: A new driver of learning and innovation*

*within this area*, i.e., there were no institutes, no university departments, and no research companies dedicated to systematic investigation within this field. In addition, the existing industry for synthesizers was, from Yamaha's perspective, not a fruitful place to search for solutions, since existing firms were on a different technological trajectory, building on analog solutions. The lack of such structures made Yamaha's search more difficult, since it was difficult under such conditions for Yamaha *to know where to look*, and often even harder *to discern exactly what the company should be looking for*. The FM synthesis concept also appeared in an unlikely place, in the sense that the Stanford music department was a traditional music department with no connection to technology or electronic music prior to Chowning's arrival. Indeed, Chowning himself comes across as an unlikely inventor, since his primary area of interest prior to the period in question centered on music and composing, rather than science, technology, and inventing.

To some extent, as can be inferred from the case description, this was also problematic for Chowning and the Stanford Office of Technology Licensing (OTL), as they were trying to find a company that could put FM synthesis to commercial use. Because digital music was still not a developed field led by a set of established companies, OTL initially approached the wrong companies. However, the search process eventually was facilitated by the fact that several large, established manufacturers of electronic instruments existed that were *visible and relatively easy to identify*, and in the end, one of these firms, Yamaha, proved to be acutely interested in FM synthesis.

### **Conclusions**

Taken together, all of this suggests that Yamaha's attempts to find technological solutions that could solve the challenges inherent in creating digital music and developing digital instruments were impeded by the fact that digital music was still *a new and highly unstructured field* at the time, a field in which it was difficult to know where valuable knowledge was being created and what the most likely sources of potential breakthroughs would be. This, in turn, rendered it difficult for Yamaha to identify the relevant external knowledge and resources through its own search activities, since the firm essentially *did not know what it was lacking*. However, the company's visibility and reputation for producing electronic instruments made it an attractive target for the search activities of external actors such as the

## Chapter 3

Stanford Office of Technology Licensing, which ultimately gave Yamaha access to FM synthesis and the other elements provided by Chowning, which were largely complementary to Yamaha's existing capabilities and knowledge base and which ultimately proved to be essential to the innovation process.

★ ★ ★

These findings and implications will be further discussed in a subsequent section, in which they will be compared to the findings of the other pilot case studies. In the next section, the case study of Apple and its creation of the handheld media player, the iPod, will be described and analyzed.

### 3.1.2 The creation of the iPod and the iTunes Store

#### Introduction

The iPod is a brand of portable music and media players designed and marketed by the California-based computer and consumer electronics company Apple, Inc. The first model of the iPod was launched in October 2001, and since that time, a number of models of different sizes and with different functions have been released. By the end of 2008, over 178 million units had been sold and the iPod had come to dominate the market for portable music players with a 70 percent market share.<sup>28</sup> An iPod is typically used in conjunction with iTunes, which is a digital media player application originally introduced by Apple in 2001, as well as with the iTunes Store, introduced by Apple in 2003, a website through which consumers can purchase digital music (and other media products). The combination of the handheld device (iPod) and the music distribution system (iTunes Store) represents a new business model that has simultaneously transformed the music industry and renewed Apple's product portfolio and corporate strategy.<sup>29</sup> The development of the iPod and iTunes was in-

---

<sup>28</sup> Elmer-Devitt (2008).

<sup>29</sup> In terms of the impact of this new business model, in 2008, the combined sales of the iPod and iTunes accounted to 12 493 million dollars, which represented 40 percent of Apple's total sales. By January 2008, Apple had sold over 5 billion songs through iTunes and was the global leader both in terms of digital handheld music players and legally downloaded digital music (Apple 2008a,b).

initiated in part by an external entrepreneur, Tony Fadell, who early on envisioned Apple's transformation into a supplier of digital music. He presented this idea to Apple's management in 2001 and was hired to contribute to the realization of this vision. In this case study, I describe and analyze these processes with a specific focus on the role that the idea provided by Tony Fadell played in the development of the new business model.

### **Apple and the emergence of the digital music industry**

After a long period of decline that stretched throughout the 1990s, Apple launched a successful new line of computers called iMacs in the early 2000s. The sales of the iMac brought Apple back to a state of profitability after a number of years that had been marked by financial losses. However, despite the success of the new iMac, Apple remained a niche player in the market for personal computers, with only a four percent to five percent market share, which prompted many observers, including Apple CEO Steve Jobs, to conclude that Apple's long-term position was vulnerable. In a 2007 McKinsey Quarterly interview, UCLA Professor Dick Rumelt explains that during the course of a conversation in the late 1990s, Steve Jobs told him that his then-current strategy was to "wait for the next big thing" and then to aggressively go after it.<sup>30</sup> At this time, Apple had dabbled in several new product areas, but none of them had yet proven to be the vaunted "next big thing."

A development that was attracting attention at this time was the digitization of music, which enabled it to be replicated and distributed over the Internet at a marginal cost close to zero. Many music consumers were taking advantage of this by downloading digital music from websites such as the online music file-sharing service Napster, whose technology allowed users to copy and distribute MP3 music files easily.<sup>31</sup> However, because this service bypassed the established market for music and did not distribute copyright royalties to the artists and record companies, Napster quickly encountered accusations of copyright violations.<sup>32</sup> Although the original Napster service was shut down by court order, it paved the way for decentralized peer-to-peer file-distribution programs, including services such as

---

<sup>30</sup> McKinsey Quarterly (2007).

<sup>31</sup> Menn (2003).

<sup>32</sup> Evangelista (2002).

### Chapter 3

Kazaa, which proved to be much harder to control. While hugely successful in terms of overall usage, these digital music distribution networks continued to face legal problems. At the same time, record companies and other actors within the traditional music industry were reluctant to take advantage of the new technological possibilities and were therefore unable to offer competitive legal alternatives to the illegal downloads available through the file-sharing networks.

This lack of ambition among the incumbents of the music industry to develop new business models and distribution channels in response to the disruptive changes in the industry, in combination with the legal troubles faced by Napster and other file-sharing networks, suggested that there was an opportunity for an actor who was able and willing to develop a new, legal business model that took advantage of the possibilities associated with the online distribution of digital music. In response to these developments, Apple had, under the leadership of Steve Jobs, started to look into the music business. In 2000, Apple acquired the digital music player application SoundJam MP from the smaller firm Casady & Green, and subsequently hired that company's entire team of programmers. SoundJam MP was given a new user interface and was then released in January 2001 as iTunes, an application used for playing and organizing digital music and video files.<sup>33</sup>

#### **Tony Fadell's vision of a new product and a new business model**

In parallel with Apple's attempts to enter the music industry, computer engineer Tony Fadell had developed an idea for commercially exploiting the digitization of music. Fadell had a longtime interest in digital music and handheld audio devices, which he had developed throughout his career. First, he worked for General Magic, originally a spinout from Apple, which was a pioneer in the type of handheld devices that would later be known as Personal Digital Assistants (PDAs). In 1995, Fadell moved to Philips, where he eventually became Vice President of Business Development at the Philip's U.S. Consumer Electronics, Strategy, and Ventures unit, and where he was responsible for Philip's Internet and digital audio strategy. In 1999, Fadell opted to start his own company, called Fuse, with the aim of developing it into the "Dell of the Consumer Electronics."<sup>34</sup> One of the

---

<sup>33</sup> Kahney (2006).

<sup>34</sup> Markoff (2004).

### *Attraction: A new driver of learning and innovation*

devices he had in mind was a small, hard disk-based music player. As a first step, he managed to raise a million dollars from so-called angel investors in November 1999. However, the initial investment proved to be insufficient to develop the idea into a product, and as a result of Fadell's failure in 2000 to raise a second round of financing, the company was discontinued later the same year.

Lacking the funds to pursue his ideas independently, Fadell began to look for ways of realizing the idea under the auspices of an existing company. By this time, his idea had evolved from merely a handheld music player device to a more complete business model. Ben Knauss, former senior manager at PortalPlayer, who as the primary liaison in the later cooperation between Apple and PortalPlayer would become closely involved in the initial phases of the development of the iPod, states:

“Tony’s idea was to take an MP3 player, build a Napster music sales service to complement it, and build a company around it.”<sup>35</sup>

Fadell first presented his idea to the company RealNetworks, which specialized in digital audio broadcasting over the Internet. RealNetworks initially responded positively to his idea and offered Fadell a staff position. However, the company was already in control of a large content delivery system through RealNetworks’ premium radio and television channels. As such, RealNetworks could not rationalize going through the trouble of releasing an accessory to their already-profitable system. As a result, Fadell did not get the support he had hoped for and left the company after only six weeks. Instead, in late 2000, he pitched his idea to Apple, unaware that the company had acquired SoundJam MP just months before.<sup>36</sup>

#### **Combining Fadell’s idea with Apple’s existing capabilities**

Fadell’s idea was well received by Apple’s top management, and particularly by CEO Steve Jobs. At this time, there were a number of portable MP3 music players on the market, but all of them were beset by different flaws and deficiencies. The designs of the players were generally unappealing, the menus and interfaces were complicated, and battery duration times were short-lived. As the Apple team eva-

---

<sup>35</sup> Kahney (2004).

<sup>36</sup> Hormby & Knight (2005).



### Chapter 3

luated these existing products, they were generally unimpressed and believed that there was an opportunity for Apple to combine Fadell's idea with Apple's specific competence in designing consumer products that are appealing both from an aesthetic and a functional perspective. Steve Jobs assigned the task of further developing the idea to Apple veteran Jon Rubinstein, who called Tony Fadell and invited him over to Apple, where he was offered a position leading a small team of engineers and designers with the objective of rapidly designing and putting together the device. The team was handpicked and set up outside of the regular computer business in order not to disturb the development of new computer models. Ben Knauss, former senior manager at PortalPlayer, remembers that Fadell had already at this point developed his own strong vision of the project he would be working on. In early 2001, Fadell predicted that:

“This is the project that is going to remold Apple, and 10 years from now it's going to be a music business, not a computer business.” (Ben Knauss, Former Senior Manager at PortalPlayer)<sup>37</sup>

From this point in early 2001, an intensive development and design effort was carried out. In response to the very tight timeline that had been established by Steve Jobs, Rubenstein and Fadell, who were in charge of the development of the new device, decided to combine the use of external suppliers and “off-the-shelf components” with Apple's in-house expertise.<sup>38</sup> Throughout the course of the project, Steve Jobs assumed a very active role, scheduling frequent meetings with the directors from Fadell's group and PortalPlayer. During these meetings, Jobs would detail the concerns he had about the device, whether having to do with the interface, the sound quality, or the size of the scroll wheel.<sup>39</sup>

Aided by Jobs' keen sense of how technology should be designed, the development and design team led by Rubinstein and Fadell were able to finish the first version of the product within six months. On

---

<sup>37</sup> Kahney (2004).

<sup>38</sup> This included a drive from Toshiba, a battery from Sony, and control chips from Texas Instruments. Additionally, Fadell was not confident that Apple would fund the development of custom hardware and software for the player, so he shopped around for an existing player to use as the basis of the Apple player, which led the team to PortalPlayer, a new company that had not yet released a full product, whose solution Apple would ultimately elect to use (Kahney 2006).

<sup>39</sup> Hormby & Knight (2005).

### *Attraction: A new driver of learning and innovation*

October 23, 2001, Steve Jobs presented the new device to the public using the appellation “iPod.”

#### **The impact on Apple and the digital music industry**

A major driver of the iPod’s sales was the launch of the companion digital music store iTunes Store in 2003, which rapidly became the leading online provider of digital music. In accordance with Fadell’s initial vision of developing a MP3 player and building a Napster-like download service around it, this approach also transformed the iPod from a largely stand-alone product into a key component of a new business model in the music industry, wherein consumers would buy both the audio device (e.g., the iPod) and the digital music from Apple. The combination of the iPod and the download service known as the iTunes Store into an integrated business system catapulted Apple into the position of becoming the leading company in the digital music industry and the leading music retailer in the U.S.<sup>40</sup> As of 2008, the sales of iPods and digital music through the iTunes Store represented 40 percent of Apple’s total revenues, which shows that the development that was initiated in 2001 has triggered a major shift in Apple’s corporate strategy by transforming what was once solely a computer company into a digital media company.

#### **Findings and implications: Sowing a seed within an established firm**

In sum, the case description illustrates how the impulse brought to Apple by Tony Fadell was combined with Apple’s existing resources and capabilities in such a way that the iPod and the iTunes Store could be developed, which together created a new business model that ultimately established Apple as a leading player in the digital music industry.

In terms of the nature of the attraction process, the creation of the iPod represents an example of how an externally generated idea was combined with the resources and capabilities of an established firm (Alvarez & Barney 2001, Street & Cameron 2007). The case description shows how Fadell’s vision of a new business model for the distribution of digital music, based on the combination of a handheld digital music player and a music downloading service, was *combined with Apple’s existing competencies* in product development, design, and, ultimately, consumer marketing. Further, it is demonstrated

---

<sup>40</sup> Apple (2008).

### Chapter 3

that the presentation of the idea to Apple's management triggered an *extension of the use of the company's existing resources and capabilities into a new product area* (Danneels 2002). Importantly, these resources and capabilities proved to be somewhat *fungible* in the sense that they could be successfully employed to design and develop the iPod and the iTunes Store (Danneels 2007). As such, this case can be conceptualized as an example of how an externally developed *idea sowed a seed within an established firm*, and thereby *rejuvenated its resource base* by putting it to novel and value-creating uses in a new product market (Penrose 1959).

In terms of the impact of the external idea, the case description suggests that it had far-reaching consequences, as it compelled the company to explore a new industry, which constituted a *radical re-orientation of Apple's corporate strategy* (Burgelman 1991, Regnér 2003). In effect, the development of the iPod transformed Apple from being a company focused primarily on computers to one that earned a substantial share of its revenues from products and services related to digital music. While pointing to the radical renewal of Apple's corporate strategy, which began in conjunction with Fadell's presentation of his idea to Apple, it is also important to note that there is no way of knowing whether this expansion into the digital music sphere would have taken place regardless of Fadell's contributions, since the company had already started to look into digital music before Fadell approached the company. However, the chronology of events suggests that Fadell's idea was an *important catalyst* in this process, triggering the initiation of the effort to create a digital music player and the subsequent link to the downloading service, iTunes Store.<sup>41</sup>

#### Why was Apple's search insufficient?

As argued in a previous section, in order to learn more about attraction and the role that the inflow of external ideas and inventions plays in established companies, it is essential, in conjunction with each specific attraction process, to ask why the external impulse was valuable to the recipient firm, and why the firm itself could not identify the opportunity. In this case, the answer seems to be related to both *capabilities and cognitions* (Prahalad & Bettis 1986, Prahalad &

---

<sup>41</sup> This conclusion that Fadell's vision played an important role is also supported by the substantial ownership stake through stock and options that Fadell was awarded in conjunction to the development of the iPod (See Coff 2009).

*Attraction: A new driver of learning and innovation*

Hamel 1990, Tripsas & Gavetti 2000). The case description suggests that Fadell's unique background in developing handheld devices at Phillips and Fuse had led him to develop a set of capabilities and cognitions that differed from Apple's own core capabilities and dominant logic, both of which had been shaped by the company's history as *a computer company*. The case further indicates that this idiosyncratic set of capabilities and cognitions had put Fadell in a relatively more favorable position to identify new opportunities related to digital music and handheld digital devices, which allowed him to envision a new business model for Apple based on the combination of a handheld device and a proprietary downloading service that could not as easily have been discerned from within Apple, given its history and identity as a computer company.

In addition, the case suggests that Fadell's *role as an outsider* enabled him to more readily envision radical changes in Apple's future corporate strategy, in the sense that his *lack of socialization* within Apple's organizational culture and his lack of exposure to the dominant logic within the company rendered him less restricted by Apple's current strategy and identity as a computer company (Prahalad & Bettis 1986, Edman 2009). In effect, having fewer ingrained ideas about what kind of a company Apple was (and was not) seems to have helped Fadell to formulate the vision of transforming Apple into a music business.

As such, this indicates that the value of attracting external ideas and inventions lies not only in the ability of these processes to bring external knowledge and capabilities into the organization, but also in the access they grant to *the fresh perspectives of outsiders on the firm and its future potential for strategic development and growth into new product areas*, which potentially may encompass more radical departures from the current corporate strategy compared to what could be envisioned by those within the firm.

More generally, this observation raises the possibility that whereas actors within a focal firm have an advantage in identifying opportunities related to *the firm's existing uses of resources and capabilities*, external actors have a relative advantage with respect to the identification of opportunities to put the resources and capabilities of the focal firm to *completely new uses* related to product areas within which the focal firm has no existing presence, thanks to their above-mentioned lack of socialization inside the focal company and exposure to its dominant logics (cf. Danneels 2007). This argument

### Chapter 3

would suggest that it was no coincidence that Fadell made his contribution in an area that was new to Apple, and not within the sphere of Apple's existing personal computer business, as it can be expected that Apple was well informed about possible opportunities within the personal computer industry and hence had already picked "the low-hanging fruit" in this area (cf. Denrell et al. 2003).

In addition to these explanations related to *differences in perspectives* that can be attributed to the divergent capabilities and cognitions of Fadell and Apple, the case findings also suggest that the nature of *the company's strategic context* at the time could help to explain why Apple had not already identified the opportunity. Notably, the strategic context was characterized by *a high degree of complexity*, in the sense that both Apple's specific strategic situation and the general situation of the emerging digital music industry were subject to considerable *turbulence, uncertainty and unpredictability* (Lane & Maxfield 1996, Mosakowski 1997, Regnér 2001). This complexity and turbulence seem to have made it difficult for Apple *to attain a complete overview of the opportunity space upon which the company potentially could draw*. As a result, there was room for Fadell to identify opportunities involving Apple that had not been perceived from within the company, which may not have been the case if the market environment had been more stable and predictable, a situation which would have increased Apple's chances of developing a more complete overview of the opportunity space that the company faced.

#### Timing

A further finding of the study pertains to the role of timing in impacting the probability that an external impulse will be taken advantage of by the recipient firm. In this case, by the time that Fadell approached Apple, the company had already taken its first probing steps towards the music industry by acquiring certain resources in the form of the music player application SoundJam MP, which would later be used to develop iTunes and the iTunes Store. However, the company was still in *an early exploratory phase* and had not yet developed any commercial products or services within the digital music sphere. The fact that Apple was in this early exploratory stage seems to have played a role in fostering their strong interest in Fadell's ideas. As demonstrated in the case description, Fadell initially approached another company, RealNetworks, and was even hired by that company. However, because RealNetworks had already pro-

### *Attraction: A new driver of learning and innovation*

gressed further in the development process and had a finished platform and established products in the digital music space, they were not willing to make the necessary investments to realize Fadell's ideas, and as a result, Fadell quickly left the company to approach Apple instead. This suggests that it was crucial that Fadell approached Apple at a stage when the company had made some initial exploratory gestures towards the area of digital music, but had not yet made substantial investments in a specific technological or commercial trajectory. As a result, Apple was interested in the market potential of such a move and had acquired *the prior knowledge* that was needed to recognize the value of Fadell's ideas (Cohen & Levinthal 1990, Zahra & George 2002), but was still sufficiently *flexible and uncommitted* with respect to its future strategy to be able to adopt and take advantage of Fadell's ideas (Gavetti & Rivkin 2007).

### **Conclusions**

In sum, this section demonstrates how Fadell's idea and vision acted as *inspiration and a catalyst* in the redeployment of the Apple's existing resources and capabilities into new uses in the emerging digital music industry (Penrose 1959, Danneels 2007). It further shows how Fadell's role as an outsider to Apple allowed him to identify opportunities that were difficult to perceive from within the company (Edman 2009). More generally, the case findings point out that it is difficult, under *strategically complex circumstances*, such as those that characterized Apple's specific situation and the more general state of the emerging digital music space in the early 2000s (Regnér 1999), for a focal firm to identify all the relevant opportunities from which it could potentially benefit. As a result, external actors that observe the focal firm and the larger environment from *a different vantage point*, based on a different set of capabilities and cognitions, may inform the focal firm about opportunities that could not be identified from within the company (Tripsas & Gavetti 2000, Shane 2000, Denrell et al. 2003).

★ ★ ★

Finally, after having outlined how the findings of this case study inform our understanding of the attraction concept, in the following section these implications will be compared to the findings of the study of the creation of the digital synthesizer that were presented in the previous section.

### 3.1.3 Cross-case analysis: Apple (iPod) and Yamaha (DX7)

The two case studies provide concrete examples of how externally generated ideas were introduced into established firms and in different ways contributed to innovation, growth, and strategic change. In addition to providing some preliminary empirical validation of the theoretical arguments made in the previous chapters, these real-world examples of attraction processes also offer a set of preliminary findings about attraction, as well as revealing a number of questions related to attraction that warrant further attention in the future empirical investigations.

#### Different types of impulses and different outcomes

First, the case findings point to certain differences between the external impulses that Apple and Yamaha encountered. Whereas Tony Fadell's ideas for a new business model in the digital music sphere based around a handheld device and a proprietary downloading service had a strong commercial focus and paved the way for a new class of products and services that were not offered by Apple at the time, John Chowning had little commercial focus and was motivated primarily by an ambition to see his discovery of FM synthesis put to use to create better electronic instruments. As a result, whereas Fadell's initiative pointed Apple towards *a commercial opportunity* to enter a new market (Danneels 2002, 2007), the FM synthesis concept developed by Chowning represented a potential *solution to a technological problem* that had hampered the development of an already-envisioned new product category (Jeppesen & Lakhani 2010).

Because of the divergent nature of the impulses that Fadell and Chowning brought to Apple and Yamaha, respectively, key differences also emerge in the case findings with respect to the impact that these impulse providers and their ideas exerted on the recipient firms. As described previously, whereas Fadell's contribution can be likened to *sowing the seed of a new product category and a new business model* within Apple, Chowning's contribution, on the other hand, can be likened to *sowing the seed of a new core technology and a new core competency* in digital music within Yamaha (Prahalad & Hamel 1990, Patel & Pavitt 1997). These findings indicate that firms tend to attract different types of impulses and that these impulses can influence the firms in a number of different ways, which in turn suggests that it is essential to the further study of attraction to learn more about these

different types of external impulses and to study the ways in which different types of impulses affect the recipient firms.

### **Why was (internally initiated) search insufficient?**

The analysis of the case findings further offers certain insights about why the attraction of external impulses was instrumental for the development of the iPod and the digital synthesizer, and why the search efforts of the focal firms were insufficient to identify the relevant opportunities and to solve the problems associated with developing the new products. These specific findings also speak to the general question of why attraction can be beneficial to firms and why it can provide the recipient firm with ideas and resources that it would otherwise have overlooked. First, the analysis suggests that the search efforts of Apple and Yamaha were inhibited by the fact that *they did not know exactly what they were looking for*. The Apple case shows that even though the company was on the look for “the next big thing,” the company had not yet envisioned a business model based on the combination of a handheld digital music player and a proprietary downloading service, and was hence not in a position to explore this opportunity before Fadell informed the company about his ideas. Likewise, in the case of Yamaha, even though the company was engaged in a search for solutions that would enable the development of a digital synthesizer, the company seems not to have been aware of the type of capabilities that were indeed necessary to successfully develop such a product.

Second, the study suggests that the way knowledge is structured in a field may also render the search process difficult. The Yamaha case indicates that *the immaturity of the field of digital music* and the ensuing *lack of institutionalized structures for producing and searching for knowledge* led to Yamaha’s failure to identify adequate solutions to its problems, and further, that the attraction of an external impulse therefore played a key role in the company’s development of the digital synthesizer. In addition, the case analysis indicates that a *complex strategic context* may render search problematic, since the potential search space that exists under such circumstances is often so vast that the firm cannot identify all opportunities that are potentially available, which may in turn result in a situation in which the attraction of external impulses informs the firm about options it had failed to identify through its own search (Lane & Maxfield 1996, Mosakowski 1997, Regnér 1999).



### Chapter 3

In sum, these findings provide some initial indications as to why the attraction mechanism can be of importance to firms and under what circumstances it is more valuable or less valuable for firms. The findings also suggest that further study of these questions could be merited in order to develop these preliminary findings and to identify additional factors that could contribute to answering these questions.

#### Attraction as a by-product of regular operations

In addition to the differences that were described in the previous section with respect to the nature of the external impulses and the effects that they had on Apple and Yamaha, certain similarities also emerge from the case findings. First, with respect to the processes through which Apple and Yamaha became exposed to the external impulses, it is notable that the external impulse was not the result of an active attempt on either company's part to attract ideas or inventions. The attraction that they exerted, and which compelled the impulse providers to approach them, should hence be understood as *a byproduct of their regular operations*, rather than the result of any deliberate efforts undertaken by Apple or Yamaha to build attraction and to stimulate an inflow of external ideas and inventions. This finding, in turn, highlights a number of questions about which factors allow a firm to attract ideas and inventions from the external environment, and why impulse providers choose to approach certain firms but not others.

Second, both cases point to the fact that it is critical that the receiving firm should possess certain *prior knowledge within the target area* in order to recognize the value of the external impulse. In both cases, the impulse was offered initially to other actors who either turned it down or were unable to develop it further. In the case of the iPod, the idea was initially presented to another company known as RealNetworks, and in the case of FM synthesis, the solution was first introduced to American manufacturers of electronic organs. In both cases, these actors chose not to adopt the proffered ideas, suggesting that the mere act of attracting interesting ideas and inventions is not enough if a firm lacks the necessary prior knowledge to value and take advantage of them (Cohen & Levinthal 1990, Zahra & George 2002).

★ ★ ★

### *Attraction: A new driver of learning and innovation*

In sum, this comparative analysis of the attraction processes related to the creation of the digital synthesizer and the iPod, respectively, offers a number of insights about attraction, as well as helping to frame a set of questions that warrant additional attention and which provide guidance for the further empirical study. Particularly, the analysis underscores the need for further study pertaining to how different types of impulses influence recipient firms. Further, it reveals the need for additional study of the factors that make firms attractive to external innovators and the circumstances under which attraction is more or less relevant and valuable for firms.

### **3.2 Pilot study Part 2: Systematic attractors**

As explained previously, the second part of the study focuses on two firms that have devised methods by which deliberately to build and leverage attraction. The companies are the American venture capital firm, Draper Fisher Jurvetson, which pursues an attraction-based approach for the identification of investment opportunities, and the American consumer goods company Procter & Gamble, which is known for its open approach to innovation.

As suggested previously, the decision to study firms that deliberately seek to attract external impulses is in accordance with the logic of theoretical sampling, which is typically recommended for case study research (Eisenhardt 1989a, Suddaby 2006). Because of their explicit aim to try to build attraction, Draper Fisher Jurvetson and Procter & Gamble were both perceived to provide appropriate settings for learning more about the dynamics of attraction, since attraction processes are more prevalent and more visible within these firms than in the average firm.

Notably, the case companies were selected from completely different industry settings, as Procter & Gamble is a consumer goods company, whereas Draper Fisher Jurvetson is a venture capital company. This diverse selection of cases was guided by an ambition to capture the variation in the forms that the attraction mechanism takes in different environments, in order to gain a broader understanding of the phenomenon.

### Chapter 3

As was the case with the first part of the pilot study, the second part is built on a combination of primary and secondary data. Both companies have been frequently recognized in the business press, and there are therefore a large number of interviews with managers of the companies available online that deal with issues related to the topic addressed in this study, which proved to be useful as data sources. Both firms also have open policies in terms of describing their business model and their approach to innovation, which further facilitated the data collection and the analysis of the companies. In addition to the secondary data, I also collected primary data.

At Stanford University, I participated in a seminar led by Steve Jurvetson, managing director of Draper Fisher Jurvetson, where he offered an in-depth description of his firm's venture capital model and, in particular, its approach to the identification of new investment opportunities. After this, I was also provided with the presentation material.

With respect to Procter & Gamble, in 2007 I participated in a two-day workshop on the topic of "open innovation" that was arranged by the technology brokerage firm yet2.com. Several members of Procter & Gamble's external business development unit, including director Mark Peterson, were present at the symposium. During the workshop, I was able to interact informally with the Procter & Gamble personnel and inquire further about their particular approach to innovation and the methods they use to attract and leverage external ideas, products, and technologies.<sup>42</sup>

The analysis of the data followed the same pattern that was used in the first part of the pilot study, i.e., I first wrote a case description of each company in order to gain a general understanding of their business model. Then, I identified the attraction-related aspects of each company, and based on that, I conducted a within-case analysis focused on the role that attraction plays in each of the companies. These within-case analyses were then compared to one another in a cross-case analysis, in which similarities and differences between the two cases were outlined and analyzed.

---

<sup>42</sup> For more information about the sources, see Appendix A.

### **3.2.1 Draper Fisher Jurvetson: Attracting investment opportunities**

“We want to become a powerful magnet, so that the needles in the haystack find us.” (Steve Jurvetson, *Managing Director, Draper Fisher Jurvetson*)<sup>43</sup>

#### **Introduction**

Draper Fisher Jurvetson (DFJ) is an American venture capital firm based in Menlo Park, California. DFJ specializes in early-stage investments, providing seed capital to firms in the nascent phases of their development.<sup>44</sup> Being located in the heart of Silicon Valley, DFJ is focused exclusively on the high-technology sectors, and its primary investment areas are information technology, life sciences, nanotechnology, and clean energy technology. Firms that have been funded by DFJ include Internet telephony provider Skype (later acquired by eBay), e-mail provider Hotmail (later acquired by Microsoft), and the leading Chinese search engine Baidu. The aspect of DFJ that makes it particularly interesting in this context, and which will be described and analyzed at length in subsequent sections, is its *attraction-based approach to opportunity recognition*, manifested in the quote excerpted from managing director, Steve Jurvetson, at the beginning of this section, in which he states that DFJ seeks to be *a magnet that attracts investment opportunities*.

#### **DFJ's venture capital model**

DFJ targets the type of investment opportunities that promise the highest possible rate of return (“upside”), and therefore also pose the highest risk of total loss in the investment.<sup>45</sup> A number of the unique properties in DFJ's venture capital model have been created to support this ambition of investing in companies with extremely high potential. First, as described above, DFJ specializes in providing startups with seed capital. Entering at an early stage raises the risk, but also increases the potential upside for the investor, since company valuations are still low at the early stages due to the high level of un-

---

<sup>43</sup> Jurvetson (2007).

<sup>44</sup> The company was founded in 1985 under the name Draper Associates by Tim Draper. Since its inception, DFJ has financed close to 600 companies, and by 2008, the company was managing approximately US\$6 billion in capital. DFJ employs 140 venture capital professionals (<http://www.dfj.com/about/>).

<sup>45</sup> Austin (2009).

### Chapter 3

certainty. Second, DFJ focuses its attention on start-up companies in new and emerging industries, since investing in emerging industries raises the potential of the venture, as there tends to be more potential for growth in emerging industries and a higher probability of capturing a larger share of the market, since there are often no dominant incumbents. Third, DFJ seeks primarily to invest in new ventures that are based on radical and disruptive innovations and that have few equivalents in the market, which maximizes the upside, but which also leads to a lower probability of success, as firms pursuing radical innovations tend to meet more resistance and receive less help from other firms in the process of building the market.<sup>46</sup> In sum, these investment criteria support DFJ's investment strategy of accepting a high risk of total loss if the venture possesses significant potential.<sup>47</sup>

DFJ's investment strategy is associated with a number of challenges that are shared with other firms in the venture capital industry to some degree, but which tend to be exacerbated by DFJ's exclusive focus on seed capital in emerging industries. Three key challenges are: (i) the identification of investment opportunities, (ii) the process of learning about new and emerging areas where investment opportunities may arise, and (iii) developing the internal organizational structures and processes necessary to support the high risks associated with its investment strategy. Each of these challenges is discussed in the following sections, along with a description of the methods DFJ employs to address these issues and how they are related to the attraction concept.

#### **Attraction and the identification of investment opportunities**

Steve Jurvetson, partner and managing director of DFJ, refers to the task of identifying innovative start-ups as "searching for a needle in a haystack," because at the earliest stages in the life cycle of a start-up, the venture typically has low visibility as a result of having no finished products or existing customers, which in turn can make it ex-

---

<sup>46</sup> Needleman (2009).

<sup>47</sup> Notably, many venture capital firms display similar investment strategies in principle, i.e., a high failure rate is accepted because they are compensated by a small number of successes, or so-called home runs. DFJ, however, inhabits an extreme position on the risk/reward trade-off continuum with its aggressive focus on early-stage investments in new and emerging industries.

*Attraction: A new driver of learning and innovation*

ceedingly difficult to identify.<sup>48</sup> In some instances, the founders of new ventures have previously started companies and have, as a result, built up personal networks that may have direct or indirect connections to DFJ, making the start-ups somewhat easier to identify. However, at other times, the entrepreneurs have not yet developed extensive personal or professional networks and are therefore unlikely to be visible in the usual spheres in which venture capital firms such as DFJ are present. When attempting to identify the very youngest ventures, Jurvetson argues that established networks often prove to be inadequate. He further suggests that the most disruptive and unique ideas tend to emerge in unexpected milieus, often far outside of the boundaries of established industries and networks, and as a consequence, traditional methods and information channels that may work well for scanning for ideas within the boundaries of an existing industry tend to be less effective when it comes to identifying the type of ventures in which DFJ is particularly interested.

In sum, DFJ's preference to seek out and invest in early-stage companies that are pursuing radical innovations in new, and sometimes nonexistent, industries can render the search process particularly difficult. In response to the inherent limitations of relying on searches within existing networks and channels and the resulting difficulty of identifying ventures that match DFJ's investment preferences, the firm employs an approach to the identification of investment opportunities that is largely based on the concept of attraction, allowing new ventures to find DFJ, rather than vice versa. Attraction is perceived to be vital to the process of identifying investment opportunities for several reasons. Steve Jurvetson explains that because DFJ is a well-known firm with an established reputation and the resources to make itself visible, it is more likely that an entrepreneur who is starting a small firm will be able to find DFJ than the other way around. Because of this asymmetry in visibility, the attraction mechanism can generate a much larger number of investment opportunities than DFJ could identify by conducting its own search activities and relying solely on its existing networks. Each year, DFJ receives as many as 30,000 business plans, which clearly exceeds the number of ventures that the company could have identified through own search activities. This enormous "deal flow" is considered to be a critical success factor for DFJ because it increases the variation in

---

<sup>48</sup> Jurvetson (2007).

### Chapter 3

the population of investment opportunities from which the company selects its investments, which in turn increases the chances that a small number of *extreme outliers* are included among the up to 30,000 proposals the company attracts each year.<sup>49</sup>

#### Attraction to overcome sampling biases and learning traps

Related to this point, attraction also fulfills another function for the firm. DFJ does not rely exclusively on attraction to select its investments; rather, the company also conducts its own search activities and all employees and partners at DFJ are expected to build and cultivate their personal networks in order to be in a better position to identify investment opportunities. However, although these methods clearly are useful and can lead to the identification of valuable opportunities, Steve Jurvetson emphasizes that they tend to be subject to limitations and biases as a result of so-called *homophily*, i.e., the inclination of people to seek contact and interactions with those who are similar to themselves, which in this case means that the people at DFJ will tend to notice and interact with entrepreneurs who think the same way that they do and who work on ideas that they intuitively find appealing and consistent with the way they themselves think.<sup>50</sup>

Such tendencies are argued to be an impeding factor when searching for genuine novelty and radical innovations, since they lead to a situation in which DFJ's sampling in the pool of entrepreneurs and investment opportunities is strongly influenced by the preferences, backgrounds, and mindsets of the people working for DFJ. However, Jurvetson argues that attraction can help to alleviate this sampling bias, since the business plans that DFJ tends to attract often originate from sources outside the firm's existing networks and from people who are different than those in the employ of the firm. As such, the attraction mechanism exposes DFJ to a more diverse pool of ideas and extends the spectrum of entrepreneurs and opportunities from which the firm samples.<sup>51</sup>

---

<sup>49</sup> *Ibid.*

<sup>50</sup> See McPherson et al. (2001).

<sup>51</sup> Importantly, however, attraction per se does not automatically solve the problem of homophily, since it may still have a powerful effect on which investment opportunities ultimately get selected. Further, if the entrepreneurs that submit business plans also seek investors who are similar to themselves, the homophily bias remains intact. Still, as explicated in a subsequent section, DFJ has developed methods for addressing these limitations.

### **Building attraction**

DFJ's attraction-based approach rests on a number of activities aimed at making the company a powerful magnet. First, DFJ systematically tries to make the company *highly visible* through a large number of visibility-enhancing activities such as extensive blogging<sup>52</sup>, speaker engagements<sup>53</sup>, and media appearances<sup>54</sup>. Essentially, the senior staff at DFJ will embrace most opportunities to make the firm better known through the above-mentioned channels. In addition, DFJ was among the first venture capital firms to have its own website, a project that was undertaken at a time when most VC firms were secretive about their businesses and had little desire to make their firms publicly known.<sup>55</sup>

A key objective of these efforts is to make the firm visible beyond its own existing networks and to become well-known among people who are not part of DFJ's regular networks, or, in the words of Steve Jurvetson, to gain visibility in "strange networks." In order to achieve this, the partners and employees of DFJ seek to make the firm visible not only in settings that have historically proven to be sources of interesting opportunities and therefore *ex ante* can be expected to have a high probability of harboring valuable opportunities, but also in new and untried circumstances. As an example of this approach, Steve Jurvetson has garnered substantial coverage in the press for giving a number of talks on rocket launching, which happens to be one of his personal hobbies. Steve Jurvetson gives these talks not only because of his great interest in rockets, but also as a way to illustrate and act on DFJ's philosophy of making the firm visible in a broad variety of settings. As a result of these talks, DFJ has been granted a number of opportunities to invest in rocket-related technologies.<sup>56</sup>

However, while it is acknowledged by Steve Jurvetson that visibility is key, he also stresses that the message that is communicated and the "content" of the visibility are equally important. As such, a key aim of DFJ's efforts is to try to associate certain new areas of investment with the firm from the very earliest stages of development

---

<sup>52</sup> The J Curve. Available online: <http://jurvetson.blogspot.com>.

<sup>53</sup> Stanford University's Entrepreneurship Corner.

<sup>54</sup> [http://www.dfj.com/news/cat\\_index\\_2.shtml](http://www.dfj.com/news/cat_index_2.shtml).

<sup>55</sup> <http://www.dfj.com>.

<sup>56</sup> TED (2007).



### Chapter 3

and thus to establish *a position of leadership in people's perceptions* in the emerging sector.<sup>57</sup> As an example of how this strategy is applied, Jurvetson explains how he and his colleagues at DFJ proceeded in the early 2000s, as the firm began to notice early indications that *nanotechnology* was emerging as an area in which future investment opportunities might arise. As soon as they had received these still-“noisy” signals that nanotechnology might become an interesting field within a few years’ time, Jurvetson began giving speeches about nanotechnology at conferences and other events and made frequent media appearances during which he shared his predictions related to the field.<sup>58</sup>

Importantly, this occurred before Jurvetson or anyone else at DFJ had acquired any in-depth knowledge and expertise about nanotechnology, and before there were any concrete investment opportunities available. But by publicly associating the firm with nanotechnology, DFJ -- and Jurvetson himself -- rapidly became symbols of the emerging field of nanotechnology to which people turned when seeking to inform themselves about nanotechnology.<sup>59</sup> More importantly, this approach gave DFJ an advantage when new start-ups began to emerge within this arena, as evidenced by the fact that the firm was offered a large number of nanotechnology-related investment opportunities.<sup>60</sup> In addition, because of its reputation as a leader in the nanotechnology space, the firm also had an advantage when promising new nanotech ventures began selecting among competing offers from several venture capital firms.

A significant aspect of this open strategy, in which the firm freely shares its insights and knowledge about an emerging field at conferences and in the media, is that it contradicts much of the received wisdom in the venture capital industry. Traditionally, *secrecy*, not openness, has been the dominant mode of operations in the venture capital industry, based on the logic that by keeping information about emerging areas secret, the competition for the investments within the target area will be less intense. The assumption at DFJ, however, is that the benefits of openness far outweigh the advantages of secrecy.

---

<sup>57</sup> Jurvetson (2007).

<sup>58</sup> Calvey (2001).

<sup>59</sup> Kanellos (2004) and Pogue (2005).

<sup>60</sup> Thayer (2005).

### *Attraction: A new driver of learning and innovation*

An additional strategy that DFJ uses for learning and attracting opportunities is to invest as early as possible in new and emerging arenas, even if that entails frequent failures.<sup>61</sup> The rationale for this is that investing early has a significant signaling effect, which reinforces the previously described strategy of trying to establish leadership in the minds of the public. Certain carefully selected early investments can therefore be justified in part by the fact that they help to establish a perception that DFJ operates as a leader within that particular area, which ultimately increases DFJ's attraction and fosters the inflow of investment opportunities within the emerging sector.

#### **Attraction as a driver of learning**

The method of publicly associating the firm with nanotechnology in the early stages of the field's emergence also played a central role for DFJ's *organizational learning*. Generally speaking, the practice of investing in new ventures in emerging and uncharted industries places a high demand on the venture capitalist's knowledge and ability to learn about the new areas in which their existing or potential portfolio companies are active. In order to be able to evaluate new investment opportunities and support portfolio companies with capital and other resources, being knowledgeable about the fields in which it invests is crucial for any venture capital firm.

As explained previously, neither Steve Jurvetson nor any of his DFJ colleagues had any in-depth knowledge about nanotechnology when they began their campaign of speaking publicly about the new field. However, giving speeches at conferences and talking in the media about nanotechnology proved to be a valuable mechanism for learning more about nanotechnology. By being present in settings where many people were interested in the field and where many of those who were knowledgeable in the area had congregated, DFJ personnel rapidly became an important part of the relevant network within which learning and knowledge transfer took place. As the growing perception of DFJ as a pioneer in the nanotech arena continued to take hold, many people working in the nanotech industry initiated contact with DFJ, not only in order to "pitch" a specific business plan but sometimes merely to begin a dialogue. Taken together, this mushrooming network of activity and involvement exposed the people of DFJ to new knowledge, which in turn enabled the

---

<sup>61</sup> Jurvetson (2007).

### Chapter 3

firm to grow rapidly into the role it had already assumed as a leading expert in nanotech, positioning DFJ to gain access to more investment opportunities and to evaluate these opportunities with greater insight and acuity.

In sum, these examples demonstrate how DFJ deliberately *stretched its identity into a new area*. Although in reality, the firm initially had little existing expertise in the field, DFJ worked determinedly to acquire such expertise, and as a result, the public began to associate DFJ with the new area, which in turn had significant learning effects for the organization and positively impacted the inflow of investment opportunities.

#### **Attraction and the internal processes at DFJ**

Significantly, Steve Jurvetson emphasizes that an attraction-based approach to opportunity identification and learning requires that certain internal structures and values are in place within the firm to support the strategy. Essentially, DFJ's attraction-based strategy is aimed at exposing the firm to maximum variation with the ambition of increasing the likelihood that the firm will be able to identify the true outliers among available start-ups, and to select those that have the potential to open up a new market or disrupt an existing one, and thereby to generate extreme returns to its owners and investors.

However, even if DFJ manages to attract these extreme outliers, there is no guarantee that the firm will benefit, because the start-up may well be weeded out in the rigorous evaluation process whereby DFJ culls its yearly deal flow of up to 30,000 business plans to approximately 12-24 targeted investments per year.<sup>62</sup> Being able to identify at least some of the extreme outliers that the company attracts is essential for the company's success, because if the firm fails to take advantage of the large variation it attracts, all of the visibility-enhancing measures that contribute to stimulating the inflow of business plans would only result in additional evaluation costs without the commensurate creation of benefits. Identifying the outliers among the huge number of business plans that DFJ has to evaluate each year is, however, quite challenging; in fact, under many circumstances, it is likely that the outliers would not be selected, because radical ideas by their very nature contradict existing wisdom, and therefore tend to incur skepticism and resistance.

---

<sup>62</sup> Jurvetson 2007.

### *Attraction: A new driver of learning and innovation*

In order to respond to the natural tendency to avoid the most radical and counter-intuitive ideas, DFJ has implemented a key principle related to the selection of investments, namely, unanimity is *not* sought within DFJ when it comes to investment decisions, and each partner at DFJ has a substantial degree of latitude in selecting the project that he or she wants to champion. This means that a committed and enthusiastic minority can outvote the majority. The rationale behind this principle is that it is believed that if all partners at DFJ approve of an investment, the idea is probably not sufficiently radical to possess the high risk/reward level that DFJ strives to achieve. As a result, it is stated that the basis for the firm's investment decisions is *not compromise but strong beliefs by individual partners*. In essence, the criterion for deciding to invest in a venture is not that all partners agree, but that one or two partners feel very strongly about the idea and are willing to champion it.<sup>63</sup>

#### **Findings and implications: Attraction as a driver of exploration and variation**

The DFJ case description offers a number of general findings related to attraction. First, the case illustrates how attraction can be used as a means to generate *variation and diversity*, which supersedes what a focal actor can find through its own search and within its existing networks (March 1991, Miller 1993). As such, the case also illustrates the significant degree of *asymmetry that often exists between attraction and search*, in the sense that DFJ attracts many more investment opportunities than it could possibly find through its own search activities, and further, that the opportunities it attracts often are markedly different from the ones the company finds through its own search activities. The latter point is manifested in that attraction is used by DFJ to counteract the common tendency by organizations and people to find and select opportunities that are similar to the ones that have been selected in the past and which are congruent with the values and knowledge structures of the people conducting the search (cf. Granovetter 1973, McPherson et al. 2001). Hence, by employing an attraction-based strategy, DFJ seeks to gain access to a set of opportunities that the company would not otherwise have found and which may contradict existing values and mindsets among the company's personnel (Prahalad & Bettis 1986, Lyles & Schwenk 1992, Page 2007).

---

<sup>63</sup> Austin (2009).

### Chapter 3

Second, the DFJ case shows how the company engages in a set of elaborate activities aimed at *building attraction*, and points to some of the links between the ways in which a firm presents itself outwardly and the inflow of external impulses that it attracts. Specifically, the case study points to the role of visibility as a prerequisite for attracting external impulses. It further suggests that in order for attraction to be genuinely valuable and to result in opportunities that the firm could not have found through its own search activities, *visibility needs to reach beyond the firm's own horizons and networks* (Jeppesen & Lakhani 2010). In line with this, the study further outlines the ways in which DFJ attempts systematically to make itself visible in the broadest networks possible in order to attract opportunities to which the firm otherwise would not have been exposed (cf. Granovetter 1973).

The case also shows that visibility per se is not enough to foment attraction in the external environment; rather, the content of the visibility is equally important. First, the case suggests that in order for a firm to attract a broad range of external impulses in areas that lie outside of its current core areas, it needs to *stretch its identity* (cf. Gioia et al. 2000). This means that the firm has to extend the way it presents itself, as well as the message it communicates about the strategy and the identity of the firm, *beyond its current core areas*. Doing this will increase the ability of the firm to attract opportunities from a broader range of sources and hence will create a more diverse pool of opportunities from which to select. Second, the case illustrates the importance of creating *a position of leadership in people's perceptions* in emerging fields in which the firm takes a specific interest, since the way the focal firm is perceived by external actors within different areas determines how effective the firm is at attracting opportunities from these areas.

This last point about establishing a position of leadership in people's perceptions relates to a third finding of the study, which is that attraction can be *a competitive activity* and *an organizational capability* which can be used to gain competitive advantage (Eisenhardt & Martin 2000, Teece 2007). Specifically, the study shows that DFJ systematically seeks to improve its ability to attract external impulses, and that this ability to attract large numbers of investment opportunities is perceived by the firm to be a major source of competitive advantage in its industry. On a more general level, this indicates that attraction is one of the mechanisms through which the competi-

### *Attraction: A new driver of learning and innovation*

tion for valuable resources and opportunities in *the strategic factor market* is fought (Barney 1986, Makadok & Barney 2001, Denrell et al. 2003).

★ ★ ★

Altogether, the findings demonstrate how attraction can contribute to *widening the scope of a firm's vision* beyond what it could have achieved through its own search and within its existing networks, and that it therefore can be an important mechanism for providing variation and diversity to the recipient firm. The study further explicates some of the ways in which firms can deliberately build attraction and influence the quantity and nature of the external impulses that it attracts, in an effort to gain an advantage in the competition to identify opportunities in the strategic factor markets.

These findings and implications will be further discussed in a subsequent section in which they will be compared to the findings of the other pilot case studies. In the next section, the case study of Procter & Gamble and its externally oriented approach to innovation will be described and analyzed.

#### **3.2.2 Procter & Gamble: Attraction and open innovation**

*"It comes down to: How do we get those great ideas?" (Jeff Weedman, Vice President, External Business Development, P&G)<sup>64</sup>*

##### **Introduction**

Procter & Gamble (P&G) is the world's leading consumer goods company, with an annual turnover of 79 029 million USD.<sup>65</sup> The company markets approximately 300 brands in over 180 countries across North America, Latin America, Europe, and Asia, and the company is engaged in a wide variety of product areas such as deodorants, detergents, toothpastes, shaving products, snacks, and diapers. Some of P&G's best-known brands are Crest (oral hygiene products), Pringles (snacks), Pampers (diapers), and Gillette (shaving products). In the context of the current study, the most interesting aspect of P&G is

---

<sup>64</sup> Staggs (2008).

<sup>65</sup> P&G (2010).

### Chapter 3

that the company has conducted a major overhaul of its approach to innovation in the last 10 years. Once an inwardly oriented company that relied heavily on its internal R&D department, P&G has in recent years emerged as a company that draws extensively on external sources of innovation, and which has pioneered *open innovation*. A key aspect of P&G's new approach to innovation is the ambition to *attract externally developed ideas and inventions* to the company, which are then leveraged by combining them with P&G's capabilities in product development and consumer marketing. In line with the general theme of this study, this section sets out to describe the role that the attraction of externally developed ideas and inventions plays in P&G's innovation processes and to relate the company's approach to innovation to the attraction concept. However, before addressing this specific question, a background description is provided in the next section, which briefly outlines how P&G has transformed its approach to innovation.<sup>66</sup>

#### **P&G's innovation model: Connect + Develop**

The introduction of P&G's new approach to innovation was preceded by a decline in performance throughout the late 1990s. During this period, sales growth failed to live up to expectations, no major new product areas were developed, and P&G's costs for innovation and R&D were higher those incurred by comparable companies. As a consequence of this performance decline, the then-current president and CEO, Durk Jager, was replaced by Alan G. Lafley, who would become a driving force in the reinvention of P&G's innovation model. Lafley believed that the root cause of P&G's problems was the company's inward-oriented approach to innovation and its heavy reliance on internal R&D. Lafley also believed that P&G's approach to innovation needed to be fundamentally reengineered and transformed in such a way that it would allow the company to be able to draw upon the creativity and innovative capability of external inventors, entrepreneurs, and researchers. In line with this analysis, Lafley soon launched a program requiring that 50 percent of all new P&G products should be externally sourced or based on external ideas; in

---

<sup>66</sup> The general story of P&G's transformation of its innovation model has been described in academic journals (Huston & Sakkab 2006, Dodgson et al. 2006), books (Chesbrough 2006), and in business magazines (Knowledge@Wharton 2007). This section is a short summary of the key points of this previous literature.

*Attraction: A new driver of learning and innovation*

doing so, Lafley hoped that P&G would be transformed from a company dominated by a “not invented here” attitude to a company characterized by a “proudly found elsewhere” mentality. This was a radical idea, given that the overall proportion of externally developed products at the time was 15 percent, and that P&G historically had relied heavily on its internal R&D departments, complemented by a network of trusted suppliers, to invent, develop, and deliver new products to the market, and hence had not actively sought to connect with new external innovators.

Larry Huston, former Vice President of Innovation at P&G, and Nabil Sakkab, Senior Vice President of Research and Development at P&G, explain that this ambition was based largely on the insight that there existed an increasing supply of external innovation, and that this innovation, in many areas, was as good or better than what was being created within P&G’s own R&D units<sup>67</sup>:

“We discovered that important innovation was increasingly being done at small and midsize entrepreneurial companies. Even individuals were eager to license and sell their intellectual property. University and government labs had become more interested in forming industry partnerships, and they were hungry for ways to monetize their research.”<sup>68</sup>

Another key driver of the decision to open up the innovation process and to start tapping external sources of innovation was the diverse nature of P&G’s product portfolio and customer base, which requires P&D to utilize technologies from many different fields. Maintaining in-house state-of-the-art competence within all the relevant technology areas was becoming increasingly difficult and expensive, as the required technologies were developing exponentially and were rapidly becoming more sophisticated. The problems associated with relying only on in-house development were also exacerbated by the fact that heightened competition from new and more focused competitors had

---

<sup>67</sup> An internal estimation made by P&G suggested that for each of the 7,500 scientists and engineers employed within P&G’s R&D function, there were about 200 equally capable scientists or engineers working within the same field outside of the company, adding up to a total population of 1.5 million people. This calculation, which exemplifies the open innovation credo that “not all smart people work in this company,” triggered a redefinition of P&G’s research organization from merely including the people employed by P&G to including all potential providers of innovation (Huston & Nakkab 2006).

<sup>68</sup> Huston & Sakkab (2006).



### Chapter 3

made time-to-market for new products more critical, which meant that even if P&G had the required capabilities internally, it often took too long for the end product to reach the market. In sum, it had become clear that there were substantial benefits associated with the inclusion of external sources of innovation in P&G's innovation process, not only because it would give P&G access to ideas and technologies not available in-house, but also because it could reduce innovation-related costs and speed up the innovation process.

Based on this analysis of the need to integrate external innovation in P&G's own innovation processes, a new externally oriented approach to innovation was formulated and, as mentioned previously, was given the name Connect + Develop. The essential concept behind the Connect + Develop approach is summarized by Larry Huston, former Vice President of Innovation at P&G, and Nabil Sakkab, Senior Vice President Research and Development at P&G, thusly:

“We could identify promising ideas throughout the world and apply our own R&D, manufacturing, marketing, and purchasing capabilities to them to create better and cheaper products, faster.”<sup>69</sup>

In terms of the nature of these promising ideas that P&G began to look for, two main categories can be identified. First, the company sought external solutions to existing R&D-related problems, such as developing a rapid, inexpensive, reliable test to detect even small levels of acrylamide in foods or finding a method for reducing the caloric density of snack products without affecting the taste of the product. Second, P&G sought ideas for new products not currently marketed by P&G, e.g., a new electric toothbrush or a new type of air freshener.<sup>70</sup>

---

<sup>69</sup> Huston & Sakkab (2006).

<sup>70</sup> In addition to the core aim of Connect + Develop, which is the identification and in-sourcing of ideas, technologies, and products from external actors, Connect + Develop is also intended to support the out-licensing of P&G's own intellectual property. For the purposes of this study, the in-sourcing of externally generated innovations that will serve as the main focus of the analysis. In terms of the relative proportion between in-sourcing ideas and out-licensing P&G intellectual property, Jeff Weedman, Vice President of P&G's External Business Development, estimates that about two-thirds of the work the External Business Development unit does is related to the in-sourcing of external input (Staggs 2008).

### **Identifying external ideas and inventions: Search and attraction**

Given the Connect + Develop approach, a key challenge for P&G's innovation process is to identify valuable, externally generated ideas. As articulated by Jeff Weedman, Vice President of External Business Development at P&G:

"It comes down to: How do we get those great ideas?"<sup>71</sup>

P&G employs a number of methods to address this challenge. Essentially, the identification of external innovation in the Connect + Develop model builds on a combination of search-related activities and other processes aimed at stimulating the attraction of external ideas and inventions. One important search-related thrust is the Technology Entrepreneurs Network, which is an extended network of 70 individuals that help link P&G to external innovation possibilities. The technology entrepreneurs are scientists and specialists in fields related to the technology needs of one or more of P&G's Global Business Units. They are data mining specialists who use advanced data mining tools to search billions of web pages, scientific literature and databases, and countless global patent clearinghouses. These technology entrepreneurs also combine this electronically mediated mining of data sources with physical prospecting for ideas, which can entail activities such as surveying the shelves of stores in different countries or combing technology fairs for ideas and inventions.<sup>72</sup>

In addition to these search efforts, P&G also relies heavily on external actors' willingness to self-select and approach the company with new ideas and inventions, and the company tries actively to stimulate such an inflow of ideas. Jeff Weedman, Vice President of External Business Development at P&G, makes this goal of attracting external impulses explicit, stating that:

"We really set it up to be an efficient enterprise for ideation with the public, so they will be open to submitting ideas to us. [...] Ultimately, we want

---

<sup>71</sup> Staggs (2008).

<sup>72</sup> The technology entrepreneurs work out of six hubs in China, India, Japan, Western Europe, Latin America, and the United States. Each hub focuses on finding products and technologies that are specialties of its region (Dodgson et al. 2006).

## Chapter 3

people with great ideas to come to us and let P&G show them how to best use those ideas.”<sup>73</sup>

Mark Peterson, Director of External Business Development at P&G, further explains that the Connect + Develop portal constitutes the most efficient way of accessing external ideas.

“The best way to get them [ideas and innovations] in efficiently these days is actually via the web. We have a website where people submit their ideas.”<sup>74</sup>

### Attraction-enhancing activities

As part of the Connect + Develop program, the attraction of external impulses is stimulated through a combination of activities intended to promote *increased openness*, *increased visibility*, and the building of *an innovation brand*, all of which are discussed in this section.

P&G’s ambition to promote openness and transparency with respect to its innovation process takes several forms and represents a dramatic shift from its traditional approach to innovation. First, P&G has developed a website dedicated to the Connect + Develop program, where on a regular basis, company representatives post specific product areas within which P&G is currently developing new products and is looking for external actors who can contribute. These so-called technology briefs are also distributed in other ways within the company’s internal network and P&G’s existing network of external innovators. This means that P&G at an early stage makes some of its future product areas (and hence aspects of its future strategies) available to the public. The thinking behind these practices is that by informing the external community of innovators about the product areas P&G is working on and in which the company is in need of assistance, the external innovators can more easily assess whether and how they can contribute to P&G’s innovation efforts, which ultimately translates into *a greater number* of attracted ideas and inventions. The openness and transparency in P&G’s innovation process is also intended to increase *the relevance* of the inflow of external ideas and inventions, since the external innovators are given information that helps them identify how, and within which areas, their ideas and inventions might fit into P&G’s innovation process.

---

<sup>73</sup> Staggs (2008).

<sup>74</sup> Brady (2008).

*Attraction: A new driver of learning and innovation*

In addition to this high degree of openness and transparency, P&G has also systematically sought to make the company, and specifically, the Connect + Develop approach to innovation, highly visible. On a macro level, top P&G management have spent considerable time and effort explaining and promoting the nature of its innovation approach to the public. This is manifested in frequent media appearances by CEO A.G. Lafley, director of External Business Development Mark Peterson, and other executives, as well as in an article published in the Harvard Business Review that was written by top P&G managers Larry Huston and Nabil Sakkab, in which they carefully describe P&G's approach to innovation and the role of external innovators.<sup>75</sup> These efforts help to inform a broad audience that P&G is "open for business" for anyone who has a good idea that fits well with the company's strategic objectives, with the intention of compelling external innovators to approach P&G with new ideas and inventions.

In addition to making the firm more visible, the strategy of equating P&G with open and external innovation in people's minds through communication in the media can also be interpreted as the building of *an innovation brand*, wherein the Connect + Develop concept becomes a brand in itself. However, this brand, unlike all of P&G's other brands, is not directed at its customers, but rather at *the community of external innovators*. These attempts to build an innovation brand are reinforced by efforts on a micro level to imbue this brand with certain values of *trustworthiness and dependability*. Larry Huston, former Vice President of Innovation, explains that:

"You want to become the preferred partner to the outside world because, look, if I'm Procter & Gamble, for example, and I turn off a certain group of innovators, the next competitor can pick up those relationships. So, in the end, we're in competition for building these relationships as time goes on. [...] Innovators, they want information. They want transparency. They want quick speed and "get back to me quickly." They want a fair deal. [...] So, you have to really think through, what is your innovation brand? What do you stand for in terms of branding yourself in this global competition for talent?"<sup>76</sup>

This quote further underscores the fact that there is a strong recognition within P&G that, just as there is competition within the product market, there is *competition on the factor market for ideas and inven-*

---

<sup>75</sup> Lafley (2008), Brady (2008), and Huston & Sakkab (2006).

<sup>76</sup> Knowledge@Wharton (2007).

### Chapter 3

tions. Just as P&G employs branding and its reputation as tools for beating its competitors in the product markets, the company works deliberately to build a brand and reputation in order to beat its competitors in the contest to attract the most valuable externally developed ideas and inventions.

#### **Findings and implications: Attraction and external innovation**

Taken together, the findings above illustrate how attraction has become an integral part of P&G's innovation strategy, and how attraction, in concert with internal innovation and external search, contributes to providing the company with the level of innovation it needs to stay ahead in its current markets and to grow by entering new product areas (Penrose 1959, Danneels 2002). In addition, the case study offers insight into how P&G seeks to increase the probability that external actors will identify combinatorial opportunities that involve the company and thereby stimulate the inflow of external ideas and inventions (cf. Kogut & Zander 1992). In the following sections, these findings will be analyzed and discussed in further depth.

#### **Extending the creative space and economizing on innovation-related costs**

As shown in the case description, P&G engages in a number of *attraction-enhancing activities*, such as making aspects of its innovation processes visible to the public, revealing its intentions about future product development, building an innovation brand, and setting up an infrastructure for attracting and evaluating external impulses. Significantly, all of these activities consume resources of different kinds, such as managerial attention and financial resources. Given that substantial resources are committed to stimulating the attraction of external impulses, this raises fundamental questions about how and why P&G can benefit from attraction. Notably, the analysis of the case findings suggests that attraction performs two important functions for P&G that make it worthwhile for the company to allocate resources to attraction-enhancing activities.

First, the study suggests that P&G, by making itself visible and revealing certain aspects of its product development and future strategies, *extends the creative space* in which new combinations between P&G's resources and external resources are identified (cf. Henkel 2006). By informing the external environment about current projects and future intentions, and by "inviting" external actors to contribute

### *Attraction: A new driver of learning and innovation*

to P&G's innovation process, P&G in effect *helps external actors make connections* between their own ideas and resources and P&G's resources and capabilities. This means that such combinatorial opportunities are not only identified from P&G's perspective or vantage point, i.e. "looking out from inside the firm," but also from the perspective of external actors, i.e. "looking into the firm from outside". Conversely, had P&G limited its visibility and opted to keep its innovation processes and strategic intentions secreted away from the outside world (Cohen et al. 2000), only the combinatorial opportunities that are visible from P&G's vantage point would have been identified, since the external actors would largely have been excluded from the creative space in which possible permutations of P&G's resources and external resources are identified. In other words, it is argued here that the attraction-enhancing activities in which P&G engages enable creative connections to be made that otherwise would have been overlooked because they are not readily visible from a vantage point within P&G.

Second, the findings suggest that attraction represents a more economical way for P&G to gain access to external resources and innovation compared to the firm conducting its own search. In effect, the fact that it is the external party that makes the connection and initiates the contact makes the process *less resource-intensive* for P&G, compared to the situation that would exist if the firm itself was solely responsible for identifying possible connections. This means that in addition to the attraction of external impulses that expose P&G to combinatorial opportunities that it otherwise would have overlooked, these attraction processes can also inform the company about potential opportunities for external innovation and resources that the company might have been able to identify on its own, but at a higher cost (Williamson 1991).

#### **Why attraction is particularly valuable for P&G**

As explained earlier, P&G was selected as a case because it represents a company that deliberately leverages attraction and where the inflow of external impulses that the firm attracts is highly valued. This in turn raises the question of what sets P&G apart from most other firms that refrain from engaging in any attraction-enhancing activities and do not draw heavily on the external ideas and inventions that they attract. In response to this question, the case analysis indicates that *the structure of the company's product*

### Chapter 3

*portfolio and customer base* (Delios & Beamish 1999) along with *the structure of its underlying technological portfolio* (Granstrand et al. 1997, Zander 1997) are factors which contribute to explaining why attraction is particularly relevant for P&G. Specifically, the study suggests that *the diversity of P&G's product portfolio* and *the multitude of customers* it serves make it difficult for P&G to remain innovative and informed within all of its product areas, and to be able to continuously anticipate the demands of all its different customer segments. As such, the company is aided significantly by the inflow of ideas and inventions from the external innovators that are specialized within a specific product area or particularly in tune with the needs of certain customer group. These external impulses allow the company to exploit opportunities that it would otherwise have overlooked and enables it to adapt its products to the specific preferences of a multitude of different customer groups.

As noted in the case description, the diversity of P&G's product portfolio also requires a great breadth in terms of its underlying technological capabilities. As further described, harboring all the requisite technologies within the firm is not economical, and hardly even feasible, and the firm hence relies partly on external innovators to provide the underlying technology to many of its products (Chesbrough 2003a, 2006). To be able to utilize external technologies however requires that the firm is able to identify the right external sources of technology, and the case description suggests that certain conditions make this a challenging task for P&G. Identifying relevant external sources of ideas and innovations tends to be challenging for any firm with an externally oriented innovation model, but in certain ways, it is particularly challenging for P&G, since its product portfolio and underlying technological base, as mentioned previously, are both very diverse, which means that the external knowledge that is relevant for P&G's innovation tends to come from many different sources and can be dispersed across different actors, geographical regions and technological fields (Hayek 1945). For example, it is unlikely that the same external actor could support P&G's innovation in product areas as diverse as hair care products, detergents, and snacks, which suggests that the external knowledge pool that P&G tries to tap into is *highly distributed*, making it more difficult to identify relevant sources of external innovation.

As a consequence, it is impossible for P&G to comprehensively search the external environment for technologies. Instead, the firm

### *Attraction: A new driver of learning and innovation*

can only identify a subset of all the technologies that it could have benefitted from. However, by broadcasting information about some of its current projects and future intentions, and thereby help external innovators find P&G, the company becomes informed about a larger share of all relevant externally developed technologies than what it would have been able to identify through its own search processes (cf. Jeppesen & Lakhani 2010). As a result, attraction plays a key role in informing P&G about technologies that it would otherwise have overlooked.

In addition, to these explanations to why P&G can benefit significantly from attracting an inflow of externally developed ideas and inventions, the analysis further suggests that the breadth of P&G's product portfolio and technological capabilities also increase the likelihood that any given impulse indeed can be fruitfully combined with P&G's resources and capabilities. It is argued here that for a company that is narrower in terms of its product portfolio and technological capabilities, there are fewer combinatorial opportunities and hence a lower likelihood that external impulses are of value to the firm, which in turn means that attraction is of less significance to firms with a narrower scope in terms of products and technologies.

#### **Competing in the strategic factor market for ideas**

The case also underscores *the competitive dimension of attraction*. It is acknowledged by P&G managers that the market for ideas and inventions is highly competitive, and that if P&G fails to identify an innovation, a competitor will probably identify it and commercialize it instead. The attraction-enhancing activities in which P&G engages are hence ultimately part of the company's efforts to create and sustain competitive advantage vis-à-vis its competitors, who also seek to identify the most valuable ideas and inventions that are generated amongst the large and diverse community of external innovators (Pierce et al. 2002, Teece 2007). This, in turn, points to the more general finding, previously touched upon, that attraction can be an important means through which companies compete in the strategic factor market for ideas and innovations (Barney 1986, Makadok & Barney 2001).



### 3.2.3 Cross-case analysis of DFJ and P&G

A comparative analysis of DFJ and P&G reveals a number of commonalities, as well as certain differences between the cases, all of which are detailed and discussed in this section, and which lead to both a number of preliminary conclusions about attraction and a number of issues that call for additional attention in the further empirical study.

#### Attraction as a response to widely distributed innovation

First, both cases demonstrate that the firms face an environment in which information, innovation, and thereby valuable opportunities are *widely distributed* (Hayek 1945, Becker 2001, Chesbrough 2003a). As a result of this, in order to be successful, both organizations need not only to reach outside of their own organization, but also to find ways to reach beyond their existing networks and contexts (Rosenkopf & Nerkar 2001). In the case of P&G, the breadth of the company's product portfolio and the range of customers to which the firm seeks to cater render it virtually impossible to internally manage all innovation and associated capabilities. By relying solely on internal R&D and innovation, P&G would severely limit the pool of options from which it can select its future products and strategies (Chesbrough 2003a). The vast range of areas in which P&G is active at the present also renders it impossible for the company to comprehensively search the external innovation landscape and to stay informed about where all the relevant innovation is being created.

This challenge is exacerbated first by the fact that innovation takes place in many different settings, including entrepreneurial ventures, established companies in other industries, independent research institutes, and universities, and secondly by the fact that innovative activity is dispersed geographically across the world (Chesbrough 2006). As a consequence of the vast search space that P&G faces, the study shows that the company is helped significantly by attracting ideas and inventions from external innovators that self-select to approach the company, as this increases its ability to survey the whole of the search space.

In the DFJ case, it was shown that the company faces a situation wherein innovation is widely distributed geographically and across technological sectors, which means that the available investment opportunities are also widely dispersed. For DFJ, the challenge of identifying valuable investment opportunities is redoubled by the firm's

### *Attraction: A new driver of learning and innovation*

strategy of investing in new ventures at the very earliest stages of development, which means that DFJ must be able to connect with start-ups that have limited to non-existent market presence and visibility. As a result, DFJ is, much like P&G, highly reliant on potential candidates for investment to self-select and present themselves to the firm.

In sum, both case studies show that because of the distributed nature of information, innovation, and opportunities, as well as the inherent limitations in their capacity to search, the case companies rely on the assumption that external actors will be attracted to the firm, which serves to inform them about opportunities that they otherwise would have overlooked.

#### **Building attraction and stimulating an inflow of external impulses**

Importantly, for both of these companies, the attraction that they exert on external actors is not merely a spontaneous process that emerges as a by-product of their regular operation, but rather, is a factor that both DFJ and P&G seek deliberately to influence, both in terms of *stimulating the quantity of the inflow* of externally generated impulses and in *shaping the kind of impulses* that are attracted to the firm. Specifically, both companies have sought to *increase the firm's visibility* in order to stimulate the inflow of external impulses. However, the case studies further show that although visibility represents a necessary condition (i.e., if an external actor is unaware of the existence of a focal firm, it will not be attracted to it), it is not a sufficient condition for attraction to occur, and that visibility needs to be associated to quality "content" that makes the firm attractive to external actors.

This is manifested in DFJ's ambition to achieve *a position of leadership in people's perceptions* within interesting arenas of potential investment, an approach that is intended to make DFJ seem like the most attractive partner for new ventures in these fields. It is also reflected in P&G's effort to build *an innovation brand* that is directed at the factor market for innovation and is imbued with certain values intended to position P&G as *the preferred partner* among external innovators. The way in which the two case companies seek to position their respective firms in the minds of external actors further points to the competitive dimension of attraction, in the sense that the ability to attract the right external impulses can be seen as *an organizational capability* that can be an important vehicle through which to outper-

### Chapter 3

form competitors (Eisenhardt & Martin 2000, Teece 2007). In effect, by attracting external impulses that their competitors fail to identify, the case companies gain early access to potentially *valuable opportunities in the strategic factor market*, which is known to be a fundamental source of competitive advantage and supernormal profits (Barney 1986, Makadok & Barney 2001).

Table 3.1 summarizes the concepts that have emerged from the case studies and describes the ways in which the two firms exercise the capability to attract external impulses.

**Table 3.1 Building attraction and stimulating inflow of external impulses**

Concept	Description	Example
Visibility	Being known is a prerequisite for attracting external impulses and being highly visible hence increases the probability that a given firm will be approached by external actors who seek to present it with their ideas and inventions.	DFJ, P&G
Openness and transparency	By disclosing information about its resource base and its future intentions, a focal firm increases the chances that external actors will identify combinatorial opportunities that involve the firm, which increases the likelihood that they will approach it to present their ideas and inventions.	DFJ, P&G
Innovation brand	Having a reputation of being a <i>trustworthy and receptive innovation partner</i> makes external innovators more inclined to approach the firm with their ideas and inventions.	P&G
Leadership in people's perceptions	Establishing a <i>position of leadership in people's perception</i> in a given field increases the chances that external actors choose to approach the firm when they seek to commercialize ideas and inventions related to that field.	DFJ
Identity stretch	By communicating and displaying a strategy and an identity that supersedes its existing core areas, a focal firm can <i>broaden the scope</i> of the inflow of external impulses that it attracts.	DFJ

However, whereas we can identify these key similarities in the activities of the two case companies, certain differences can also be observed with respect to their respective approaches to attraction. A number of differences are reflected in the extent to which the companies seek to shape and control the inflow of external impulses that they attract. Whereas DFJ wants to attract *as much interest from as broad a field of new ventures as possible*, based on the assumption that the chances of attracting the investment opportunities with the largest possible upside are maximized by attracting a large and highly diverse inflow of external impulses, P&G seeks to achieve a *higher*

### *Attraction: A new driver of learning and innovation*

*degree of precision* in their attraction processes. As such, whereas DFJ sends out a broad and open-ended “solicitation,” P&G seeks to specify on its websites and via other communication channels precisely what kinds of ideas and inventions it is looking for and within which specific product areas it is “open for business.” Notably, these differences seem to be reflections of points of divergence in the general strategies of the two companies, where DFJ’s strategy is based on *maximum exploration and variation in outcomes*, and where P&G is set firmly on *the exploitation of its existing capabilities and market positions in existing product areas* (March 1991, Gupta et al. 2006).

★ ★ ★

Altogether, this cross-case analysis of DFJ and P&G reveals a number of preliminary insights about attraction, as well as highlighting certain questions that warrant further study. In particular, the analysis provides additional hints as to the situations in which attraction is relatively more valuable to firms, but also reinforces the previously identified need for additional study of the circumstances under which attraction is more or less valuable and relevant for firms. In addition, the analysis points to ways in which firms can build attraction and stimulate an inflow of external impulses, but also raises questions about which factors make a firm attractive to external actors.

### **3.3 Conclusions and implications for further empirical study**

Altogether, the findings of the pilot studies suggest that attraction at times can inform firms about *different sets of information and opportunities* than can be achieved via internally initiated search. This is manifested in how Yamaha and Apple, through attraction, became exposed to opportunities that their own search had overlooked due to bounded rationality constraints and local search biases (Simon 1955, Cyert & March 1963, Stuart & Podolny 1996). It is also demonstrated by the ways in which DFJ and P&G draw upon attraction in order to become exposed to opportunities that their own innovation and search processes have failed to identify.

Further, the pilot studies show that DFJ and P&G try deliberately to make themselves visible to a large crowd of external actors, and that they also seek to shape the perceptions that the external actors

### Chapter 3

have of the firms in such a way that they will be more inclined to approach DFJ or P&G. However, the study also demonstrated that Apple and Yamaha attracted external impulses without having conducted any attraction-enhancing activities, and that in these cases, the firms' widespread visibility and solid reputations proved to be enough to exert attraction. As such, these examples illustrate that both active and passive firms (with respect to stimulating attraction) can attract external impulses.

Bringing together the findings attained in each of the two parts of the pilot study hence points to a distinction, with respect to attraction, between (i) the instances where a firm receives an unsolicited external impulse, such as occurred in the Yamaha case with the creation of the digital synthesizer and in the Apple case with the development of the iPod, and (ii) the cases where a firm "invites" or solicits external actors to submit ideas and inventions and thereby deliberately contributes to the attraction process, which characterizes P&G's Connect + Develop approach to innovation and DFJ's efforts to attract a vast array of potential investment opportunities.

This in turn suggests that exerting attraction on external actors may be the result of *deliberate efforts and activities* aimed at creating attraction and stimulating an inflow of external ideas and inventions, which is consistent with the findings in the case studies of P&G and DFJ, but that it also can be *a byproduct of a firm's regular operations*, which is consistent with the case studies of the creation of the iPod and the digital synthesizer. These different types of attraction processes with respect to behavior of the recipient firm are further summarized in Table 3.2.

**Table 3.2 Different types of attraction processes**

<i>Type of attraction process</i>	<i>Activity by recipient firm</i>	<i>Type of impulse</i>	<i>Example</i>
Inflow of external impulses as a byproduct of regular operations	Low	Unsolicited	Yamaha (DX7) Apple (iPod)
Inflow of external impulses as the result of deliberate attraction-enhancing activities by the recipient firm	High	Solicited	P&G, DFJ

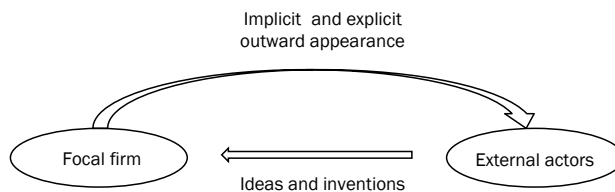
This suggests that in order to understand attraction, one must study the behavior of the focal firm as well as the search, perceptions, and aspirations of actors in their environment that could potentially be

### *Attraction: A new driver of learning and innovation*

attracted to the focal firm, since it is ultimately the external actors who decide whether they will choose to approach the focal firm once they have developed a new idea or invention. In sum, this implies that the attraction that a firm exerts on external actors in its surroundings is a function of: (i) *the deliberate or unconscious ways in which the firm makes itself visible and presents itself to the external environment*, and (ii) *the way the focal firm is perceived and interpreted by external actors and the extent to which these perceptions and interpretations of the focal firm are consistent with the needs and aspirations of the external actors*.

This finding is illustrated graphically in Figure 3.2, which represents a preliminary conceptualization of the fundamental components of the attraction process. The figure illustrates how *a firm's outward appearance*, which may be consciously managed by the firm, is observed and interpreted by external actors, which in turn triggers initiatives among some of these actors as they recognize *combinatorial opportunities* to commercialize their ideas and inventions in cooperation with, or within the boundaries of, the focal firm. This in turn compels them to approach the focal firm and present their ideas, which allows the focal firm becomes exposed to a range of externally developed ideas and inventions.

**Figure 3.2** Preliminary conceptualization of attraction



In addition to these preliminary findings about attraction and this initial conceptualization of what constitutes an attraction process, the pilot study also has implications for the further investigation as it raises a number of questions about attraction which seem to warrant further investigation. First, it identifies a need for *more in-depth in-*

### Chapter 3

*vestigation* of how attraction actually plays out in companies, in terms of developing more detailed descriptions of different types of impulse providers, different types of impulses, the interaction process between impulse providers and recipient firms, and the factors that make a firm attractive to external actors.

Second, even though the pilot study provides illustrations of how the case companies are influenced by attracting external impulses, which allows certain preliminary conclusions to be drawn, it also suggests that further study is needed in order to provide well-founded answers to the general question of *how attraction affects firms*.

Third, the pilot study provides certain tentative information about the conditions under which attraction is relatively more valuable and useful to firms; it for instance suggests that P&G's diverse product portfolio makes the inflow of externally developed ideas and inventions more valuable to the company. However, because of the sampling of the cases, which are either "success cases" (the iPod and the DX7) or extreme cases where attraction and the external inflow of ideas are particularly important (DFJ and P&G), it is difficult to make inferences based on the pilot study of the factors that determine when attraction is relatively more important to firms. Consequently, the findings of the pilot study point to the need for more in-depth study of *the conditions under which the attraction of external ideas and inventions is relatively more important to firms*.

In the following section, these general questions raised by the pilot study will be discussed in relation to the previously established purpose of the study in order to formulate the specific research questions that will guide the further empirical inquiry.

### 3.4 Purpose and research questions

As outlined in the previous chapters, the general theme of the study revolves around the question of how established firms can sustain and renew the basis of their competitive advantage over time (Teece 2007), and the novel concept that has been introduced in order to shed additional light on this issue is attraction. In line with this, the purpose of the study is to investigate attraction and thereby offer an alternative perspective on how firms explore opportunities and discover non-local ideas and innovations, in order to further our understanding of how firms can sustain and renew their competitive

*Attraction: A new driver of learning and innovation*

advantage over time through learning and innovation. As part of this ambition, the study also aims to outline how attraction differs from search-based exploration mechanisms that have been identified in the extant literature.

As explicated in the previous chapter, the specific research gap that is targeted in this study is the pronounced lack of empirical work addressing the role of *external strategic initiatives* from outside firms' existing customer and supplier networks for their learning, innovation, and strategy creation, along with the lack of conceptual work pertaining to *attraction* as a way to become informed about new ideas and inventions. As was presented earlier, a pilot study was undertaken in order to assess this approach, to gain some preliminary findings, and to hone the formulation of the research questions. As was shown in the previous section, based on the findings of the pilot study it could be concluded that because attraction represents an under-researched phenomenon in this context and because of certain limitations in the design of the pilot studies, there is a remaining need for a *more thorough description of attraction as an empirical phenomenon*.

More precisely, there is a call for more careful description of how attraction plays out in companies in terms of the processes through which recipient firms and impulse providers interact with each other, the different types of impulses that firms attract, and the factors that make firms attractive to external innovators. I argue that such description would provide a more thorough understanding of the attraction phenomenon as such and thereby also provide a solid foundation for further conceptualization. In response to this reasoning and the need for more in-depth description of attraction, the first research question is formulated as:

- 1. How does attraction work and what are the factors that make firms attractive to external innovators?*

Notably, this question is deliberately formulated in a simple and open manner in order to leave room for unanticipated findings and conclusions to emerge from the empirical investigation, in accordance with the inductive logic that characterizes the study (Corbin & Strauss 2008).

Second, the pilot studies suggest that the role and significance of attraction relative to previously described search-based exploration



### Chapter 3

mechanisms is contingent upon of a number of factors, and that it appears to be more valuable and relevant in certain contexts than in others. For instance, the study suggests that the type of product area and the structure of a firm's product portfolio is one such determinant, where P&G's fragmented product portfolio, for instance, renders the company particularly dependent on attracting external impulses. The pilot study also tentatively suggests that certain contextual factors such as the degree of turbulence and complexity in the industry is another such determinant (Dess & Beard 1984, Lane & Maxfield 1996). I argue that the identification of the conditions under which attraction is relatively more valuable to firms is important because it would specify *the boundary conditions* that determine when a theory of attraction is applicable. Based on this reasoning, the second research question is formulated as:

2. *In what contexts and under what conditions is attraction important for firms?*

Third, the study also sets out to investigate how firms are affected by attracting externally developed ideas and inventions. The findings of the pilot study seem to indicate that the attraction of externally developed ideas and inventions can indeed have substantial positive consequences for firms. Specifically, the pilot studies demonstrated that the attraction of ideas and inventions can broaden a firm's "vision" and thereby alleviate some of problems associated with local search biases and ingrained knowledge structures (Cyert & March 1963, Levinthal & March 1993, Barr et al. 1992, Tripsas & Gavetti 2000). This in turn seemed to affect the case companies on different levels and in different ways, including stimulating product-level innovation, such as in P&G (Danneels 2002, Katila & Ahuja 2002), supporting learning by infusing novel perspectives into the existing knowledge structures of managers in firms, as demonstrated by the studies of Yamaha and DFJ (Barr et al. 1992, Tripsas & Gavetti 2000), and ultimately, supporting the creation of new corporate strategies, as shown by the description of Apple's entry into the digital music sphere (Burgelman 1991, Regnér 2003).

However, even though the case studies support the notion that attraction can have significant consequences for firms, the findings of the pilot study are, as emphasized earlier, still preliminary. This means that in order to be able to draw well-founded conclusions

### *Attraction: A new driver of learning and innovation*

about the relationship between attraction and these outcomes, further and more detailed studies are needed. In response to this reasoning, the second research question is formulated as:

#### *3. How does attraction influence learning, innovation, and strategy creation in firms?*

Finally, it is important to note that attraction, obviously, is not the only mechanism that drives learning, innovation, and strategy creation in firms. Multiple mechanisms that are built on the focal firm's own search activities such as R&D (Baumol 2002), internal strategic initiatives (Burgelman 1983b), strategic planning (Ansoff 1980), and environmental scanning (Hambrick 1982) are also known to support learning, innovation, and strategy creation. The findings of the pilot studies, however, tentatively suggest that there are certain systematic differences between attraction and the previously described search-based exploration mechanisms. In particular, the findings indicate that attraction can be a powerful vehicle for reaching beyond one's existing context and that it can allow for more far-reaching exploration than what could be achieved through the firm's own search activities (Rosenkopf & Nerkar 2001, Rosenkopf & Almeida 2003). Consequently, I argue that whereas the answer to the third research question is expected to be of interest in itself, it achieves particular relevance when attraction is compared to search-based exploration mechanisms. Hence, the fourth and final research question focuses on the *distinctly unique* attributes of attraction and is formulated as:

#### *4. How does attraction differ from search?*

Taken together, these questions will guide the further empirical inquiry, and I anticipate that they will allow me to fulfill the purpose that was initially set forth for the study, which is to investigate attraction and thereby offer an alternative perspective on how firms explore new opportunities and discover non-local ideas and innovations, in order to further our understanding of how firms can sustain and renew their competitive advantage over time through learning and innovation. These research questions will also enable me to outline how attraction differs from search-based exploration mechanisms that have been identified in the extant literature.

## Chapter 3

★ ★ ★

After having established the purpose of the study and the specific research questions that will guide the study, the research design and method of the empirical study will be presented in the following chapter. To provide guidance for further reading, Table 3.3 outlines the chapters in which each of the research questions are directly addressed.

**Table 3.3** The treatment of the research questions

<i>Research Question</i>	<i>Addressed in chapter</i>
1. How does attraction work and what are the factors that make firms attractive to external innovators?	5, 6
2. In what contexts and under what conditions is attraction important for firms?	5, 6,
3. How does attraction influence learning, innovation, and strategy creation in firms?	5, 6, 7
4. How does attraction differ from search?	7



## Chapter 4

### Research design and methodology

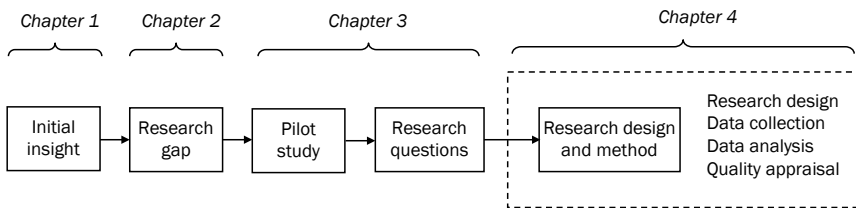
As was concluded in the previous chapters, attraction as a concept, as well as the empirical phenomenon of the inflow of externally developed ideas and inventions into established firms, both represent a significant – and largely unexplored -- aspect of the broader issues of learning, innovation, and the renewal of competitive advantage. As a result of the lack of empirical antecedents, the current investigation is *exploratory* in nature, with a primary aim to provide *an in-depth description and understanding of the empirical phenomenon* (Stebbins 2001). Further, in response to the lack of existing conceptual frameworks related to attraction, this study aims to *develop the concept of attraction and to build theory around this concept based on the empirical findings* (Strauss & Corbin 1990). Consequently, the approach of the study can be formulated as “bringing up an underemphasized aspect of a broader research problem, and systematically study[ing] it ... [to] build theory around it through an inductive logic” (King et al. 1994, pp. 17).

The research process underpinning this study has largely followed the pattern described by Glaser & Strauss (1967: 251) with *an initial insight serving as a springboard into systematic theorizing* (cf. Langley 1999). The initial insight that firms are not only active searchers, but also attract external impulses, and that firms can hence be analyzed as “magnets,” provided the starting point for the study. In response to the lack of obvious empirical and theoretical antecedents, the ensuing empirical investigation was conducted in a stepwise manner.

*Attraction: A new driver of learning and innovation*

As shown in Figure 4.1, the initial insight was followed by an analytical review of extant literature and the determination that a research gap did in fact exist in this area. This was then addressed in the pilot studies, which constituted the first stage of the empirical investigation; the results of which were reported in the previous chapter. The pilot studies played a pivotal role in the investigation as a whole by motivating the further study of the phenomenon and by strengthening the conceptual underpinnings of the study. In addition, the findings of the pilot studies allowed more precise research questions to be formulated, in accordance with Mintzberg's (1979) and Suddaby's (2006) recommendation that theory-building studies should be guided by carefully formulated research questions.

**Figure 4.1** The research process and structure of Chapter 4



The outcome of the pilot studies and the associated research questions then provided the foundation for the formulation of the research design of the second stage of the empirical inquiry, the main study. As such, in this chapter, I present and elaborate upon the research design of the main study, along with the methods used for data collection and data analysis. The chapter is, as shown in Figure 4.1, structured according to the following outline: (i) research design (ii) data collection, (iii) data analysis, and (iv) quality and validity appraisal.

## 4.1 Research design

The selection of a suitable research design provides the logical structure to a study and sets the boundaries for what knowledge can be obtained from the study (de Vaus 2001). As such, the research design needs to be carefully matched to the research questions and to the nature of study in order to allow the researcher to make descriptive and/or causal inferences as unambiguously as possible about the research questions (King et al. 1994). In response to this imperative, the following sections will focus on describing the various features of the study's research design in relation to the research questions.

### 4.1.1 A case study approach

In the section discussing the motivation for the research design of the pilot study, I argue, based on the lack of empirical antecedents and clearly defined concepts, along with the fact that the research questions deal with complicated interactions in social systems, that a *case study approach* would be an appropriate research strategy (Yin 1989). As shown by the previous chapter, the multiple-case-study approach that was employed in the pilot study provided a first step towards describing the phenomenon and further developing the attraction concept. However, as was apparent from the reporting of the findings, the results are still preliminary and many questions remain unanswered, which suggests that the arguments in favor of a case study approach still seem to remain valid for the second part of the empirical inquiry. In effect, I argue that a more *in-depth* case study approach can remedy some of the shortcomings of the design used in the pilot study and hence can complement and extend the findings of that study. Specifically, I suggest that an in-depth case study approach based on *first-hand information gleaned from the people directly involved in attraction processes* would enable me to provide a more accurate description of the phenomenon than the pilot study allowed, due to its reliance upon secondary data.

This approach to building theory in unexplored areas based on a case study design is well established in the literature, and the methodology has also been the focus of renewed interest in recent years, as reflected in the analyses by Siggelkow (2007), Weick (2007), and Gibbert et al. (2008). A review of the literature also reveals that previous studies investigating similar issues have also employed case

study methodologies. Previous studies in related areas that adopted a similar methodology include Burgelman's (1983a) study of internal corporate venturing, Regnér's (2003) study of strategy creation in established firms, and Gavetti & Rivkin's (2007) study of the origins of strategies in firms.

Based on the outstanding questions remaining from the pilot study and the continued need for careful description of the empirical phenomenon as the basis for further conceptual development, along with the established track record of the method being used in previous work addressing similar topics, it has hence been determined that the study will employ a case study approach for the second part of the empirical inquiry, as well. Subsequent sections will discuss the specific features of the case study in terms of the number of cases, case selection processes, types of data, and units of analysis. However, before delving into the specifics of the research design, an alternative research strategy that was also considered at one point will be briefly discussed.

#### **4.1.2 Alternative research approaches**

The research questions that form the basis of the current study do not per se rule out the possibility of quantifying the variables and employing a deductive approach based on hypothesis testing. In fact, at one point in the preliminary research process, the possibility of complementing the case studies with a quantitative study based on a large sample survey was considered. After consideration, however, it was determined that such an effort would be premature, since the area is still conceptually fuzzy and as such, there are *no clearly defined variables*. Along these same lines, it was further perceived that trying to quantify the concepts without knowing more about the variables and the specifics of the ways in which the attraction mechanism plays out in real-world settings could cast doubts on the construct validity of the study by risking the omission of important variables or failing to test for the right relationships (Gibbert et al. 2008). For these reasons, it was concluded that the attraction framework is still in a transitional state from which it needs to be *developed, extended, and enriched*, rather than *validated or falsified* through quantitative hypotheses testing, and as such, that a more appropriate approach at this stage would be a case study approach that would allow for the development of concepts and variables, and



for the generation of propositions about how these relate to one another. At the same time, however, it is important to note that the current analysis is being conducted with the assumption that future studies will address this area using different methods, including potentially quantifying the variables that are identified in this study and testing the relationships between the variables.

#### **4.1.3 The research design: A multiple comparative case study approach**

The most significant decision concerning the specifics of the research design is whether to choose *a single-case study design* or *a multiple-case study design*. Whereas both single-case studies (Burgelman 1991, Siggelkow 2001, Gavetti & Rivkin 2007) and multiple-case studies (Regnér 2003, Miller 2004) have been used in the past in similar investigations, several factors support the use of a multiple case design for the current study. First, in accordance with Yin's (1989) argument that multiple case studies constitute a more robust foundation for theory building, as they follow *a logic of replication* whereby the multiple cases serve as replications, contrasts, and extensions to the emerging theory, there is reason to believe that studying several cases would create a fuller and more detailed answer to both the first research question, which asks how attraction works, and the third research question, which asks how firms are influenced by attracting external ideas and inventions.

By contrast, relying on a single case could create a significant risk of providing a limited and biased view of the phenomenon, leading one to draw general conclusions based on the idiosyncrasies of a single firm or actor (Eisenhardt & Graebner 2007). Second, in order to answer the second research question, which seeks to define the conditions under which the attraction of external ideas and inventions is important for firms, it is necessary to be able to make comparisons between several companies, as causal inferences cannot be made without studying multiple companies that differ in terms of how significant attraction is to each of them (King et al. 1994). As such, after carefully considering the research questions set forth in the current study and the general recommendations offered in the methodology literature, a multiple case-study design was selected.

Previous work based on multiple-case-study designs shows that a significant degree of variation exists with respect to the number of cases selected for inclusion. For example, Barr et al. (1992) focus on

*Attraction: A new driver of learning and innovation*

two cases, Regnér (2003) studies four companies, and Eisenhardt (1989b) studies eight companies. This variation suggests that there are no clear-cut rules about how many cases should be selected and that this methodological question remains a matter of individual judgment, as suggested by Yin (1989). In this case, when choosing the number of cases, different factors had to be weighed. Given resource constraints, the underlying *trade-off between internal and external validity* was a major consideration (de Vaus 2001).

On one hand, there is reason to believe that attraction will play out differently in different settings and that there is, therefore, a compelling reason to study several different cases in order to capture this variation, since studying too few cases could result in overlooking significant aspects of attraction, forcing the investigator to draw general conclusions based on the idiosyncrasies of individual cases, which could in turn limit the external validity of the study (Gibbert et al. 2008). Therefore, focusing on a large number of cases would seem to be preferable. On the other hand, a fundamental advantage of case study research is that the limited number of targets allows the researcher to gain an in-depth, detailed understanding of the individual cases, which in turn leads to more accurate descriptions and provides a solid foundation for theory building (Merriam 2002). Selecting a large number of case companies might cause the researcher to be “spread too thinly” and hence unable to acquire the requisite level of in-depth knowledge about each case, thereby reducing the high degree of internal validity that is one of the major methodological strengths of case study research (Siggelkow 2007).

As such, when deciding upon the number of cases, a balance had to be struck between the advantages of a larger sample and the advantages of in-depth description, which is more realistically attainable with smaller samples. Taking this trade-off into consideration, the decision was made to select three cases for the main study, a number that would allow each case to be analyzed thoroughly while still reducing the risk that the findings would merely reflect the idiosyncratic properties of a particular company. Significantly, the choice of studying three cases in the second stage of the study was also influenced by the fact that it had been preceded by the pilot study where four other cases had been studied. This helped to lessen possible concerns that three cases might be too small a sample, as these findings could be compared to and verified against the findings of the four pilot cases in the later stages of the analysis.

#### 4.1.4 Selection of case companies

An initial methodological consideration was whether to select comparable companies from the same industry, in a manner similar to the methodology used by Eisenhardt (1989b), or to select case companies from different industries in order to enable cross-industry comparisons, as described by Miller (2004). Selecting firms from different industries would have the advantage of capturing more of the variation in the ways that attraction plays out in different settings. In addition, this approach would enable a comparison between different industries, which in turn would allow inferences to be made with regards to the second research question, which asks under what conditions and in what contexts the attraction of external impulses is important for firms. On the other hand, the disadvantage of comparing firms from different industries is that this approach would not provide any basis for linking the attraction of external ideas and inventions to performance outcomes, since the differences in industries would render such inferences problematic (King et al. 1994). In contrast, comparing firms within the same industry would allow for such inferences, such as by assessing how different firms rated on certain attraction-related measures (such as the number, type, and utilization of attracted impulses) and how this corresponded to their innovation performance.

When weighing these factors against each other, it was ultimately determined to be more important to be able to gain a broad-based understanding of the ways in which attraction plays out in different settings, as well as to be able to answer questions about the conditions under which the inflow of external impulses is relatively more important. Consequently, in accordance with Miller (2004) and Regnér (2003), companies from different industries were selected as case studies.

Several factors guided the selection of the companies included in the study. Unlike the sampling method employed in the pilot study, the three case companies used in the main study were not selected on the basis that attraction could be expected to be particularly important for these companies or in their respective industries. Instead, the reason for selecting companies without any a priori expectation of the degree of importance of the inflow of external impulses was the ambition to be able to make broader generalizations that would apply to all established firms, and not just to the subset of firms in which

*Attraction: A new driver of learning and innovation*

the attraction mechanism is deliberately leveraged. Obviously, the sample is too small to satisfy any criteria of random statistical sampling, but compared to the alternative of sampling cases in which the attraction mechanism could be expected a priori to be particularly salient, as in the pilot study, I contend that this approach to case selection limits the risk that the study represents only the idiosyncrasies of a number of outliers. This sampling method was also employed to create a degree of complementarity between the case selection of the pilot study, in which two extreme cases, P&G and DFJ, were studied, and the main study, in which companies without any explicit ambitions of attracting external ideas and inventions were studied.

Based on these considerations, three companies in *different industries* were selected. In order to achieve a greater degree of variation in terms of the industry conditions, one of Dess & Beard's (1984) dimensions of organizational task environments was employed, as cases were selected both from mature and relatively stable industries, and from dynamic and turbulent industries, which are characterized by a high degree of complexity and uncertainty. This was also consistent with the findings of pilot studies which indicated that the complexity of the strategic context is of significance when studying attraction.

Hence, two cases from mature industries were selected, namely, automotive safety system producer Autoliv and milking systems manufacturer DeLaval, and one case from a high complexity environment was selected, namely, Ericsson Multimedia, which is one of three business units of Swedish telecom equipment manufacturer Ericsson. The choice of Ericsson Multimedia was guided by the fact that the business unit as such was created in order to enable Ericsson to compete in the emerging field where the telecom, IT, and media industries are converging, which represents an extremely turbulent and complex strategic environment. Notably, the case companies are of different sizes in absolute terms, but they are all regarded as large within the contexts of their respective industries, in which all three assume leading roles.

## Chapter 4

**Table 4.1 Descriptions of the case companies**

<i>Company</i>	<i>Industry</i>	<i>Turnover Million USD 2008</i>	<i>Employees 2008</i>	<i>Headquarter location</i>
Autoliv	Automotive safety systems	6 473	34 000	Stockholm, Sweden
DeLaval	Milking equipment	1 400	4 700	Tumba, Sweden
Ericsson	Telecom equipment	29 847	78 740	Stockholm, Sweden

As shown in Table 4.1, which presents basic background information about the selected companies, all of the case companies are Swedish, which is a choice that reflects the need to achieve close access to companies and managers in order to gain a deep and multifaceted understanding of the role that the attraction of external ideas and inventions plays for the companies (Easterby-Smith et al. 2002). This need for close access was established during the course of the pilot studies, where it was found that whereas certain aspect of attraction could be studied based on secondary data, other, more subtle, aspects of attraction could not be explored without close access. Specifically, it was perceived that in-depth studies based on interaction with the people directly involved in the attraction processes would be necessary in order to produce reliable findings and to formulate confident conclusions about how attraction works and how firms are affected by the inflow of external impulses that they attract.

Significantly, Swedish companies have a tradition of being open to external researchers and are therefore often regarded as highly suitable case companies in this type of study.<sup>77</sup> Being Swedish myself, it also proved easier to negotiate access with Swedish firms compared with firms in other countries, such as in the U.S., where certain efforts were also made to negotiate access, but where it ultimately proved to be much more difficult to do so. However, in spite of the benefits associated with ready access to the case companies, the selection of Swedish companies can be argued to carry with it certain disadvantages, as well, as it creates the risk that the findings may reflect features that are particular to Swedish companies, rather than the broader population of firms in general, which might raise questions about the study's generalizability. Although this potential problem is acknowledged, I contend that it to some extent is ameliorated

<sup>77</sup> For previous examples, see Hagström (1991), Ridderstråle (1996), and Regné (1999).

### *Attraction: A new driver of learning and innovation*

by the use of American case companies in the pilot study, which constitutes a form of replication of the study in a different context, the results of which show that the phenomenon as such is not idiosyncratic to Swedish firms.

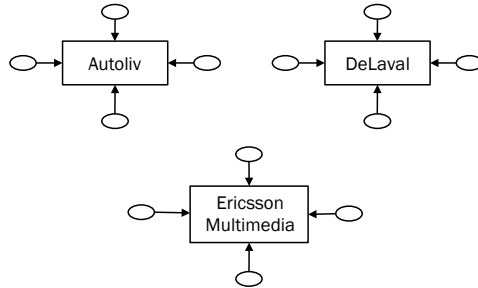
#### **4.1.5 The case companies as focal points for external innovators**

An essential premise of this study is that the inflow of externally developed ideas and inventions that companies attract is determined by the actions and decisions of external innovators, in the sense that it is ultimately they who decide if they will approach a focal firm with their new ideas or inventions. A consequence of this for the research design of the study is that it is not sufficient to study the three case companies in isolation, since the attraction that they exert rests ultimately in the eyes of the beholder, so to speak, i.e., the potential providers of ideas and inventions. Consequently, this study adopts *a dual research design* by focusing on both the three case companies and external innovators in the environment around the case companies.

On a practical level, this means that in addition to in-depth studies of the case companies undertaken to investigate how they are affected by the external inflow of ideas, external actors that are actual or potential providers of ideas and inventions are also investigated, with the aim of identifying the factors that makes a firm attractive in the eyes of external innovators and hence shape the inflow of ideas and inventions that the firm attracts. The external innovators are studied with a specific focus on how they act when they seek to commercialize a new idea or invention, under what circumstances they present their ideas to other companies, and how they select among different alternatives when they need a partner to commercialize a new idea or invention. This part of the investigation also included questioning external actors about their perceptions of the focal case company, their possible previous experiences of “pitching” ideas to that company, and the ways in which they would consider approaching it to present new ideas or inventions in the future. Figure 4.2 illustrates how the case companies constitute *the focal points* for the study, but that external actors in their environment also figured in the research design.

## Chapter 4

Figure 4.2 The case companies as focal points for external innovators



### 4.1.6 Unit of analysis: A multi-level study

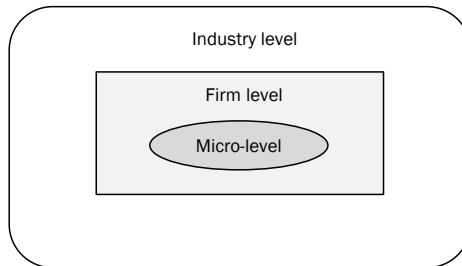
In order to address the research questions and to provide as complete a description of the phenomenon as possible, the case studies were conducted at multiple levels, an approach that Yin (1989) refers to as *an embedded case study*. This embedded design, which is advocated by Pettigrew (1992) and has previously been used in a similar study by Bourgeois & Eisenhardt (1988), increased the complexity of the study, but allowed for more richness and depth of detail in describing and explaining the phenomenon. As shown by Figure 4.3, the investigation was conducted at three levels: (i) the industry level, (ii) the firm level, and (iii) the micro-level of the individual attraction process. The logic behind this tripartite analytical model is as follows.

First, the industry-level analysis provides an understanding for *the outer context*, in terms of the economic and competitive environment in which the firms are located and hence in which the attraction processes take place (Pettigrew 1992). The nature of the outer context specifically has implications for the identification of the conditions under which the attraction of external impulses is important for the firm, as well as for how the industry -- and a firm's position within that industry -- influences its propensity to attract external impulses. Second, the firm-level analysis was used to create a general understanding for *the inner contexts* of the case companies in terms of the ways in which innovation and strategy development are conducted within the companies, and a specific understanding for how these processes are influenced by the attraction of external ideas and inventions. Third, the micro-level study of individual attraction

### *Attraction: A new driver of learning and innovation*

processes was intended to provide *in-depth, detailed information about the processes through which external impulses influence the case companies*. Importantly, in accordance with the logic of an embedded study and the ambition of gaining a holistic and contextualized understanding of the phenomenon, particular emphasis in the case analyses was placed on the interaction between the industry-level dynamics, the firm-level context, and the micro-level processes (Pettigrew 1990).

**Figure 4.3 A multi-level case study approach**



#### **The micro-level study of specific attraction processes**

The final level of analysis, referred to as micro-level case studies, was performed by selecting and studying one specific example of a process inside each case company in which an externally developed idea or invention had played a significant role in the development of the new product or service. These micro-level case studies represented extensions of the first part of the pilot study (i.e., Yamaha and Apple), with the important difference that they were built on first-hand information gleaned from the people who were directly involved in the processes, which allowed for a more comprehensive understanding of the details of the processes and the mechanisms involved.

The processes to be analyzed were selected after discussions with senior R&D managers in the respective companies and were based on the logic of theoretical sampling, as these were intended to be regarded as illustrative rather than typical examples (Siggelkow 2007).



## Chapter 4

In the DeLaval case, the development of a new product area for on-farm milk analysis instruments was studied; in the case of Autoliv, the development of a new system to protect against whiplash injuries was studied; and in the case of Ericsson Multimedia, the development of a new set of IPTV services was investigated. A central criterion for the selection of these specific processes was that the key people involved in the attraction and development process, including both the impulse providers and key personnel in the recipient firms, could be interviewed. This was considered vital, as it allowed access to first-hand information from the people who had been driving these processes and possessed general insight into the process that led to the development of the new products, as well as specific understanding of the role of the external impulse. Interviewing both the impulse providers and the personnel in the recipient firms was also considered to be important as it allowed the accounts of the respective actors to be compared and critically assessed, which is in accordance with the recommendations of Miller et al. (1997) to maintain a critical perspective vis-à-vis one's sources (cf. Golden 1997).

As in the pilot study, the micro-level case studies were studied retrospectively (Golden 1992). An alternative to this retrospective design that was considered at one point was to study such processes longitudinally in real time instead, which would have had the benefit of minimizing the risk of people rationalizing, forgetting or exaggerating their own importance, risks that can compromise the validity of the study (Huber & Power 1985, Miller et al. 1997). The prospect of following the cases in real time through observations, however, also had a number of disadvantages.

First, the time frames of the processes that are being studied would be problematic, as it can take several years from the initial contact to the launching of a commercial product. From a resource-utilization perspective, this extended duration makes it difficult to study the phenomenon in real time. In particular, it would be difficult to make inferences about outcomes, as these often cannot be fully evaluated until years after the initial contact has been established.

Second, it is doubtful whether sufficient access would have been granted, given that the processes through which new products are developed are often deemed to be sensitive, compelling involved parties to keep many aspects of them secret until the resultant products are ready to be launched on the market. Based on these considerations, it was determined that the advantages of the retrospective me-

thod outweighed the disadvantages, as the full processes and outcomes could be more readily observed and because the time that had elapsed since the product launch date would allow the people involved to discuss the situation more freely (Miller et al. 1997). The risk of relying on biased accounts was considered to be rendered manageable by collecting the reports of multiple respondents and, when possible, by using other data sources *to triangulate and verify the accounts of the respondents* (Huber & Power 1985, Mathisen 1988). This and other issues pertaining to the data sources used in the study are further discussed in the next section.

#### **4.1.7 Types of data**

Case study research in general is characterized by its flexibility with respect to data collection, as it allows for the use of different types of data simultaneously (de Vaus 2001, Eisenhardt & Graebner 2007). Indeed, it is commonly recommended that researchers combine different types of data in the same study in order to triangulate the findings and strengthen the concept validity of the study (Yin, 1989, Gibbert et al. 2008). This study adopts such an approach, combining *primary data* from interviews with managers of the case companies and external innovators around the case companies with *secondary data* in the form of documents and other archival material; this is an approach that has frequently been used in the past in previous studies investigating related topics, such as in Regnér's (2003) and Gavetti & Rivkin's (2007) studies of how firms create new strategies.

The decision to use interviews as the study's main data source follows the example set by Brown & Eisenhardt (1997) and reflects the above-mentioned ambition of gaining access to *first-hand information* from people who are involved in attraction processes. Specifically, in order to gain an understanding of the ways in which the inflow of external ideas and inventions affect the case companies, it was considered vital to talk to the people within the companies who are involved in evaluating such external impulses and integrating these impulses with the innovation and strategy development processes that are at work within the firms. Further, in order to gain an understanding of the factors that make a firm attractive and shape the inflow of external ideas and inventions, it was deemed to be instrumental to talk to external innovators about how they choose to

## Chapter 4

commercialize new ideas and the factors that shape their preferences of partners with whom to cooperate in the commercialization process. The use of secondary data, on the other hand, reflects an effort to *triangulate the findings* by seeking to corroborate accounts provided by respondents during interviews (Mathisen 1988, Miller et al. 1997). This process has included reviewing documentation such as industry reports, previous academic studies about the case companies and their respective industries, and articles in the business press about the companies. In addition, internal documents which outline the innovation process inside the case companies have been analyzed. This has made it possible to critically assess the statements of the respondents based on external analyses provided by academic researchers and industry experts. The necessity of critically assessing the statements of informants has been emphasized in the previous literature, which notes that respondents may engage in *impression management tactics* or, more simply, may have *inaccurate perceptions of the subject matter* (Golden 1992, 1997).

Especially for the micro-level case studies that focused on particular attraction processes, the use of secondary data was an important feature, since this part of the study is retrospective, meaning that there is reason to take a critical stance to the information provided by one's sources, as the accounts of the respondents may be subject to *hindsight biases* (Huber & Power 1985, Miller et al. 1997). In the DeLaval and Autoliv cases, key patents and contemporary newspaper accounts were accessed and reviewed, which provided data that were produced at the time that these events occurred and hence were not subject to hindsight biases. This proved to be particularly important in these cases, due to the substantial amount of time that had elapsed since both the DeLaval and Autoliv processes were initiated. Unfortunately, no such documents could be retrieved in the Ericsson Multimedia micro-level case studies, and the problem of hindsight biases had to be addressed solely by comparing the accounts of the respondents within the case companies against the accounts of the impulse providers.

Having argued for the importance of accessing first-hand information from the people directly involved and using multiple data collection methods in order to triangulate the findings, an important question that remains is why these two data sources were the only collection methods used and, in particular, why *observation* was not used as a method, since this is widely regarded as perhaps the most

### *Attraction: A new driver of learning and innovation*

accurate method by which to obtain in-depth, first-hand information (Marshall & Rossman 2006). Using observational methods to gather information during meetings between the managers of the case companies and external innovators and to study the interactions between the two parties would no doubt have been a valuable addition to the study. Unfortunately, and as indicated earlier, such access could not be negotiated with the case companies, due in large part to the sensitive nature of the issues that are discussed in such meetings. Instead, arranging interviews with multiple respondents within the case companies, as well as with key external innovators, emerged as the best alternative method through which to gain significant access.

#### **4.1.8 Selection of respondents**

Given the central role of interviews in the research design, a key issue for the quality of the data was *finding the right respondents*. Early interviews indicated that R&D and business development are the key functions within companies with respect to attraction and the adoption of external ideas and inventions, since it is generally managers within R&D departments and business development functions who meet with external impulse providers. The interviews further suggested that even in those instances where external actors approach firm personnel in other roles within the case companies, they tend to be transferred to these departments, because it is typically within R&D and business development where decisions can be made about adopting external impulses and allocating resources to their further development. As such, in response to these early findings, the study focused on those personnel most involved and also most influential with respect to externally developed ideas and inventions, which means that the respondents were selected primarily from among managers within R&D and business development departments.

Within these areas of the organizations, I sought to interview people on *different hierarchical levels* in order to gain a more complete picture of how attraction plays out in the case companies, which is also in accordance with Eisenhardt & Graebner's (2007) recommendations about how to improve the validity of a case study. In each company, one of the top R&D managers was interviewed in order to receive a comprehensive organizational overview from someone with an in-depth understanding of all R&D activity within the company. In addition, lower-level managers working within R&D and business de-

## Chapter 4

velopment were interviewed in order to get their perspective on the inflow of external ideas and inventions.<sup>78</sup> In terms of determining the total number of managers interviewed, Eisenhardt's (1989a) criterion of *theoretical saturation* was employed, meaning that in each case company, additional managers were contacted and interviewed until subsequent interviews did not reveal additional information.

Further, as described previously, in addition to the direct studies of the case companies, external innovators in the environment around the case companies were also investigated. These external innovators were either firms or independent inventors, and they were selected on the basis that they were *existing or potential providers of new ideas or other innovative input* to one of the case companies. In each of these firms, at least one manager was interviewed, and the respondents were typically the CEO of the company. Different paths were taken to identify these external innovators. First, the interviews with the managers of the case companies helped identify such actors in their external environment, pointing me towards companies or inventors which in the past had approached them with new ideas or inventions. Second, the introductory interviews with industry experts also helped me identify external respondents. Third, each external respondent could typically suggest at least one more such company or inventor.

★ ★ ★

In sum, it is argued that this selection of a combination of key personnel inside the case companies and external innovators allowed me to interact with respondents that were highly knowledgeable about the subject matter and hence could provide pertinent information. It is further suggested that the use of *multiple respondents on different hierarchical levels* within the case companies, as well as a varied mix of both *internal and external respondents*, allowed me to verify the accounts of the respondents and thereby to reduce potential biases due to retrospective sensemaking or impression management strategies by the respondents (Golden 1992, Eisenhardt & Graebner 2007).

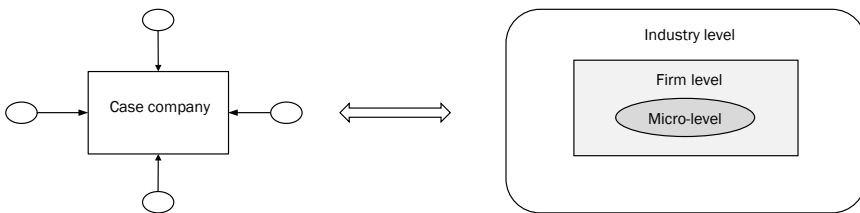
---

<sup>78</sup> As the study progressed, I realized that in certain product areas in the DeLaval organization, adoption decisions can be made without the involvement of the R&D or business development departments. In response to this finding, two line managers were also interviewed in order to get their perspectives on the impact of external ideas and inventions on product development within their respective product areas.

#### **4.1.9 Summary: The design of the study and how the research questions are answered**

As shown by Figure 4.4, the current study is designed as a *multi-level case study with a dual focus on both the case companies and external innovators in the environment around them*. This design has been chosen in response to the research questions that guide the study, and the points of correspondence between the features of the research design and the research questions are summarized in Table 4.2.

**Figure 4.4** The research design



The study of the first research question, which seeks to outline how attraction works and what the factors are that make firms attractive to external actors, draws upon both *industry-level analyses* and *firm-level analyses*. This is due to the fact that the variables that drive attraction and can influence a firm's propensity to attract external impulses can be found in the specific properties of a firm, such as its resources and capabilities, as well its position within the broader industry structure. This part of the study draws substantially on the investigations of external innovators, since it is they who ultimately decide whether to approach the case companies with new ideas or inventions, and it is these decision-making processes that determine the extent and nature of the external inflow that the case companies attract.

The study of the second research question, which seeks to identify the conditions under which attraction is relatively more important, involves data drawn from both *the firm-level analyses* and *the industry-level analyses*. This approach reflects the findings of the pilot study, which suggested that the importance of attraction is deter-

## Chapter 4

mined by properties of both the industry and the firm itself. This part of the study is mainly based on the internal investigations of the case companies, since it is within those that it can be assessed how important attraction is and what the factors that most influence this process are.

The approach used to study the third and fourth research questions, which deal with the effects of attraction and how attraction differs from search, is based both on *the micro-level analysis* and *the firm-level analysis*. These two levels of analysis complement each other, as the micro-level studies provide detailed information about the effects of specific attraction processes, whereas the firm-level analysis provides a broader perspective about *the aggregated effects* of the inflow of externally developed ideas and inventions on the case companies. This part of the study is based mainly on *the internal studies* of the case companies, since this is where the effects of external ideas and inventions that firms attract occur and therefore can best be studied.

**Table 4.2** The research questions and the research design

<i>Research question</i>	<i>Unit of analysis</i>	<i>Internal/ External</i>
How does attraction work and what are the factors that make firms attractive to external innovators?	Micro level and firm level	Internal and external
In what contexts and under what conditions is attraction important for firms?	Firm level and industry level	Internal
How does attraction influence learning, innovation, and strategy creation in firms?	Micro level and firm level	Internal
How does attraction differ from search?	Micro level and firm level	Internal

### 4.2 Data Collection

As described above, the main data source for the current study is primary data drawn from interviews, which are complemented by secondary data from multiple printed sources. In the following sections, the various steps in the data collection process are described.

#### **4.2.1 Gathering background information and contacting the respondents**

As the starting point of the research process, the current study followed the example of previous studies such as Gavetti & Rivkin (2007) and Siggelkow (2002) by collecting extensive background material about the case companies and their respective industries. This included industry reports, annual reports, information from the case companies' websites, newspaper articles from the business press, and previous academic studies about the case companies.<sup>79</sup> As the next step, financial analysts and industry experts were interviewed in order to collect additional background information.

Once this background study had been carried out, I contacted the case companies directly. The first interview conducted with each company involved meeting with a staff member in corporate communications or a similar function. This approach served the dual purpose of strengthening my general understanding of the companies and providing a road map for determining which people within the organizations would be appropriate to contact for further interviews. Generally, these interviews guided me towards the above-mentioned R&D and business development units. The initial personnel interviewed within these departments constituted the starting points for the identification of other suitable respondents. Each person that I interviewed was asked to suggest other people to whom I should speak. In addition to this informal technique of "snowball sampling," I reviewed organizational charts in order to identify additional potential respondents who had not been mentioned in the previous interviews.

When the respondents were contacted, I referred to the previous personnel with whom I had spoken within the organization, gave a brief description of my project, and asked whether they wanted to participate by granting an interview. In all instances but two (in which the persons felt that they would not be able to provide any useful information), the potential respondents who were contacted agreed to meet with me. As briefly mentioned earlier, a similar method was employed with respect to identifying and approaching external respondents (the external innovators). The external respondents that I contacted also consistently agreed to participate, with the only caveat being that two respondents preferred to remain anonymous.

---

<sup>79</sup> These sources can be found in Appendix B.



### 4.2.2 The interviews

In total, 69 interviews were conducted. The distribution of the interviews among the case companies is listed in Table 4.3. Additional information about the interviews and the respondents, in terms of the lengths of the interviews and the positions held by each of the respondents, can be found in Appendix C. The interviews were, with a few exceptions, conducted face-to-face. In instances in which geographical distance made it difficult to meet in person, the interview was conducted over the phone, as was the case for some of the Autoliv interviews. All interviews were recorded and transcribed except for three, and in those cases, copious notes were taken during the interviews.<sup>80</sup> The interviews lasted between 30 minutes and 2.5 hours, with the typical interview lasting one hour.

The interviews were structured according to two different interview guides, one pertaining to the managers of the case companies and the other to the external respondents. Both of these guides can be found in Appendix C. The interview guides were continuously reviewed and revised after each interview in order to include and follow up on interesting leads that had emerged in prior interviews, according to the logic of an inductive study, in which new and unexpected insights should be allowed to emerge as the study is in process (Strauss & Corbin 1990).

In terms of the interview technique that was employed, the interviews with the managers of the case companies started out with open-ended questions about innovation and business development in their company, as well as questions about the ways in which new product ideas are identified and developed, in order to create a solid understanding of the context to which the external ideas and inventions are attracted. Subsequently, the interviews were gradually narrowed down to focus on topics related directly to the research questions and hence centered on the inflow of external ideas and inventions. This included asking questions about the types of impulses that the company attracts, how these are evaluated, and what roles they play for the company. This interview structure of gradually moving from broad, general questions to questions that specifically pertain to attraction was intended to reduce the risk that the accounts

---

<sup>80</sup> In those instances where some additional questions arose during the transcription of the interviews, a further contact via phone was initiated in order to complement the original interviews.

### *Attraction: A new driver of learning and innovation*

offered by the respondents would be biased in terms of exaggerating the importance of attraction of external impulses because it was the sole topic of the interview (cf. Fontana & Frey 1994).

The interviews with the external firms followed a similar pattern, but were undertaken from a different perspective. The initial questions focused on the company, its products, and its business model, while subsequent questions focused on the reasoning behind the way they had commercialized, or were planning to commercialize, their product ideas. Later, the questions focused specifically on their experiences of presenting ideas to other companies and cooperating with them in the innovation and development processes. At this stage, questions about what they were looking for in a partnering firm were also included, i.e., what the properties are that make a firm attractive.

**Table 4.3** Description of the interviews

<i>Company</i>	<i>Number of interviews</i>	<i>Transcribed interview pages</i>	<i>Time span of study</i>
Autoliv	16	135	13/3-08 - 12/12-09
DeLaval	13	148	12/3-08 - 10/12-09
Ericsson	40	322	21/1-08 - 10/2-09

#### **4.2.3 The secondary data**

With respect to the secondary data, several sources that could provide relevant information were utilized. Based on searches in databases such as Google Scholar and Business Source Premier, previous academic studies about the case companies were identified. These studies proved particularly useful with respect to gaining an understanding for how innovation and strategy development is conducted inside the case companies. With respect to this issue, I was also able in the Ericsson Multimedia case to obtain several internal documents which outline the prescribed innovation process within the company. Further, the database Affärsdata was used to identify newspaper articles about the case companies. These articles included interviews with top executives of the case companies, as well as articles that covered the specific attraction processes that were studied in the micro-level case studies. In the micro-level studies, several key patents

## Chapter 4

were also accessed via the data base esp@cnet. In addition, a number of press releases were identified via the case companies' websites which provided information about the commercial launches of the products that were studied in the micro-level case studies. The distribution of the types of documents that were collected and utilized is outlined in Table 4.4.

**Table 4.4 Description of the the secondary data**

<i>Company</i>	<i>Reports, studies</i>	<i>Internal documents</i>	<i>Patent descriptions</i>	<i>News paper articles</i>	<i>Press releases</i>
Autoliv	5	2	3	6	2
DeLaval	3	3	2	1	4
Ericsson	11	4		9	2

### 4.3 Data analysis

The methods used to analyze qualitative case-based data can vary substantially depending on the research questions and the goals of a particular study, as there is no universally accepted 'boilerplate' approach to analyzing and reporting on qualitative, inductive research (Langley 1999, Pratt 2009). However, despite the lack of strictly codified procedures for qualitative data analysis, previous methodological work, most notably that which was undertaken by Eisenhardt (1989a), has outlined a number of recommended procedures for data analysis based on case study research. Since this study adopts a case study approach, and fits the description set forth by Eisenhardt, the data analysis methods used in this study were conducted according to the procedures recommended by Eisenhardt (1989a) and Eisenhardt & Graebner (2007).

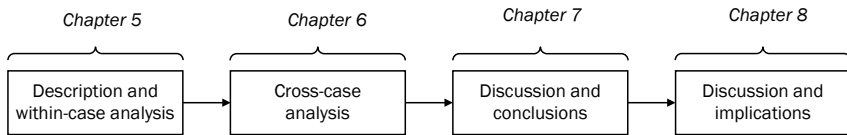
#### 4.3.1 Stepwise data analysis

Figure 4.5 illustrates how data analysis was conducted as a step-wise process, moving sequentially from case description to within-case analyses to cross-case analysis to conclusions, which, in the final discussion, is related to established theory in order to explicate the study's contribution to existing theory. This gradual process is in-

*Attraction: A new driver of learning and innovation*

tended to strengthen the internal validity of the study by carefully showing how the conclusions set forth in the final chapters were developed from the raw data presented in Chapter 5 (Suddaby 2006).

**Figure 4.5 Stepwise data analysis**



In accordance with the advice of Eisenhardt (1989a), each case was first described and analyzed separately, with the aim of becoming familiar with each case as a stand-alone entity. The outcomes of these initial steps of the process are reported in Chapter 5, which contains in-depth descriptions of each case that are intended to foster a rich understanding of how attraction plays out in the case companies and how the companies are affected by the inflow of external ideas and inventions. These descriptions help to fulfill the first part of the aim of the study, which is *to investigate attraction*. These case descriptions were constructed by selecting and coding the information that was related to attraction and the inflow of externally developed ideas and inventions, and organizing it according to a large number of empirically derived categories. These categories were then compared and collapsed into more general classifications.

Significantly, these classifications were descriptive and of a non-theoretical nature, including such categories as *types of external impulses*, *motivations for external actors to approach the case companies*, and *interaction and evaluation processes*. These higher-order categories were also used to organize the presentation of the case descriptions presented in Chapter 5. A somewhat different procedure was applied to the micro-level case studies of specific attraction process that were conducted for each case company. Rather than structuring the description according to categories, the interview data and documents were translated into a time-line for each attraction process, in which key events were arranged in chronological order. Based on this time-line, a narrative description of the course of events was then de-

## Chapter 4

veloped (Pentland 1999). An important feature of the data analysis and the formulation of the case descriptions was that the respondents were given the opportunity to read and review the case descriptions. This allowed them to identify factual errors and clarify other aspects of the case companies, which contributed to improving the accuracy of the case descriptions.

In the next step in the analytical process, each case description was subjected to *a within-case analysis*. This involved a further winnowing down of the data that were presented in the case description in order to condense and synthesize those data that pertained directly to the research questions. This resulted in the identification of a set of core findings that are directly relevant for the research questions and which showed promise of being relevant to the study of attraction. These within-case analyses are also reported in Chapter 5, subsequent to each of the case descriptions.

In Chapter 6, the findings of the case studies were then compared in *a cross-case analysis* that directly addresses the four research questions. Subsequently, in Chapter 7, a more conceptual approach is used to analyze the outcomes of the within-case analyses and the cross-case analysis, which, taken together, represent the synthesis of the information that the case studies provide about the empirical phenomenon and the research questions. Specifically, the concept of attraction is afforded full focus, with the aim of outlining what is distinctly unique about attraction in terms of the functions and benefits it can create for firms, and which no type of internally initiated search can achieve as effectively. In the final chapter, the analysis is concluded by linking the findings and conclusions of the empirical study to established theory in order to explicitly outline how the current study contributes to the existing literature. Altogether, this stepwise process of analyzing the data reflects the study's inductive approach, and is employed in order to explicate the linkages between the empirical data and the subsequent conceptual development that is the end-product of the inquiry as comprehensively as possible.

★ ★ ★

Finally, after having described the research design as well as the data collection procedures and the data analysis process, this chapter will conclude with an appraisal of the quality of the study with respect to its *validity and reliability*.

## **4.4 Quality appraisal and validity**

Eisenhardt (1989a) points out there are no generally accepted guidelines for the evaluation of this type of case study research. However, despite the lack of formalized measures for evaluating qualitative case study research, Gibbert et al. (2008) identify a set of commonly used criteria for assessing the rigor of field research, including *construct validity, external validity, and reliability*. In the following sections, the current study will be discussed and evaluated according to these criteria. In addition, the ways in which the weaknesses of the study with respect to its validity and reliability have been addressed will be discussed, in terms of the measures that have been taken to ameliorate these potential weaknesses.

### **4.4.1 Reliability**

The reliability of a study refers to the extent to which it can be *replicated*, in the sense that another researcher would attain similar results if he or she would conduct the study using the same procedures. This measure indicates whether the results of the study are *robust* or if they contain *random errors or reflect certain biases of the investigator* (de Vaus 2001). In terms of reliability, the weakest aspect of the current study is that it is based largely on interviews, which are known to be problematic with respect to direct replication because the outcome of an interview tends to be influenced by *the situational interaction* between the researcher and the respondent (Merriam 1994).

To a certain extent, this can be remedied by the use of firmly structured interview guides, since this reduces contextual influences that can affect the outcome of the interview. Clearly, the use of interview guides in this study improves its reliability, but since the interviews in the study were only semi-structured, it can be assumed that literal replication of the individual interviews would still be difficult, which might suggest that the study suffers from low reliability. However, although it would be difficult to replicate each individual interview, it is argued here that *each case study as a whole* could be replicated with a high degree of similitude because of the use of *multiple respondents* in each case study. The practice of using of *multiple respondents* has the advantage that accounts of individual respondents can be verified against each other, which means that even if

## Chapter 4

situational factors may bias the results of individual interviews, they are *unlikely to bias the overall findings of the study*. Consequently, it is argued here that it can be expected that a different researcher who interviewed the same respondents and used the same interview guides would reach similar overall results and conclusions as those that are presented in this thesis.

In order to improve the reliability of the study, I also followed the procedures suggested by Gibbert et al. (2008) of creating a case study database in which all the data, including interview recordings, transcriptions, and documents, as well as information about each of the respondents, were collected, so they can easily be retrieved and re-analyzed by later investigators.

### 4.4.2 Construct validity

'Construct validity' refers to how well a study captures what it sets out to measure, i.e., in this study, how well the research design allows the research questions that were detailed in the previous chapter to be answered. A source of uncertainty in this study with respect to the construct validity is the study's heavy reliance on interview-based accounts of key respondents. Arguably, the use of interviews can potentially be both a strength and a weakness with respect to construct validity. It may be considered a strength because close access, based on direct interaction with knowledgeable respondents, is considered to be a primary means of gathering information about complex processes inside of companies, and as such, it may represent the best possible way of gathering information related to the research questions (Eisenhardt & Graebner 2007).

This argument, however, presumes that the respondents are *able and willing to provide accurate information*. Clearly, this cannot be taken for granted, and the information that is obtained from an interview should not be accepted at face value, as there is always the risk that respondents are ill-informed about the subject matter and therefore provide inaccurate information (Miller et al. 1997). In this study, it might, for instance, be the case that managers within the case companies cannot accurately assess how their firms are influenced by the inflow of externally developed ideas and inventions that they attract. In addition, there is the risk that the accounts of the respondents reflect *retrospective sensemaking or the impressions that they seek to convey* rather than accurate information (Golden 1992, 1997).

### *Attraction: A new driver of learning and innovation*

As a result of these potential problems, the heavy reliance on interview-based accounts in the current study may be seen as a weakness with respect to construct validity.

Eisenhardt & Graebner (2007) suggest that these challenges are best addressed by employing certain data collection approaches that limit these biases, most of which were adhered to in the current study. First, the respondents in the case companies were *carefully selected* in order to ensure that they were knowledgeable about the subject. The early phases of the study revealed that managers in R&D and business development functions typically are the most knowledgeable about these processes, and they were hence targeted as the most apt category of respondents. Second, multiple respondents were interviewed in each case company, including managers at different hierarchical levels and managers in different functions. The use of numerous respondents with multiple perspectives on the phenomenon being studied allows the researcher more easily to detect retrospective sensemaking or attempts at impression management, since it is unlikely that the interviews with a varied group of respondents will converge on a similar set of distorted accounts (Miller et al. 1997, Eisenhardt & Graebner 2007).

Third, in addition to the selection of multiple respondents within the case companies, external actors such as external innovators, industry experts, and financial analysts were also interviewed. This allowed me to verify the accounts of the managers of the case companies and constituted a form of triangulation, which is a recommended procedure for improving a study's construct validity (Gibbert et al. 2008). Finally, in order to avoid misinterpretations on the part of the investigator or misunderstandings in the interaction between the investigator and the respondents that could compromise the construct validity of the study, the drafts of the case descriptions were reviewed by the respondents so that factual errors could be corrected.

In sum, this suggests that several of the problems associated with the construct validity of interview-based studies have been ameliorated by the processes and criteria used to select the respondents and by allowing respondents to review drafts of the case descriptions. However, the risk that the study's construct validity is compromised by certain *shared misperceptions among the respondents*, such as, for instance, a systematic tendency among the respondents to under- or



overestimate the significance of attraction and the inflow of external impulses, cannot be entirely ruled out.

#### 4.4.3 External validity

External validity, or generalizability, is always a challenging issue in case study research, since the sample sizes are typically not large enough to allow for statistical generalization (Yin 1989). A commonly evoked response to the problem of external validity in case study research is to argue that case studies should not be generalized to populations, but rather, to theory, through a process of *analytical generalization* (Yin 1989, Eisenhardt 1989a). This argument also applies to this study, as it aims to develop new concepts and build theory; it could hence be argued that the findings of the study should be generalized *to theory* rather than to populations of firms, and that the problem of external validity is therefore of limited significance. However, even if one acknowledges that case studies are important vehicles for conceptual development and theory building, the type of study that is being conducted here still calls into question in which *domain* the newly developed concepts and theory can be applied. This, in turn, brings us back to the original question of generalizability, in the sense that the extent to which the concepts that are developed in this thesis possess validity outside of the specific contexts in which they were generated needs to be outlined.

A number of measures were employed to ensure that the findings and conclusions attained in this study would have validity beyond the immediate context in which they were developed. First, companies from different industries were selected; in total, companies from seven different industries were studied (the main study covered three industries and the pilot study four industries). This variation is contended to reduce the risk that the findings only represent the idiosyncratic properties of a certain industry. Second, the selection of case companies for the main study was conducted without any prior expectation that attraction would be particularly important in these settings. It is argued that by avoiding the study of only companies in which attraction plays a prominent role in the firm's strategy, the risk that the findings and the subsequent theory building are valid only for a group of extreme cases of outlier firms that seek systematically to leverage attraction has been reduced.

*Attraction: A new driver of learning and innovation*

In sum, this suggests that there is reason to believe that the findings and conclusions of the study are relevant not only to the specific contexts in which they were generated, but also to the larger population of established firms across different industries. However, despite these claims, as always, caution is warranted when research is based on a small number of cases. In effect, even though there is no reason to believe that the emergent theory outlined in the current study cannot be generalized more broadly and applied to the population of large, established firms in general, there is also no conclusive evidence to suggest exactly what the relevant domain of the emergent theory is. Specifically, certain caution is warranted with respect to the possibility that attraction plays out differently in different *institutional and cultural contexts*. As described previously, this study covers the North American context as well as the Swedish context, and it would clearly be valuable for future study to replicate the findings in other settings in order to investigate whether the findings that are presented in this study are robust across different institutional and cultural contexts.

★ ★ ★

This discussion of various validity measures related to the study's research design and the methods that were employed to collect and analyze the data concludes the current chapter. In the following chapter, the empirical findings of the study will be presented in the form of *case descriptions* and *within-case analyses*.

## Chapter 5

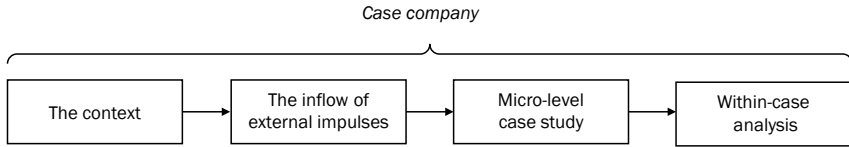
### Case descriptions and within-case analyses

In this chapter, I present the findings of the empirical study. The three case companies, Autoliv, DeLaval, and Ericsson Multimedia, which were briefly described in the previous chapter, are each analyzed separately, leaving the comparative cross-case analysis to the next chapter. In order to facilitate comprehension of the results, the case studies are presented in a standardized format. As shown in Figure 5.1, each case study starts with a description of *the context*, in terms of the company, its products, and the way R&D and innovation is organized in the company. These sections are intended to provide an understanding of how the attraction processes that are specifically being studied fit into the broader industry and company contexts.

Thereafter, *the attraction of externally developed ideas and inventions* is addressed directly. This section includes descriptions of how the companies are affected by this inflow, how they evaluate such impulses, and whether and how the companies work to stimulate the inflow of external impulses. Notably, the structure of this section, in terms of the issues that are high-lighted, is guided by the study's research questions and the preliminary findings obtained from the pilot study. Subsequently, *the micro-level case studies* are presented, which are intended to provide in-depth descriptions of specific attraction processes. Finally, after each case description, the findings are brought together and analyzed in *a within-case analysis*.

## *Attraction: A new driver of learning and innovation*

**Figure 5.1** The structure of the case studies



### **5.1 DeLaval and the milking system industry**

In 2006, DeLaval changed the organization of its R&D activities and created a new unit called Research and Innovation (R&I), which would be responsible for the identification of new potential product areas and provide an incubator environment for ideas for radical innovations. One objective of this attempt to stimulate radical innovation within the organization was to improve DeLaval's ability to adopt ideas and inventions presented to the company by external actors. Hans Holmgren, Director of R&I, explains that such external impulses are an important source of novelty and creativity for DeLaval:

“Within R&I, we are convinced that we are dependent on getting an external inflow of ideas that can then be confronted with internal ideas, and hopefully, they will then reinforce each other. This is extremely important because it frees up creative resources that have not yet become subject to the limitations and restrictions of the company's innovation system.”

Below, I describe and analyze the role that such external impulses play for DeLaval and outline the ways in which the attraction mechanism plays out for the company. However, before specifically addressing these questions, the company and the industry will briefly be described in order to provide information about the context within which these attraction processes take place.

### 5.1.1 The Context

#### The company and its products

DeLaval<sup>81</sup> is a full-service supplier of milking systems for use by dairy farmers. The company develops, manufactures, and markets a broad range of products related to dairy farming and milk production. DeLaval sells its products to dairy farms of different sizes through direct sales or dealerships, and has a market presence in more than 100 countries and on all continents. The company employs 4 700 people and in 2008 had an annual turnover of 1 025 million Euros,<sup>82</sup> making it the world leader in the market for dairy farming equipment, with a global market share of approximately 25%.<sup>83</sup> Traditionally, DeLaval's core business focus has been equipment for milk extraction from cows, i.e., milking machines. However, for some time, this has been a mature market in the sense that it is based on mature technologies and because the number of dairy farmers is decreasing due to consolidation that is taking place at the farm level.<sup>84</sup> As such, the technology for milk extraction has been diffused throughout the industry, which has created a constant pressure from competitors who offer low-cost alternatives to take market share from the differentiated and higher-priced solutions that DeLaval offers. It also means that the opportunity for growth through increased sales volume is limited, as the number of farms -- and thereby the number of potential customers -- has continued to decline.

For many years, DeLaval's response to the limited growth opportunities in the market and the maturity of the core technology for milk extraction has been a combination of continuous investments in R&D aimed at maintaining technological leadership in the industry through successive revitalization of the company's core technologies and the ongoing introduction of new products in related areas, with

---

<sup>81</sup> DeLaval is part of the larger Tetra Laval group, which in addition to DeLaval, also contains the companies TetraPak and Sidel. DeLaval, formerly known as Alfa Laval Agri, assumed its current name in 2000.

<sup>82</sup> DeLaval (2009).

<sup>83</sup> The company's major international competitors are the WestfaliaSurge Group, Lely, and Boumatic. In addition, a large share of the market is held by smaller local firms that operate without widely recognized brand names. Known as "grey competition," these firms tend to offer lower-cost solutions than the international players.

<sup>84</sup> Two of the core elements of milk extraction technology, vacuum and pulsation, were introduced in 1917 and 1966, respectively (Åman 2003).

*Attraction: A new driver of learning and innovation*

the goal of increasing the number of offerings available to existing customers. Because the company has sought continuously to add new products (and some services) in order to provide a comprehensive selection to the dairy farmers that comprise its customer base, DeLaval today offers a wide variety of products, including different types of milking systems, milk cooling systems, feeding systems, manure management solutions, energy recovery, cow comfort products (including pharmaceuticals, hygiene products, and detergents), service products, and spare parts. An essential aspect of the structure of DeLaval's product portfolio is the fact that approximately half of its sales come from so-called *installed equipment*, such as milking and cooling systems, while the other half derives from the so-called *after-market*, which includes consumable goods such as hygiene products, cow comfort products, brushes, and cow pharmaceuticals.

A significant trend in the industry in recent years, which is also reflected in DeLaval's product portfolio and strategies, is the increasing *information and knowledge intensity* that characterizes dairy operations at the farm level. This increasing information and knowledge intensity is driven by an increased focus on optimizing the milk production of each cow. Traditionally, dairy farming was based largely on received practices and the tacit knowledge of the dairy farmer. Today, however, milk production is becoming more systematic and increasingly oriented towards productivity and higher returns on investment. The most effective manner of achieving this is to improve decision-making processes by basing actions on more accurate information and faster, more reliable information processing methods. Providing information and knowledge to the farmer has therefore emerged as an increasingly important point of differentiation between DeLaval and its competitors, which in turn has resulted in the integration of more software and diagnostic tools in DeLaval's milking systems.<sup>85</sup> This is perceived to be a key growth area for DeLaval, a fact that is emphasized by Tor Bratland, Director of Product Portfolio, Tied-Up Milking Systems and Supply:

"There is a lot more coming on the analytical side – the cow's health, her productivity and return, and how you optimize this. That is a growth area."

---

<sup>85</sup> This increased "intelligence" in the systems includes analytical tools that support on-farm decision-making about the detection of diseases, optimal nutrition, and optimal timing for breeding and reproduction.

### The organization of R&D in DeLaval

Since 2006, the R&D organization of DeLaval has been divided into two departments, Research and Innovation (R&I), which is helmed by senior technical director Uzi Birk, and Development and Engineering (D&E), headed by Maria Poppen Wiklander.<sup>86</sup> Generally, the R&I unit focuses on the early stages of new product development and has a mandate to pursue innovation projects with longer time horizons and more uncertain outcomes, whereas D&E focuses on the latter stages of product development and new opportunities that are related to existing products. In terms of the division of labor, this means that R&I focuses primarily on the identification of ideas for new types of products, which is followed by evaluation, concept validation, and the development of prototypes; D&E assumes responsibility for a project once the concept has been successfully evaluated. D&E also works with incremental innovation of the firm's existing product areas and responds to requests for modifications of products or the addition of products similar to those that competitors market, but which are not currently being sold by DeLaval.<sup>87</sup>

### New product ideas: "Closing the gap" and internal R&D

Ideas for new products and other types of strategic initiatives within DeLaval come from many different sources, including top management, internal R&D engineers, existing suppliers, customers, and personnel within the firm's marketing and sales organization. A key

---

<sup>86</sup> Historically, innovation at DeLaval was a relatively distributed process. A number of core products were developed at the central R&D unit in Tumba, Sweden, but a significant proportion of the complementary products were developed by the firm's local subsidiaries. However, over time, R&D activities became much more centralized and concentrated within the central R&D unit. This development was driven largely by the ambition to leverage economies of scale in R&D and to avoid inefficiencies associated with duplicating similar components or products in different markets. In addition, DeLaval's aim to offer complete, integrated systems and solutions required a centralization of product development, because new products had to be integrated with larger systems of interrelated components (Åman 2003).

<sup>87</sup> The rationale for breaking out a separate department for research and innovation was, as mentioned previously, improving the organization's ability to identify and capture new product ideas that represent radical innovations and thus may require a longer time to market, as it was perceived that such ideas were often lost, and that the more immediate demands from the managers of the existing product portfolios, as well as the incremental development of existing products, tended to crowd out the more far-reaching ideas.

### *Attraction: A new driver of learning and innovation*

mechanism through which DeLaval learns of new product ideas is known internally as *closing the gap*, which refers to a process through which members of DeLaval's sales staff report that a competing firm is selling a product that DeLaval does not offer. This report is conveyed to the internal R&D units or an external supplier, which in turn begins working on a solution to fill this gap. This mechanism is particularly important with respect to the category of aftermarket products. The company's internal R&D engineers represent a second main mechanism for the identification of new product ideas, especially with respect to innovations within DeLaval's core area of milking systems.

#### **5.1.2 DeLaval and the attraction of external ideas and inventions**

##### **Who approaches the company and what is their motivation?**

In addition to the above-mentioned sources of new ideas, DeLaval also attracts a continuous inflow of externally developed ideas, inventions, technologies, and even finished products from different types of external innovators who seek to cooperate in different ways with DeLaval. Hans Holmgren, Director of R&I, explains that:

“It can be individual inventors; it can be academic institutions. Another, more typical case is that a company has developed an interesting product which would fit into our product portfolio, which leads to contacts and different degrees of cooperation depending on how far they have come. We have all levels, from finished products to merely a trail of thought.”

The majority of the impulses come from *within* DeLaval's industry. Senior milk extraction specialist Torbjörn Petterson argues that when DeLaval is approached by firms from other industry contexts, this approach activity is typically limited to larger firms that have identified an opportunity to apply technologies and capabilities developed in another setting to dairy farming. Tor Bratland, Director of Product Portfolio Tied-Up Milking Systems and Supply, suggests that the more systematic efforts by which external actors target DeLaval tend to originate from within the industry, whereas contacts from other fields are typically the result of chance and coincidence. He notes that:

“DeLaval's attraction is strong within our own industry, but besides that, I believe it's mainly coincidence that determines if we get contacts from oth-



## Chapter 5

er areas. [...] This is because we are dominant in our industry but we may not be large enough for other industries to automatically see a common denominator with DeLaval.”

One key factor that compels external actors to approach DeLaval is the company’s *worldwide distribution network*. Selling directly to dairy farmers without having an established distribution relationship is difficult in all product categories related to dairy farming. Göran Karlsson, DeLaval’s Director of Product Portfolio, Farm Supply and Barn Equipment, stresses that:

“It’s distribution. We have this global distribution network. You have very little chance of succeeding in the market unless you . . . [partner with] companies like DeLaval or WestfaliaSurge and get help with the distribution.”

As described previously, the firm’s market consists partly of large installations such as milking machines, cooling tanks, and feeding systems. In most developed countries, this segment of the market is heavily dominated by the large firms such as DeLaval, Lely, and WestfaliaSurge. An important reason why this market is so consolidated is that these products are sold as complete system solutions, which only a relatively small number of firms possess the requisite R&D resources and technical capabilities to be able to develop and deliver. The lack of a market for stand-alone products means that smaller firms that possess expertise within one or several parts of milking system are forced to establish partnerships with their larger counterparts in order to have their products integrated into the complete system setups sold by the market incumbents.

The difficulties of reaching out as a smaller independent firm have been further exacerbated by the increasing software-intensity of modern milking equipment, rendering the integration of the components into a single system even more important. Notably, this development has had two effects related to the attraction of externally developed ideas and inventions to DeLaval. First, it has made it even more crucial for external firms to go through DeLaval to access the market, because in order to sell their products, these smaller firms need to have their products integrated or at least made compatible with DeLaval’s systems, which in turn has increased the inflow of ideas and inventions into DeLaval. Second, the increasing importance of software-oriented solutions in the industry has made it more complicated

### *Attraction: A new driver of learning and innovation*

for DeLaval to adopt externally developed ideas and inventions, because these often require extensive modification and retrofitting in order to be integrated with the company's software-controlled systems, which limits the extent to which DeLaval can benefit from external inventions.

It is seemingly easier for smaller players to enter the aftermarket products segment, since products such as detergents, milk filters, brushes, and other disposable and limited-use tools and equipment are often stand-alone products, rather than interrelated components of a system. However, one problem facing smaller independent firms or newcomers in this part of the market is that it is difficult to find a distribution channel through which farmers can be reached aside from the distribution networks of the large incumbents. This is due to the fact that most farmers buy their aftermarket products directly from the DeLaval or WestfaliaSurge service technicians and salespersons who make regular farm visits. As such, once a firm has delivered a complete milking system to a customer, it also has a significant advantage in the aftermarket segment. As a result, the most realistic distribution strategy that a smaller firm seeking to infiltrate the aftermarket segment can pursue is to try to get their product included in the portfolio offered by DeLaval or another large firm.

In sum, this section indicates that the attraction exerted by DeLaval is strong within the company's own industry as a result of its long-term success in the market place which is manifested in its high market share, its role as a provider of complete milking systems to dairy farmers, and its extensive distribution network. This leads to a situation in which a large share of all new ideas and inventions that emerge within the industry are channeled to DeLaval. However, the findings also suggest that DeLaval's attraction is not particularly strong outside of its own industry and that it is relatively uncommon that actors from distant contexts are attracted to DeLaval and identify combinatorial opportunities with the company.

#### **How is DeLaval affected by the inflow of external ideas and inventions?**

The study shows that the inflow of externally generated ideas and inventions can play significantly different roles and have different effects depending on the product area and the type of innovation or strategy development that is concerned. In order to understand how this inflow influences DeLaval, it is therefore necessary to take these differences into account and analyze the company's different product

## Chapter 5

areas and innovation dynamics separately. Based on these findings, the case description is structured around three categories: (i) continuous innovation in core products and technologies (i.e., fixed installations such as milking systems and cooling tanks), (ii) the development of new products for the firm's large portfolio of complementary products (i.e. aftermarket products, such as hygiene products, milk filters, pharmaceutical products, and brushes), and (iii) radical innovation aimed at the development of new product areas and technologies.

### Continuous innovation in core product areas

As described previously, DeLaval has a small number of core technologies, including vacuum-based milking and cooling, which constitute the base for DeLaval's core product offerings of milking systems and cooling systems. Within these areas, DeLaval has, over time, continuously invested large resources in R&D, and the company has thereby developed and maintained a position of technological leadership in the field. Because these are DeLaval's core areas and because they are the types of products and technologies that external actors readily associate with DeLaval, the company receives a large number of external impulses in these areas. Ole Lind, Director of R&I, explains that:

"It is known that we are the world's largest manufacturer of milking equipment, and if someone comes up with a new way of milking or a new pulsator, then it's pretty natural that they come to us."

Typical ideas that DeLaval attracts within this area include new types of pulsators, new types of udder cups, and new ways of creating a vacuum, or novel materials, such as new types of rubber. However, despite the rich inflow of external impulses within these core areas, it is *rare* that an external impulse is actually adopted. Torbjörn Pettersson, senior milk extraction specialist, explains that:

"When it comes to milking, I don't think we have anything that has come from the outside."

Typically, DeLaval managers argue that within these core areas, it is *the internal knowledge and capabilities* that are key to maintaining DeLaval's technological leadership. They further argue that the posi-

*Attraction: A new driver of learning and innovation*

tion of leadership that DeLaval has developed and maintained over many years makes it unlikely that an external actor will be able to outperform the level of innovation that the firm's internal R&D processes can produce. In line with this, Tor Bratland, Director of Product Portfolio Tied-Up Milking Systems and Supply, suggests that:

“The milking as such, we can manage pretty well on our own; it's the core knowledge of the company.”

Despite the fact that external impulses very rarely are adopted within DeLaval's core areas, meetings still continuously take place between DeLaval R&D managers and external actors who seek to present DeLaval information about their ideas or inventions. These meetings usually lead to an evaluation, but they very rarely lead to any concrete results in the sense that the new idea or technology is implemented in a DeLaval product. However, the fact that DeLaval continues to agree to these meetings and initiates product evaluations based on the discussions suggests that there are certain indirect effects that are of some value to the firm.

Torbjörn Petterson, senior milk extraction specialist, explains that in certain instances the company may learn things from a meeting with an external impulse provider even if the external idea or invention ultimately is not adopted. In addition, Petterson brings up another important aspect of attraction, namely, that many of the impulses that DeLaval attracts are not ideas that are completely new to the company. In fact, many of the ideas encountered in meetings with external innovators have already been considered within the company, but they have never been fully realized because they were not considered sufficiently urgent to merit the allocation of the necessary R&D resources. Petterson points out that an external impulse can sometimes inject the requisite sense of urgency that is necessary to ensure that a latent idea or project is taken up again. He explains that:

“There is hardly anything that is new, but most thoughts are already there in one way or another, and sometimes it has been pondered and considered within the company. Then there may be a ‘twist’ to it that comes in from the outside, which makes you start working on it again, or that you anticipate that a competitor would take care of it otherwise.”

## Chapter 5

However, the case findings indicate that these indirect effects are relatively peripheral, and in sum, the study suggests that the inflow of externally developed ideas and inventions plays a limited role in the continuous development of DeLaval's core technologies and core products.

### The addition of complementary products

As described previously, DeLaval has a very broad aftermarket product portfolio in addition to its core products, which is in line with the firm's strategy of offering *complete solutions* and its aim to cater to all the needs of the dairy farmer. The aftermarket product category is of a different nature than the milking, cooling, and feeding systems, in the sense that it consists largely of stand-alone products that are much more disparate in nature, including diverse products such as brushes, detergents, pharmaceuticals, and work clothes. As a result of the diversity of this product category, the processes of innovation and product development follow a different logic and require different capabilities as compared to the innovation of the core products described in the previous section. Whereas the development of the core products is a matter of making incremental refinements to a small number of products through internal R&D, this side of the business is about continuously staying up-to-date with what the customers need and *constantly launching new products* in order to drive growth and to avoid having customers turn to other suppliers. Göran Karlsson, Director of Product Portfolio Barn Equipment and Farm Supply, explains how these two product categories are related:

"We are very skilled at making milking machines and cooling tanks. That is where we have our strength. When we sell a complete package, the customer wants to buy as much as possible from one partner, and then we can consolidate and offer a whole system. So once you have a customer, it's about retention, and then it comes down to having a broad and attractive assortment of products. You fill out all these gaps."

A significant consequence of the breadth and diversity of the product assortment that is necessary in order to attain this goal is that it is very difficult for DeLaval to identify all the existing and latent needs that its customer base may possess. A further consequence is that it is difficult to harbor within the company all of the technological competencies that are required to provide this many products, since they are based on an array of very different technologies. Consequently,

*Attraction: A new driver of learning and innovation*

within this product area, DeLaval relies heavily on external ideas and external actors who are specialists within one or more product areas. Göran Karlsson, Director of Product Portfolio Barn Equipment and Farm Supply, explains that his product area benefits significantly from external sources of product development and innovation:

“I usually say that I have my development resources outside of the company. I have thousands of engineers whose brains I get to access, and in comparison with that, our R&D department is not so big.”

Karlsson goes on to explain that the development of such externally envisioned products is sometimes driven by the external party and sometimes by DeLaval:

“Often, you find something on the web or a colleague has seen something. Then there is the other way around -- there may be a company that has something and then contacts us and tries to sell their idea or item to us.”

Because of the breadth of DeLaval’s existing product portfolio, the companies that approach DeLaval come from a wide variety of industry backgrounds. Karlsson explains that:

“They can come from anywhere. Last week I had a meeting with a company that produces work clothes. Another meeting was with a company that works with fresh water tanks on ships that had an idea about how their product could be applied in agriculture. They contacted us. Sometimes something comes out of it, and sometimes not.”

An example of a product that entered the firm’s product portfolio as the result of an external company presenting their idea to DeLaval is a new type of automatic cow brush, which today generates annual revenues of approximately 10 million Euros. In general, with respect to this type of product, it is the external supplier who carries out the development process. DeLaval rarely in-sources only the idea for a new product, preferring instead to have external suppliers take care of both development and production.

In sum, it can be concluded from the case findings that because the diversity of customer needs makes the identification of product ideas challenging and because a broad range of technologies are needed in order to respond to these customer needs, the attraction of externally developed ideas and inventions plays a vital role for prod-

## Chapter 5

uct development and innovation in the aftermarket area, as it complements DeLaval's own efforts to identify ideas for new products.

### The creation of new product areas through radical innovation

In addition to the continuous innovation of core technologies and the ongoing addition of smaller products to the portfolio, DeLaval, like all companies, needs to enact processes of radical innovation in terms of the creation of new product areas and radical technology shifts within the existing core products. Indeed, the reason for the formation of the R&I unit was, as mentioned previously, largely to provide a foundation for this type of profound technology leap, which often requires extensive research and development resources over long periods of time. With respect to this type of innovation, it is generally emphasized by DeLaval personnel that the inflow of externally developed ideas and inventions is *an important source of creativity*, as these external ideas are not bound by existing technologies and existing ways of thinking within the company. Hans Holmgren, Director of R&I, stresses that:

"I believe that in today's environment of rapid technology development -- and given the "freezing" that often takes place in internal R&D departments -- in order to remain viable over longer periods of time, it is necessary to receive powerful external impulses, almost odd ideas. I believe that some level of creative renewal must take place outside of the company. In other words, when it comes to development, we must align ourselves with external forces, with innovative companies that have come up with ideas in areas where they have core competencies, at least up to certain levels, so that you reach a prototype stage."

Likewise, R&D manager Otto Hellekant suggests that many other sources of innovation are bound by existing ways of doing things and that neither the customers nor the people responsible for the product portfolios can consistently come up with truly novel product ideas:

"In order for customers to contribute to the development process, they need to have something to look at [...], but they can't contribute ideas for the next generation of products or anything like that. We get demands from the product portfolio managers, but that is not so forward-looking; it is mainly about things that we are lacking in our product portfolio."

Hence, it is argued that a partial solution to the challenge of fostering more radical innovation is to capture ideas from external parties, with

*Attraction: A new driver of learning and innovation*

a particular focus on smaller companies. This strategy is also championed by Uzi Birk, Senior Technical Director of R&I, who stresses that:

The radical innovations, the real bestsellers, often cannot come about through normal R&D processes in large companies. You can only hope for incremental innovation. The really big ideas come from smaller companies, and to succeed, they often have to penetrate the larger companies, since they can't make it on their own. Large companies are built on structured processes, and in order to develop bestsellers you need more turbulence. The tendency is to go outside to smaller companies and channel it in."

The case findings suggest that DeLaval encounters these externally generated ideas both through its own search activities and through the unsolicited inflow of external ideas. However, Hans Holmgren, Director of R&I, explains that DeLaval largely relies on external actors to approach the company, rather than vice versa:

"At the moment, with the resources we have available, it is mainly them who come to us. Most of the activity comes from the ones who find us, for instance, over the Internet."

The most notable examples of products that have been based on external impulses are products related to *on-farm milk analysis*. The processes that led up to the initiation of this product line within DeLaval are discussed in detail in the next section, and therefore, they will only briefly be described here. In short, the creation of the DeLaval Cell Counter, an instrument for on-farm milk analysis, was initiated by a small Danish firm called ChemoMetec, which presented the idea to DeLaval. In addition, a more advanced system for milk analysis was initiated by Danish company Foss, which approached DeLaval with a proposition for a joint venture. In addition to these successful adoptions, DeLaval's activities within the area of milk analysis have stimulated a further inflow of external impulses from other industries. Ole Lind, Director of R&I, notes that:

"Within the area of milk analysis, we have gotten some publicity, so there are quite a few proposals from people conducting research within fields such as cancer on the human side as a result of the information on the web that we are doing cell counting and can measure diseases such as mastitis."



## Chapter 5

Another externally developed idea that is currently under evaluation is the concept of developing cooling systems for dairy farmers based on a new type of technology. Several years ago, a French company developed a new type of solution for cooling for a different purpose.<sup>88</sup> Soon afterwards, the firm realized that a major part of DeLaval's business was cooling systems, and as such, they contacted DeLaval and inquired about whether DeLaval would be interested in learning more about such a solution. Because the technology promised significant energy savings as compared to their existing cooling technology, DeLaval responded positively to the impulse. As a result, a non-disclosure agreement was signed and initial evaluation and prototyping is currently taking place. If the development proves successful, this would represent the most substantial technology leap that DeLaval has made in cooling systems in many years.<sup>89</sup>

Another external impulse that may become important for DeLaval in the future was not so much an invention or a technology, but rather, *a strategic initiative* that originated outside of DeLaval. At the current juncture, DeLaval is conducting a substantial development project aimed at creating automated milking systems that are much larger than the company's current models. The primary impetus behind this project came from Dairy Australia, which is a public company formed by the dairy industry in Australia.<sup>90</sup> Dairy Australia is dedicated to improving productivity and technological development within the dairy industry in Australia, and in 2003 the organization started documenting the milking methods most commonly employed in the country. Typically, Australian dairy farms are very large, with many cows on each farm. Dairy Australia noted that there should be some potential for further automating the milking process, since it

---

<sup>88</sup> DeLaval has elected not to reveal any information about the nature of the technology due to the early stage of the development that the project is in.

<sup>89</sup> A further example of an external invention that initially was thought to hold the promise of radical innovation consisted of a technique for milking cows without using a vacuum, which has been a fundamental aspect of milk extraction for more than 50 years. The technology was initially developed for a completely different purpose, as the inventor, Jonas Johansson, had conducted research with the aim of developing an artificial heart to be used for human heart transplants. After realizing that the resulting technology may be beneficial in the milk extraction process, Johansson presented the concept to DeLaval. However, although the technology showed promise, the project ultimately was abandoned due to difficulties in reaching an agreement about the value of the invention.

<sup>90</sup> DeLaval (2005).

### *Attraction: A new driver of learning and innovation*

remained relatively labor intensive at the time. In order to investigate the possibilities for increased automation, they contacted DeLaval to explore the possibility of a collaborative partnership to research the issue. Senior Technical Director Uzi Birk explains that:

“The idea behind the big automation project that DeLaval is now a part of came from Australia. The project is part of a larger project that seeks to modernize and automate the agricultural sector in Australia. They believe in automation and wanted companies in on the project who can develop new products.”

With this project, DeLaval aims to develop global products for the emerging type of extremely large dairy farms. As explained, the product is still in the prototyping stage, but it is clear that if the product can be taken to market, it will provide DeLaval a source of competitive advantage in this particular segment of the market.

Based on this presentation of the case findings, it can be concluded that the attraction of externally developed ideas and inventions plays an essential role in inspiring radical innovation at DeLaval, both in terms of ideas for new product areas and new technologies in existing product areas. The findings further suggest that external inflow grants DeLaval access to a wide-ranging pool of ideas developed by a diverse group of actors who base their ideas and inventions on different technologies, mindsets, and practices than those that are dominant within DeLaval.

#### **The evaluation and interaction process**

After an external actor has approached DeLaval and an initial contact has been established, subsequent steps in the process include the idea being redirected to an appropriate gatekeeper within the organization. Next, the idea is evaluated, and if it is determined that the concept could be valuable to DeLaval, the terms of a potential agreement are negotiated. The study shows that each of these steps presents a number of difficulties and challenges that tend to limit the number of external ideas and inventions that ultimately are adopted, and that these challenges must be overcome in order for the process to result in the commercialization of a new product or the adoption of a new technology.

The external ideas and inventions that are presented to DeLaval originate in many different locations, and consequently, they tend to

## Chapter 5

be forwarded to many different DeLaval units across the world, entering the organization at a number of different organizational levels. Uzi Birk, Senior Technical Director of R&I, notes that:

“Because of the multitude of personal networks involved . . . [the external ideas] can hit the organization anywhere. Some external innovators go directly to the CEO or someone they know on the board of directors, and then there are those who go to a person that they know at DeLaval. Often, they hit up a service technician or a salesperson with a proposal.”

The fact that the impulses can enter the organization at many different points of contact provides a logistical challenge for DeLaval in terms of capturing new ideas and ensuring that they are directed to the right person. The degree of difficulty involved in this process, however, depends on the nature of the impulse that DeLaval receives. The closer the concept is to being a finished product and the more related it is to DeLaval’s current product portfolio, the easier it often is to guide it to the correct person within the organization. In such cases, the external impulse can usually be directed fairly easily to the head of the relevant product portfolio, such as Göran Karlsson (who figured prominently in the previous section), who can in turn evaluate the concept based on the needs of the product portfolio.

However, many of the impulses that have the potential to create new product areas and that represent radical innovations are in an early stage of development when they reach DeLaval and will still require extensive development and concept validation, including the creation of prototypes and the evaluation of different technical solutions, as well as the formal assessment of the commercial potential of the idea. Ideas and inventions that are far from being finished products, are not closely related to DeLaval’s existing product areas, or that employ technologies that diverge significantly from DeLaval’s core strengths can be much more difficult for the firm to process efficiently. Uzi Birk, Senior Technical Director of R&I, explains that once the ideas are introduced to the organization, there is a major risk that they will get stuck in the organization because nobody takes responsibility for developing the ideas. Historically, this has been a problem that has limited the benefits that DeLaval has been able to derive from the attraction mechanism and the inflow of external impulses. Uzi Birk argues that the creation of a separate R&I unit has remedied this problem to some extent, but he also adds that:

*Attraction: A new driver of learning and innovation*

“R&I is not yet sufficiently known throughout the organization. We would probably get a bigger pool of ideas to innovate around if we were better known.”

However, even if an idea reaches the right person within DeLaval, the study further shows that the evaluation of the idea is sometimes impeded by a lack of trust between involved parties. Approaching firms are often nervous that their ideas will be stolen, and as such, they are often reluctant to explain their idea or innovation in detail, which in turn makes the evaluation process more difficult. In order for a fruitful discussion to occur, it is therefore crucial to create a sufficient degree of trust between the parties at the very earliest stages of the collaboration process. Assuming that a sufficient degree of trust has been established so that a proper evaluation can be carried out, the final hurdle in the process is the negotiation of the terms of the agreement and the assessment of the value of the idea or invention.

When it comes to nearly finished products, this step is relatively uncomplicated, since potential value can be established more easily and DeLaval typically can use the external party as the supplier. However, in instances in which the idea is far from ready to be introduced as a commercial product, the process of negotiating the terms of the agreement is typically much more complicated, not least because the value of the ideas or invention remains largely unclear. Despite these problems, Hans Holmgren, Director of R&I, emphasizes the importance of engaging in these discussions and collaborative partnerships, because the firm otherwise might miss valuable opportunities and fail to respond to changes in the industry:

“There are problems, but it is our responsibility to solve these. You must never have the attitude that it is too sensitive and fraught with difficulties to accept outside ideas, and that it always leads to problems. Instead, you need to find the tools you need to deal with this reality, because otherwise, you’re missing the inflow and that is very dangerous.”

In sum, this suggests that the evaluation and adoption of external ideas and inventions becomes increasingly complicated the more conceptual and undefined the idea is when it is brought to DeLaval’s attention. This in turn imposes certain restrictions on the extent to which the company can benefit from the attraction mechanism and requires the company to find ways of handling the challenges associated with the adoption of undeveloped ideas and inventions.

## Chapter 5

### DeLaval's role in attracting external ideas and inventions

As shown in the pilot studies, firms can be either active in terms of seeking to attract external impulses, or assume a passive position and rely largely on external actors to approach them spontaneously. In the case of DeLaval, the preferred mode of attraction is largely *passive and spontaneous*. The company does not make any deliberate attempts to stimulate external innovation or to compete actively with rival firms for external impulses. Göran Karlsson, Director of Product Portfolio Farm Supply and Barn Equipment, explains that:

“We don't communicate outwards what we are searching for. The ones who know us, know what we are looking for.”

It is, in other words, assumed that the external actors who have something that could be of value for DeLaval will likely choose to approach DeLaval anyway, so there is little need for explicating DeLaval's focus areas. Hans Holmgren, Director of R&I, reinforces this assessment, but adds that there might be benefits associated with taking a more proactive approach to attraction:

“We don't go out with a message on our website where we invite people to come to us with ideas. We are a relatively anonymous company, especially when you consider that we are the global leader in our industry. Sure, we are well-known within the industry, but we are not so well-known outside our industry. We should, in my opinion, make ourselves more publicly known in order to attract new ideas and the right people. It is also not known that we work with advanced technologies, such as advanced vision systems and robotics. That should be made more visible as it could create an inflow of the right people and ideas.”

The few activities undertaken by DeLaval that can be interpreted as attraction-enhancing are generally carried out at the individual level. One example of such an activity occurs when DeLaval R&D managers attend conferences and present the findings of scientific studies that they have conducted. This tends to position the presenter and, indirectly, DeLaval, as a central actor within that particular field, which in turn increases the likelihood of attracting impulses within that area. Hans Holmgren, Director of R&I, emphasizes that some of the attraction that DeLaval exerts operates at the individual level:

“What we have going for us is that we are the people that we are. In our interfaces with the external environment, we get contacts and become known

### *Attraction: A new driver of learning and innovation*

for certain things. Take Uzi Birk, who is a well-known person in Israel, where there are many companies and where we find many interesting partnerships, and that is probably because he is well-known there. We would probably benefit from having more ‘celebrities’ of that kind.”

★ ★ ★

In sum, we can conclude that from DeLaval’s perspective, the attraction of external impulses is largely a spontaneous process driven by the actions of external actors, rather than by any stimulating activities undertaken from DeLaval’s end. While DeLaval managers are relatively confident that a substantial number of interesting, externally generated ideas will reach the company, there seems to be an awareness that making the company more visible in broader circles outside the immediate industry setting might lead to an increased inflow of new and interesting ideas from other contexts.

#### **5.1.3 Micro-level case study: The creation of on-farm milk analysis instruments**

After having described the attraction of external ideas and inventions to DeLaval and the firm-level effects of these processes, this section details the ways in which a number of such external ideas and inventions affected the development of a new product area for *on-farm milk analysis instruments*, which at the time of its introduction was new to both DeLaval and the industry as a whole. The study of this process outlines how external ideas and technologies from Danish start-up ChemoMetec and Danish incumbent Foss both played decisive roles in DeLaval’s creation of this new product category.

#### **Background**

For many years, milk analysis has been an important activity in the dairy industry. Historically, the analysis process has been carried out in central laboratories or on site at the dairies, which meant that the milk was either analyzed when it was collected at the dairy, or that milk samples were collected at the farms and then transported to laboratories for analysis. The primary purpose of milk analysis is to ensure that the milk has not been contaminated by germs and thus does not pose a health hazard. In addition, another important analytical parameter that developed over time was the identification of the number of white blood cells per milk unit, also known as the somatic

## Chapter 5

cell count of the milk. Essentially, cell count is a metric of the health of the cow that produces the milk. Cows that have a disease, such as mastitis, tend to produce more white blood cells, which results in a higher cell count in the milk. Because the cell count is considered to be an important parameter of milk quality, many dairies pay bonuses to dairy farmers based on the cell count of the milk that they deliver, i.e., a lower cell count earns the farmer a higher milk price.

Historically, milk analysis had long been a part of the dairy industry value chain in which DeLaval played no part. Instead, the dominant actor in milk analysis had long been the Danish firm, Foss, which supplies central laboratories and dairies with expensive and sophisticated testing equipment. In the early 1990s, however, DeLaval began to take some interest in milk analysis, as the issues of milk quality and food safety were becoming increasingly important concerns, and as the productivity of each cow was emerging as a key success factor for DeLaval's customers. However, DeLaval had no experience or expertise within this area and initially made no notable efforts to enter the milk analysis market. This was due largely to the company's lack of technological competence in the area, but also because it remained unclear what DeLaval's role in this part of the value chain could be, given Foss's market dominance.

### **The creation of instruments for on-farm milk analysis**

By the mid-1990s, a group of Foss employees led by Martin Glensbjerg and Frans Ravn began investigating new milk analysis methods that would make it possible to produce instruments at a much lower cost than the equipment the company was then selling to laboratories and dairies, and which could possibly open up new markets and new applications for milk analysis. However, the group's ideas received limited support within Foss. Soon afterwards, the group decided to break out of Foss and form a company, ChemoMettec, to pursue the concept of *low-cost milk analysis tools*. In addition to developing ideas for new technical solutions for milk analysis, the group had identified a need among dairy farmers to receive test results more quickly than the existing centralized systems for milk analysis would allow, since the milk had to be collected, transported and analyzed at an off-site location before the result could be returned to the farmer. The group further noted that if farmers could receive their test results more rapidly, it would make it possible to treat and ameliorate potential disease and other cow health problems

*Attraction: A new driver of learning and innovation*

at an earlier stage. For instance, this would mean that a cow that tested positive for mastitis could be treated immediately, significantly reducing the risk that milk production would be negatively impacted. A streamlined milk analysis system would also lessen the risk that milk with high cell counts would reach the dairy and reduce the bonus received by the farmer. The solution that the group envisioned in response to these needs was to provide an instrument for *on-farm milk analysis*.

However, the group had limited resources to back the development of such an instrument. In addition, they recognized that the distribution of products that targeted dairy farmers was heavily dominated by the large suppliers of milking systems such as DeLaval and WestfaliaSurge, and that it would be difficult to reach dairy farmers on an international scale without the support of one of these companies. Because of its position as the market leader, the group decided to approach DeLaval with their ideas. The issue eventually was directed to Ole Lind, who at the time held the position of coordinator for research at DeLaval in Tumba, and who agreed to a meeting with the group of former Foss employees.

The group did not have a prototype or physical instruments of any kind at this stage, and the solution they envisioned was still mainly a “paper product.” In order to convince DeLaval of the viability of their concept, the group had put together a document that outlined their vision of on-farm milk analysis, presented their preliminary ideas for how the cell count in milk could be measured in a new and more cost-effective manner, and offered an estimate of the size of the market for this type of product. Despite the early stage of the venture, Ole Lind immediately took an interest in the idea, and after a few more meetings, the parties signed a non-disclosure agreement. After additional development and testing, where the ChemoMetec team could show that its method was highly reliable and accurate, DeLaval in 1997 decided that the company should pursue the project.

Subsequently, an agreement was reached and a contract was established that structured the cooperation as *a licensing and joint development agreement*. The contract signed in 1998 stipulated that in the early phases of the project, the two parties would cooperate in the development of the product, but that ChemoMetec would retain the original patent. It was further determined that once the product had been taken to market, DeLaval would pay a licensing fee. The agreement also stated that in the development stage, the group from Che-



## Chapter 5

moMetec would take the responsibility for the development of the instrument as such, and that DeLaval would contribute the development and engineering resources that would be necessary in order to make it possible to manufacture the product on a large scale. In terms of what each of the two parties contributed, Uzi Birk, Senior Technical Director of R&I, explains that:

“The technology came from a startup company in Denmark, ChemoMetec. They are skilled technicians when it comes to milk analysis, and they had a good understanding of customers’ needs. The basic technology came from them and then we have developed it and contributed ideas for marketable applications.”

### The DeLaval Cell Counter

Throughout the development process, monthly meetings were held that alternated between Sweden and Denmark. Early in the process, a number of parameters and desired outcomes for the project were established, including product specifications such as reliability, dimensions, and target cost. After extensive development efforts, the product was ready to be launched in 2002. Known as the *DeLaval Cell Counter* (DCC), it was designed as a portable instrument that farmers can use anywhere. With the product, the entire milk analysis process is carried out by the user, who takes a sample by siphoning a small amount of milk into a disposable cassette inside the instrument. The milk is stained with a fluorescent reagent that enables an internal camera to count the cells individually. The result of the cell-count process is displayed 45 seconds after the insertion of the cassette. The product consists of the instrument itself and disposable cassettes for analysis (one cassette is required for each analysis). Therefore, the sale of an instrument constitutes a one-time revenue, whereas the sale of the disposable cassettes creates a continuous revenue stream.

Over time, a number of refinements, accessories, and additional applications have been added to the initial product.<sup>91</sup> In addition, a new product called the *Online Cell Counter* (OCC), which is an automated version of the DCC, has been developed based on the same

---

<sup>91</sup> Today, for instance, farmers can choose to purchase a software package called the DeLaval Database Kit DCC, which makes it possible to store data from previous cell counts on a PC and to produce lists, graphs, and reports customized to suit each farmer’s needs.

### *Attraction: A new driver of learning and innovation*

underlying method of analysis. Whereas the DCC requires the user to collect milk samples manually, the OCC automatically takes a sample from each cow each time it is milked. Notably, the OCC is not a standalone product like the DCC, but rather, is used as a selling point when promoting the company's Voluntary Milking Systems and thus fits well with DeLaval's strategy of supporting its customers in their ongoing efforts to maximize the health and productivity of their herds.

#### **The creation of the Herd Navigator**

An unanticipated effect of the collaboration with ChemoMetec was that the partnership triggered the interest of market leader Foss. In 2001, word was starting to spread within the industry about DeLaval's move into sensors and instruments for milk analysis. This news was met with concern by Foss, as it meant that the company faced the risk of losing a potentially significant part of the milk analysis business, one that in the future might also threaten to disrupt the company's existing revenues as the point of gravity in the milk analysis subsector moved from centralized solutions to decentralized solutions based around the concept of on-farm milk analysis. As a result, the management at Foss contacted DeLaval to request a meeting at which possible partnerships could be discussed. The meeting took place at DeLaval's headquarters; those present included the CEOs of both companies, along with DeLaval's Ole Lind and the R&D directors of both firms. During this meeting, an agreement was made that both firms would cooperate in the development of a new generation of milk analysis instruments. The Foss representatives presented ideas about online automated milk analysis, i.e., solutions that would allow the results of an automated milk analysis procedure to be transferred directly to a computerized database, a concept that would eventually emerge as the foundation for the partnership.

It was determined that the partnership would be structured as a joint venture, i.e., an entirely new company of which DeLaval would own 50% and Foss the other 50%. The new company was given the name Lattec, and it was agreed that all of DeLaval's efforts within the area of milk analysis, except for the above-mentioned cell counter instruments, would be channeled into the new company. All development activity would take place within Lattec, and both owners would contribute knowledge resources and expertise. Specifically, Foss contributed its technological expertise in milk analysis, whereas DeLaval

## Chapter 5

contributed its in-depth knowledge of dairy farmers, as well as its expertise surrounding the process of milk extraction. Uzi Birk, Senior Technical Director of R&I, explains that:

“They had the idea of analyzing milk online; that is their idea. Their contribution is the technology for analyzing milk and their process knowledge of how to handle and transport milk to the instrument. Our contribution is the application knowledge.”

In addition to this, the chief factors that made DeLaval an attractive partner for Foss was its distribution network and its relationships with farmers. Ole Lind, Director of R&I, describes the initial meeting:

“They [Foss] said that they wanted to cooperate with [DeLaval] because the products of the future will be sold to the farmers. They said, ‘You are good at selling and we believe that we are good at developing technology for analyzing milk.’”

### A significant technology leap

Lattec was formed in 2001 and was located in Hillerod, Denmark; three of the board members were appointed by DeLaval and the other three by Foss. The system that ultimately was developed by Lattec was given the name *Herd Navigator*, and it was designed to support the decision-making processes of farmers within a number of key areas using information gleaned from analyzing the milk of individual animals.<sup>92</sup> The system is also intended to support and improve cow health and to raise productivity in a number of key areas. Some of the areas about which the Herd Navigator provides information include: the detection and treatment of diseases, the timing of insemination for improved conception rates, and the optimization of feeding schedules and practices. All of these factors have the potential to increase productivity in various ways, such as by minimizing produc-

---

<sup>92</sup> In short, milk samples are collected and transported to the milk analysis instrument. In the instrument, milk is analyzed according to four parameters. The data gleaned from the analysis are then transferred and processed in a computer. A key component of the system is the so-called *bio-model*, which is important in helping users to interpret the data and make more informed animal care and treatment decisions. The bio-model does not provide diagnoses per se, but it does provide information about risk levels for different types of diseases and conditions. The farmer uses this information to make decisions about whether to start a particular course of treatment or to take any other preventive or precautionary measures.

### *Attraction: A new driver of learning and innovation*

tion loss related to illness and disease, by lengthening the average lifespan of each cow, by increasing the reproductive capacity of the cow population, and by increasing milk production through optimal individualized feeding.

The Herd Navigator was introduced to the market in late 2008, and at the current juncture, its market impact, commercial viability, and overall sales success remain unclear. However, Lattec's hopes for the product are ambitious, in the sense that the company will attempt to establish the Herd Navigator as a world standard that will be used in both DeLaval installations and in other manufacturers' milking systems in the long term. In terms of the product's potential and the radical innovation it represents, Uzi Birk, Senior Technical Director of R&I, suggests that:

“VMS and the Herd Navigator represent the biggest technological leap that DeLaval has ever made.”

★ ★ ★

In sum, the presentation of the micro-level case study illustrates how external impulses have enabled DeLaval to enter new product areas and to develop new technological competencies. More generally, it demonstrates how DeLaval's superior distribution system and existing customer relationships in the industry tend to channel new ideas that emerge within the industry to DeLaval, as the external innovators seek to commercialize their ideas and inventions.

#### **5.1.4 Summary and within-case analysis**

The case findings reported in the previous section show that the attraction of external ideas and inventions plays a non-negligible role in the company's innovation and product development processes, and that external impulses attracted to DeLaval have initiated the creation of new product areas such as systems for on-farm milk analysis. However, the findings also indicate that there are significant differences between different product areas within the company in terms of how much they can benefit from the inflow of external impulses. In this section, these and other findings related to how DeLaval is impacted by external impulses are analyzed and discussed. The case findings are also summarized in Table 5.1.

## Chapter 5

### Combining DeLaval's generic resources with specialized external ideas and resources

One overarching reason why DeLaval can benefit from attracting external ideas and inventions is that the company has *a large and diverse customer base*, as well as *a broad product portfolio* that is built on *a number of different technologies*. The diversity of the company's products, its underlying technologies, and its customers makes it difficult for the company to possess specialized knowledge in all relevant areas in terms of harboring the requisite technological capabilities and identifying latent customer needs that can be translated into new product ideas. As a result, external innovators who specialize in a narrow segment of the market or a specific technology domain related to a certain product, as well as firms from other industries whose technologies can be applied to dairy farming products, can help DeLaval develop its product portfolio. Uzi Birk, Senior Technical Director of DeLaval, explains with regards to external innovators:

"They often know the market better than we do. Sometimes it is a very limited and narrow area, but they know it very well."

These external innovators are in turn often dependent on the support of DeLaval (or possibly one of DeLaval's large competitors) because it is, as shown in Table 5.1, very difficult to commercialize new products in this industry without having a worldwide distribution network, such as DeLaval's, in place. Significantly, these external innovators often are not readily visible for DeLaval, either because they are small, new companies with low visibility or because they originate in a different industry. Whereas this in itself makes it challenging for DeLaval to identify sources of externally produced innovation and knowledge from which the company could benefit, the difficulty for DeLaval of identifying the relevant actors is reinforced by the fact that DeLaval has relatively limited resources dedicated to technology scouting or other methods of systematically searching for new technologies and product ideas. As a result, it is frequently the external actors themselves that make the connection and identify the ways in which their specialized knowledge and associated product ideas can be combined with DeLaval's broader and more generic capabilities in the development, production, and distribution of appliances for dairy farming.

## *Attraction: A new driver of learning and innovation*

**Table 5.1 Within-case analysis of DeLaval**

	<i>Findings</i>	<i>Quote</i>
Importance of attraction	Relatively high (but dependent on the product area)	<p>"We are convinced that we are dependent on getting an external inflow of ideas that can then be confronted with internal ideas." (Hans Holmgren, Director of R&amp;I)</p> <p>"The milking we can handle pretty well on our own, but the added services, there we are definitely assisted by ideas from the outside." (Tor Bratland, Director of Product Portfolio)</p>
Effects of attraction	<p>Infuses creativity into DeLaval's innovation processes and stimulates broad exploration of new ideas</p> <p>Creates opportunities to grow into new product areas</p> <p>Fills gaps in DeLaval's existing product portfolio</p> <p>Promotes learning about specific technological problems</p>	<p>"It is extremely important because it frees up creative resources that have not yet become subject to the limitations and restrictions of the company's internal innovation system." (Hans Holmgren, Director of R&amp;I)</p> <p>"It is exciting for us – it gives us opportunities to grow." (Tor Bratland, Director of Product Portfolio)</p> <p>"Once you have a customer, it's all about retention, and then it comes down to having a broad and attractive assortment of products. You fill out all these gaps." (Göran Karlsson, Director of Farm Supply and Barn Equipment)</p> <p>"If someone comes [along] with an idea and you realize that it's not going to work, you might still look at it to see how far it can be taken. Even though it doesn't work all the way, you can still learn something." (Torbjörn Petterson, Senior milk extraction specialist)</p>
Factors influencing the importance of attraction	<p>Diverse product portfolio and heterogeneous customers</p> <p>Distributed innovation in the industry</p> <p>Maturity of the product area</p> <p>Centrality of product area (core or peripheral)</p> <p>System or stand-alone product</p>	
Approach to attraction	Passive	"We don't go out with a message on our website where we invite people to come to us with ideas." (Hans Holmgren, Director of R&I)
Factors creating attraction	<p>Global distribution network</p> <p>Visibility</p> <p>Perceived trustworthiness</p>	<p>"It's distribution. We have this global distribution network. You have very little chance of succeeding in the market unless you [partner with] companies like DeLaval and get help with the distribution." (Göran Karlsson, Director of Farm Supply and Barn Equipment)</p> <p>"It is well known that we are the world's largest manufacturer of milking equipment, and if someone comes up with a new way of milking, then it's pretty natural that they come to us." (Ole Lind, Director of R&amp;I)</p> <p>"It about finding contractual forms and creating a basis for trust." (Hans Holmgren, Director of R&amp;I)</p>

## Chapter 5

The case analysis suggests that this pattern of external actors identifying combinatorial opportunities between themselves and DeLaval can be explained by the fact that DeLaval as a company, unlike many of the external impulse providers, is *highly visible* within the field of dairy farming, and importantly, that *the company's key resources, worldwide distribution network, and competency in manufacturing products for dairy farming are commonly known across the industry*. Because everyone in the industry is aware of DeLaval's key resources and capabilities (whereas the specialized ideas or technologies that external innovators possess typically are deliberately *kept secret*, and therefore constitute *private information*), it seems more likely that external actors will be positioned to identify combinatorial opportunities and approach DeLaval than vice versa.

This in turn leads to that DeLaval receives external impulses that contribute to informing the company about new ideas, technologies, and opportunities that it could not have identified through its own search processes, and hence otherwise would have overlooked. Notably, the creation of DeLaval's new product area for on-farm milk analysis instruments represents an example of this pattern, whereby an external actor identified an opportunity that involved DeLaval and that the company itself had failed to identify.

### **Different types of impulses and processes**

In other words, the inflow of ideas and technologies provided by external actors represents a source of creativity and inspiration for the development of new products in DeLaval, and attraction constitutes *an exploration mechanism* through which DeLaval becomes exposed to new product ideas and technologies that lie outside its current competencies, and which are *not captured by its own search processes*. Importantly, however, even though attraction represents a significant source of creativity and novelty for the company, it is essential to note that many of the impulses that DeLaval attracts do not contain the same high degree of innovation and novelty offered by the concept of on-farm milk analysis, which represented the seed of a completely new type of product that was based on a new technology. Instead, the case findings demonstrate that the attracted impulses vary significantly in terms of the extent to which the ideas diverge from DeLaval's existing knowledge base. In effect, there are those ideas that contain a high degree of novelty for DeLaval and which are not aligned with its existing knowledge base, such as ChemoMetec's

*Attraction: A new driver of learning and innovation*

concept of on-farm milk analysis, but there are also impulses that represent a low degree of novelty and which are largely aligned with DeLaval's existing technologies and products, such as, for instance, a new type of detergent or an improved type of cow brush.

Whereas both types of impulses are of value for DeLaval, a number of differences are worth noting. First, it is clear that impulses with a high degree of new knowledge content are more difficult for DeLaval to adopt because they tend to contradict established ways of thinking or to be built on a different base technology, which means that they typically require extensive development in order to become commercial products. As a consequence of the difficulty and the resource commitment that this process requires, the study suggests that it is *relatively rare* that such impulses are adopted and developed into new products within DeLaval. However, as shown by the study of the development of on-farm milk analysis instruments, the ideas like this that are adopted can have a significant impact on the company in terms of driving radical innovation and enabling DeLaval to grow into new product areas.

Conversely, impulses that are largely consistent with DeLaval's existing knowledge base are easier to adopt and require much less resource commitment on DeLaval's part. Consequently, such impulses are more commonly adopted than those that diverge substantially from DeLaval's existing knowledge base. However, as a result of the low degree of new knowledge inherent in these impulses, each individual impulse tends to have a modest impact on DeLaval, in terms of adding revenues or modifying DeLaval's corporate strategy, and rather is more likely to fill minor gaps in DeLaval's existing product portfolio or to provide incremental improvements of existing solutions.

The case findings, in other words, demonstrate that DeLaval benefits in different ways from different types of external ideas and inventions. However, it is also apparent that the attraction of external impulses is not equally important in all of DeLaval's product areas and in all aspects of its innovation and product development processes. In response to this finding, in the following section, these differences will be analyzed and discussed in order to provide preliminary explanations that account for these differences.



### Differences in the importance of attraction

The case findings indicate that whereas the attraction of external impulses plays a limited role for the innovation in DeLaval's *core product areas*, most notably milking and cooling systems, it is of greater significance in the company's more *peripheral product lines* that are part of the company's aftermarket product portfolio. Based on the case analysis, a number of possible, and not mutually exclusive, explanations for these differences have been identified.

First, the case analysis suggests that the difference can be explained by *the relative competency levels* of DeLaval and its external impulse providers. Notably, because of the large revenues that DeLaval earns from its core product areas, the company can afford to invest significant resources in internal R&D to develop and sustain a technological leadership in these product areas, meaning that external impulse providers typically struggle to match DeLaval's internal competencies in these areas. This in turn means that these external providers often fail to offer ideas and technologies that are superior to DeLaval's existing solutions and internally developed technologies. As a result of this, external impulses that target DeLaval's core product areas are *seldom* adopted and the attraction of external impulses consequently has little impact on DeLaval's innovation in these product areas.

On the other hand, in DeLaval's peripheral product areas where the company has lower sales and therefore cannot justify similarly substantial investments in internal R&D, the company's competency level is not as high as in its core product areas. Consequently, in such areas, the relative advantage in expertise may weigh in favor of external actors, which means that it is not uncommon for external innovators to be able to outperform DeLaval's internally generated solutions and technologies. As such, external impulses in these areas get adopted more frequently and DeLaval can extract more value by attracting externally developed ideas and inventions in these peripheral product areas than in its core product areas.

Second, the inflow of external impulses is of greater value to DeLaval in its peripheral product areas because these generally are *stand-alone products*, whereas the core products are *system products*. It seems as if in DeLaval's milking and cooling businesses, the software-centric focus and the complex nature of the products render it difficult for external actors to understand how their ideas can be in-

*Attraction: A new driver of learning and innovation*

tegrated into the existing systems, which diminishes the likelihood that their ideas and inventions will be relevant for DeLaval. In addition, the system-like nature of the products makes the adoption and integration of external ideas challenging for DeLaval, as this process requires the company to engage in extensive additional development to make the ideas or inventions compatible with existing solutions.

On the other hand, in the aftermarket product area, external actors often develop new products that can easily be included in DeLaval's product portfolio without having first to undergo extensive adaptation. This both increases the chances that the external impulses are relevant for DeLaval and lowers the threshold for DeLaval to adopt the impulses, meaning that these external impulses are adopted more frequently and that the attraction of external ideas and inventions has a substantial influence on DeLaval's peripheral product areas, which are dominated by stand-alone products.

Finally, the case analysis suggests that these 'rational' differences between DeLaval's core product areas and its peripheral product areas may be exacerbated by an element of *over-confidence* among DeLaval managers with respect to the company's own expertise in its core areas. The findings suggest that this over-confidence tends to negatively bias the assessments that are made of the external impulses that pertain to DeLaval's core product areas, a tendency that does not seem to exist with respect to impulses related to its peripheral product areas (Katz & Allen 2007). The study further suggests that the "not-invented-here syndrome" is more likely to arise with respect to the company's core product areas than in its peripheral product areas, suggesting that potentially valuable ideas are more likely to be wrongly weeded out at an early stage in the core product areas. This in turn means that DeLaval is more likely to make the best possible use of the inflow of external impulses in its peripheral product areas than in its core product areas.

In addition to the differences between the core and peripheral product areas, the case findings suggest that the attraction of external impulses is more important for DeLaval in its *new product areas* than in its *mature product areas*.<sup>93</sup> As shown above, in the milk anal-

---

<sup>93</sup> Clearly, similarities exist between DeLaval's mature product areas and its core product areas, in the sense that its milking systems and cooling systems are both mature and core. However, the categories are not identical, since DeLaval's aftermarket product portfolio, for instance, represents a mature but peripheral product area, which suggests that it is appropriate to analyze these categories separately.

## Chapter 5

ysis product area, which is a new product area for DeLaval, the attraction of external impulses has been indispensable, whereas in its mature product areas, such as milk extraction, the inflow of external impulses is of limited importance. The findings suggest that this can be explained by the fact that DeLaval has been able over time to accumulate knowledge and develop superior technological expertise in its mature product areas, which renders it difficult for external impulse providers to compete with and outperform DeLaval's internally developed solutions. The long period during which DeLaval has had a leading industry presence in its mature product areas has also allowed the company to stretch the performance of the existing technologies, e.g., milk extraction based on vacuum and pulsation, close to their limits, which also makes it difficult for external actors to find obvious ways of improving these further.

Conversely, in its emerging product areas, such as instruments for milk analysis, the underlying technologies are not as finely developed, and DeLaval is *still learning about the market and the technologies*, which leaves more room for external actors to identify new technological solutions or market opportunities that have not been explored and pre-empted by DeLaval. This in turn makes the inflow of external impulses that DeLaval attracts in this area more relevant and valuable for the company, which means that the company can benefit more from attracting external impulses in its new, emerging product areas than in its mature product areas.<sup>94</sup>

★ ★ ★

What is notable, given this analysis, is that although it is in the company's mature, core product areas, such as milk extraction and cooling, that DeLaval *benefits the least* from attracting external impulses, and is in fact the least likely to adopt external impulses, it is in these

---

<sup>94</sup> These findings do not preclude the possibility that an external actor could invent a radical new technology in one of DeLaval's mature product areas and bring it to the company's attention. As shown by the case study, DeLaval is currently evaluating a new, externally developed technology for cooling which would represent a major technological shift in the company's mature cooling business. In the study, however, it has not been possible to identify any actual examples where DeLaval has attracted a radically new technology that has replaced an existing one, which suggests that such occurrences are rare.

### *Attraction: A new driver of learning and innovation*

areas that DeLaval attracts the majority of the external impulses that it encounters. This indicates that there is a certain mismatch between the areas within which DeLaval is indeed in need of help from the outside and the areas which external actors target as they approach DeLaval to present their ideas and inventions.

#### **A passive approach to attraction**

This last observation points to another notable finding, namely, that the differences between the product areas that were analyzed above are not reflected in any differences in DeLaval's behavior with respect to attraction. On the contrary, as shown in Table 5.1, DeLaval assumes a passive role with respect to attraction across all of its product areas. In effect, no attempts are made to stimulate the attraction of external impulses, to try to guide the inflow of external impulses, or to inform the outside world of the company's technology needs. Partly, this seems to be explained by the fact that DeLaval, because of its *firm grip on distribution in the industry* through its worldwide sales channels and its continuous contact with its customers through the service staff that regularly visit the customers, largely can afford to rely on that new ideas and inventions that surface in the industry ultimately will be channeled to DeLaval *even without any attraction-enhancing activities* on the company's part.

#### **Potential benefits of a more active approach to attraction**

The case analysis indicates that this passive approach to attraction is adequate to some extent as a large number of external ideas and inventions are indeed channeled to DeLaval, despite the lack of attraction-enhancing measures undertaken by the firm. However, it also suggests that a more active approach might further increase the benefits that DeLaval could potentially draw from the attraction mechanism. First, it seems that whereas the passive approach is largely sufficient to attract new things which originate *within* the industry, since DeLaval is so dominant and has such high visibility in the field of dairy farming, it also limits DeLaval's capacity to attract impulses from *outside* of its own industry. Because of the lack of activities intended to increase its visibility and build attraction beyond its immediate context, there is reason to believe that external actors that could potentially identify combinatorial opportunities between their own ideas and technologies have failed to do so because they are un-

## Chapter 5

aware of DeLaval and its products and technologies. This argument is also reflected in a statement by DeLaval manager Hans Holmgren:

“We are a relatively anonymous company, especially when you consider that we are the global leader in our industry. Sure, we are well-known within the industry, but we are not so well-known outside our industry. We should, in my opinion, make ourselves more publicly known in order to attract new ideas and the right people. It is not known that we work with advanced technologies, such as advanced vision systems and robotics. That should be made more visible and could also create an inflow of the right people and ideas.”

Second, as pointed out above, there is a certain mismatch between the product areas within which DeLaval attracts a large number of external impulses (e.g., its mature, core product areas such as milking and cooling systems) and the areas where it is indeed helped by external impulses (i.e., new and peripheral product areas). There is reason to believe that this mismatch could be reduced with a more active approach to attraction, whereby the company communicates externally about the areas within which it is on the lookout for new ideas and inventions, and hence provides a certain degree of direction to potential impulse providers about which areas they should target when they approach DeLaval to present new ideas and inventions.

★ ★ ★

In sum, this section outlines how and why DeLaval can benefit from attracting an inflow of external ideas and inventions. It suggests that the high visibility of DeLaval and its key resources enable external actors to identify combinatorial opportunities between their own ideas and DeLaval’s resources and capabilities, which leads to an inflow of external ideas and inventions into DeLaval. It further shows that this has resulted in the creation of entirely new product areas, as well as the development of additional products in DeLaval’s existing product areas. As summarized in Table 5.1, the analysis further outlines a number of factors which seem to influence the extent to which attraction is valuable for DeLaval. Finally, it discusses DeLaval’s passive approach to attraction, and suggests that even though this approach is sufficient to attract significant numbers of external impulses, there is reason to believe that a more active approach would allow DeLaval to realize greater benefits from attraction.

## **5.2 Autoliv and the automotive safety industry**

In the automotive industry, Autoliv holds a position as a large, so-called *first-tier supplier*, which means that the firm delivers its products and systems directly to car manufacturers. The case study shows that as a consequence of holding this position in the industry structure, Autoliv often gets approached by smaller companies and inventors who are trying to get their ideas, products, or technologies included in the vehicles developed by the leading car manufacturers. However, the case description also suggests that it is relatively rare that these external ideas and inventions actually lead to the development of new products or solutions, because the nature of Autoliv's products and the way product development is conducted in this industry make it difficult for external innovators to compete with the internal R&D activities conducted by Autoliv, which is reflected in this observation from the company's former Vice President of Engineering, Sture Andersson:

“It is very hard to come from the outside and come up with better ways of doing things. In a way, you don't need this inflow very much, because you have so many ideas internally, of which you can only realize a small fraction anyway.”

In the case description and case analysis to follow, I describe the ways in which new products and strategies are developed in Autoliv. I specifically focus on how the inflow of external ideas and inventions fits into these processes and outline some of the reasons why the inflow seems to be of limited importance for Autoliv's innovation and strategy development.

### **5.2.1 The context**

#### **The company and its products**

Autoliv Inc. is the global leader in the automotive safety system industry. In 2008, the company had an annual turnover of 6 473 million USD and a workforce that numbered 34 000.<sup>95</sup> The company emerged in its current form after a 1997 merger that fused the leading European automotive safety company, Autoliv AB of Sweden, and

---

<sup>95</sup> Autoliv (2009).

## Chapter 5

the leading airbag manufacturer in North America and Asia, Morton ASP. Autoliv's primary customers are car manufacturers, and the company today supplies all of the major car companies in the world, which means that the company has a presence on all continents. European customers account for the majority of its sales, followed by North America and Japan. Autoliv's major competitors are the American automotive supplier TRW Automotive and the Japanese automotive safety system firm Takata.

Autoliv's core business is in *the automobile occupant restraint market*, which is constituted by the main product areas *seatbelts, airbags, and electronics*. In total, this is estimated to be an 18.5 billion USD market, with frontal airbags accounting for 28%, side airbags 27%, seatbelts 27%, and electronics 18%. According to Autoliv's own estimates, the company holds slightly more than one-third of the total occupant restraint market, with a somewhat higher market share in airbags than in seatbelts.<sup>96</sup> Each of these product areas contains sub-segments and components, such as pre-tensioners and load limiters for seat belts, and gas generators and different types of cushions for airbags, such as frontal airbags and side airbags. Autoliv's sole original product offering was seatbelts, but the company has over time evolved into becoming a full-range supplier of safety systems, including innovative seatbelt solutions, various types of airbags, and a range of electronic components designed to control automotive safety systems.

In response to the recent maturation of its current markets for seatbelts and airbags, Autoliv has also extended its product portfolio by entering the market for *active safety systems* that are designed to prevent accidents, as opposed to only alleviating the effects of a crash, which is the role played by seatbelts and airbags (known as *passive safety systems*). Autoliv's primary product in the active safety system market is its night vision system, which uses infrared technology to help nighttime drivers detect objects in front of the vehicle. However, while identified as a potentially important area for the future, this product still only accounts for a marginal share of Autoliv's total sales.<sup>97</sup>

---

<sup>96</sup> In addition to occupant restraint products, Autoliv has also been a leading manufacturer of steering wheels since entering the market in 1995. However, these products account for a limited share of Autoliv's total sales.

<sup>97</sup> Johansson (2007).

**Autoliv and its role in the multiple-tier supplier structure of the automotive industry**

As mentioned previously, Autoliv's main customers are the large automobile manufacturers, and the company is hence considered to be a part of the larger automotive industry. This industry is characterized by its strictly organized sub-supplier system, which is often referred to as a multiple-tier structure. In this system, each firm has a clearly defined role, and car manufacturers tend only to interact with their first-tier suppliers, who source components from second-tier suppliers, who in turn source components and raw materials from third-tier suppliers. Because car manufacturers are its direct customers, Autoliv is hence a first-tier supplier. A strong industry trend has seen most car companies seeking to reduce the number of first-tier suppliers from which they buy, while at the same time relying more heavily on their remaining stable of first-tier suppliers. As such, first-tier suppliers are expected to assemble and deliver fully functioning systems or modules, which can then be relatively easily integrated with other modules at the car companies' assembly facilities.

This means that the first tier-suppliers have been expected to take an increasingly central role in the development and engineering of new systems. As a result, many of the first-tier suppliers have evolved into engineering powerhouses with access to extensive R&D resources. This is also true for Autoliv, which employs approximately 4,000 engineers and spends close to six percent of its annual turnover on research, development, and engineering in order to be able to develop and deliver complete safety systems to the car manufacturers.<sup>98</sup> However, although Autoliv assumes a significant degree of responsibility for the safety features of the cars sold by manufacturers, much of its development and engineering efforts take place in close cooperation with the car makers. The relationships in the industry are generally maintained on a long-term basis and accumulated knowledge is, to a certain extent, shared among first-tier suppliers and car manufacturers in the intersections and cooperative partnerships between the companies.

---

<sup>98</sup> Autoliv (2009).



### The organization of R&D in Autoliv

The R&D system in Autoliv is divided into two parts. First is *Autoliv Research*, headed by the Vice President of Research Jan Olsson and located in Vårgårda, Sweden. In addition, the Engineering unit is led by Vice President of Engineering Steven Fredin, and is divided into two parts, *Development* and *Application Engineering*. The development activities are largely centered in a number of technical facilities in France, Germany, Japan, Sweden, and the United States, whereas application engineering activities are even more decentralized, with units located near virtually all the production sites maintained by Autoliv's customers. On a general level, Autoliv Research is responsible for developing new safety systems and technologies to support these new systems, whereas Development is responsible for fostering innovation within the confines of existing systems and technologies, as well as developing the new concepts that Autoliv Research generates into functioning systems. Application Engineering, in turn, is responsible for the continuous improvement of existing products, as well as the customization of the generic systems for the different car makers and car models.<sup>99</sup>

### New product ideas: Research and customer collaboration

With respect to the generation of ideas for new safety systems, the study suggests that the identification of new opportunities and the sourcing of ideas for new innovations in Autoliv are largely built on two pillars: (i) the analysis of actual accidents, and (ii) close cooperation with the company's customers, the car manufacturers.

Jan Olsson, Vice President of Research, explains that a chief characteristic of the way innovation and R&D is carried out within Auto-

---

<sup>99</sup> When it comes to the development of new safety systems, the formal division of labor between the departments is such that Autoliv Research develops concepts for new systems and, in some instances, prototypes. These are then handed over to the Development unit, which develops these further into generic systems that are fully functional, but are not yet adapted and tailored to a specific customer or car model. Once the concepts are offered to a customer or deemed ready for production, Application Engineering takes over and begins to collaborate with the target customer to adapt the generic systems to a specific model or application. Further, in the process of continuous improvement of existing systems, the engineering units remain in constant contact with customers, and play an important role in monitoring what is happening within and around the customers, paying particular attention to local markets, problems, needs, and emerging technological opportunities.

*Attraction: A new driver of learning and innovation*

liv is that it is tightly linked to the analysis of actual accidents in real-world traffic situations:

“We don’t just sit around and brainstorm ideas – it doesn’t happen like that in our industry. It requires a more systematic approach and a great deal of background knowledge to come up with a successful product.”

Autoliv’s research includes both micro-level studies of individual accidents and macro-level studies of large numbers of accidents. The micro-level analyses provide Autoliv with information about how their products can be designed to alleviate the types of injuries suffered in the accidents, whereas the macro-level studies, which consist of statistical analyses of accident databases, indicate what the most common types of accidents are and how priorities should be set within Autoliv when allocating resources to the development of new safety systems.<sup>100</sup> With respect to how the research activities result in the development of new ideas and concepts, Jan Olsson, Vice President of Research, stresses that once such studies have been carried out, ideas for new types of safety systems are often fairly obvious.

“This means that the ideas for new systems can come pretty naturally once you understand the background. You don’t need to rely as much on creativity, because all the pieces may fall naturally into place if you know what the reality of auto accidents looks like.”

In other words, Olsson suggests that the identification of ideas for new safety systems can be the result of simply understanding the nature and frequency of different accident types; once this fundamental knowledge is in place, innovation is largely a matter of leveraging the firm’s engineering capabilities and devoting sufficient engineering resources to transform the identified opportunity into a functioning product.

---

<sup>100</sup> A key area of Autoliv’s new safety systems research is sensor technology, as sensors that can detect a crash before the actual impact occurs have become increasingly important as safety systems have become more “intelligent.” Another key area of research is electronics, since a key element of Autoliv’s safety systems is the Electronic Control Unit (ECU), which serves as the “electronic brain” of a car’s safety system, determining when each airbag should be released and when the pretensioners of each seat belt should be deployed. As a result of its increased interest in active safety systems, Autoliv also conducts research within the realm of Human-Machine Interaction (HMI), which focuses on how people tend to act and behave while driving.

## Chapter 5

As emphasized previously, in addition to the supply of new ideas and concepts originating from research and systematic accident analysis, close interaction with key customers such as BMW, Mercedes, Volvo, and Renault represents a major source of Autoliv's ideas for new safety systems. Autoliv's engineering teams that are present at the car companies' assembly facilities are well-positioned to be able to acquire in-depth knowledge about the customers and their emerging problems and needs. By channeling this information back to the Research and Development units through an internal reporting system, Autoliv ensures a constant flow of ideas for new systems. With respect to the provision of ideas for new systems, Autoliv's close collaboration with Volvo Cars has historically been particularly important.<sup>101</sup> With respect to the creation of ideas for new systems, Sture Andersson, former Vice President of Engineering, explains that:

"It comes from being in the industry. If you have as close a level of cooperation with Volvo as we do, then [the ideas] sometimes comes from Autoliv, sometimes from Volvo. It is like when you are together in a small group and come up with new things; sometimes you can't tell afterwards exactly who came up with what."

### 5.2.2 Autoliv and the attraction of external ideas and inventions

#### Who approaches the company and what is their motivation?

In addition to its high degree of interaction with its customers, Autoliv attracts a limited but continuous stream of ideas and inventions from external actors. This group of external actors that approaches Autoliv consists of both independent inventors and smaller technology-based firms. The impulses originate from different places around the world and some of these impulse providers approach the centralized R&D units in Sweden, whereas others talk to the local company or the local technology centers. In the latter case, impulses that make it through the first round of screening at the local level are channeled back to the central R&D unit in Sweden through the reporting system overseen by the Development organization, which was described pre-

---

<sup>101</sup> High-end firms such as Mercedes, BMW, and Volvo cultivate an image of being industry leaders in car safety and are often early adopters of new safety systems. As such, these firms are prepared to take part in the development of the new systems and also to order them at an early stage of development, when volumes are still low and the systems are, therefore, still expensive.

*Attraction: A new driver of learning and innovation*

viously. However, a large proportion of the impulses originate in Sweden, which Jan Olsson explains as a function of the fact that Autoliv is a visible and widely known company in Sweden, because it is listed on the Swedish stock exchange and has its corporate headquarters in Stockholm.

The motives that compel external actors to approach Autoliv often result from structural features of the automotive industry, which makes it necessary for smaller actors who seek to commercialize an idea to go through a large firm. Jan Olsson, Vice President of Research, explains that:

“To industrialize your ideas on your own is difficult, so they tend to come to us at some stage. It may be that they only have an idea, or a patent, or that they have proceeded even further, but they feel that they won’t make it all the way [without our help].”

In order to commercialize a car safety product, it is necessary that it be accepted by a major car manufacturer who is willing to include it in one or more of their models. However, this study suggests that this can prove to be extremely difficult for a number of reasons. First, as emphasized by Lotta Jacobsson, biomechanics researcher and technical specialist at Volvo Cars, a small firm or an independent inventor cannot realistically hope to develop a product that can be directly integrated into a car model, due to the extensive engineering efforts that are required to turn an idea or prototype into a safety product that is fully integrated with the other systems of the car.

“They can never construct anything that can be put right into the car. There are too many demands that need to be satisfied and there is a massive engineering process that underlies all new products.”

Second, the existing multi-tiered structure of the industry means that it is generally not possible for a small firm or an independent inventor with a technology or an idea for a new car safety product to approach the car company directly. As alluded to previously, the car companies expect to buy complete systems (modules) and they prefer to work with their existing suppliers, which have a proven track record of reliability and timely deliveries. Both of these factors are crucial considerations in the car industry, as delayed launches of new car models and recalls of existing cars with defects can both be extremely costly. For safety products, system reliability standards are very high,

## Chapter 5

since any flaws could have severe consequences for the passengers, and lead to lawsuits and negative reputation effects for the car company. Consequently, automakers typically are not interested in buying new stand-alone products or interacting with actors other than their existing first-tier suppliers. For these reasons, an actor with a new idea or technology but without existing ties to the car companies generally needs to seek out the support of one of the large first-tier suppliers such as Autoliv, and since Autoliv is the leading supplier of car safety systems, the firm is the natural choice for many such actors. As Henrik Kaar, Director of Corporate Communication, explains:

“If there is a small company that wants to establish itself in the industry, the best way is to enter through a supplier, because we have the contacts and the systems. It is hard for anyone who is not currently a supplier to get access to the car manufacturers.”

In sum, it is clear that because of its position as the global market leader in car safety systems and as a first-tier supplier with direct access to the car companies, Autoliv is an attractive partner for many smaller firms, entrepreneurs, and inventors, which means that ideas for new products or technologies related to car safety tend frequently to be channeled to Autoliv.

### **Type of impulses**

The impulses that Autoliv attracts are in different stages of development; some are merely ideas, whereas other are fully developed and patented technologies. These impulses are usually designed specifically for the car safety industry, and it is rare that firms from other industries approach Autoliv with the aim of transferring ideas or technologies from their industry to Autoliv's domain. The areas at which the impulses are targeted tend to track the development of Autoliv's existing product portfolio, meaning that many of the ideas and inventions brought to the company's attention have traditionally been related to seatbelts and airbags, whereas an increasing number of the more recent impulses have been electronics-related. Since Autoliv launched its night vision system, the company has also attracted an inflow of external impulses related to that area.

When comparing the composition of the inflow of impulses that Autoliv attracts with the flow of internally generated ideas, Jan Olsson, Vice President of Research, makes the observation:

### *Attraction: A new driver of learning and innovation*

"I would say that the ideas that come from the outside are more diverse. There are ideas about how to design systems for warning the driver about icy road conditions, or sleep warning systems for drivers. There are plenty of ideas that lie outside of what we normally do, but which still find their way to us."

This suggests that the external innovators that approach Autoliv are influenced by the existing products that Autoliv sells, but that they are shaped less by Autoliv's existing product areas and the associated technological trajectories than are the R&D personnel working with product development inside Autoliv, which implies that the external impulses therefore are a source of diversity and variation.

#### **How is Autoliv affected by the inflow of external ideas and inventions?**

From the previous section, it can be concluded that the attraction mechanism generates more diverse and unrelated ideas than do the company's internal innovation processes. The case findings however also suggest that the inflow of external ideas and inventions is of modest importance to Autoliv, and that the ideas and inventions that Autoliv attracts are of limited significance compared to the innovation that is created through internal R&D and collaboration with the car companies. With respect to the inflow of externally developed ideas and inventions, former Vice President of Engineering Sture Andersson explains that:

"Independent inventors approach us quite often and that is interesting. Unfortunately, they have a hard time coming up with anything truly novel, because we do so much [research and development] internally."

As such, it is perceived within Autoliv that external innovators typically struggle to compete with the company's internal innovation and that externally developed inventions play a limited role in Autoliv's innovation and product development processes. Hugo Mellander, CEO of Traffic Safety Research and Engineering, confirms the notion that Autoliv makes relatively little use of externally developed ideas and inventions and that it is difficult for external actors to get their ideas adopted by Autoliv:

"It is very difficult today. They are very tight -- Autoliv, Saab, and Volvo -- with their designated suppliers, so for a small actor to enter is indeed very difficult."

## Chapter 5

In terms of externally developed ideas or inventions that have had a major impact on the development of a new product, the Anti-Whiplash Seat, which is described in detail in the next section of this chapter, represents one of only a few significant examples.<sup>102</sup>

A number of reasons emerge from the study as possible explanations for why the inflow of attracted impulses is relatively unimportant for Autoliv. Most significantly, it is argued from Autoliv's side that the knowledge held by the external actors who approach Autoliv is not sophisticated enough to match the innovation that takes place internally, fueled by the 4,000 engineers employed by the company. Specifically, Jan Olsson, Vice President of Research, emphasizes the firm's systematic approach to innovation based on the analysis of accident databases as a core explanation for why external actors struggle to compete with Autoliv's internal innovation. He suggests that the external actors who approach Autoliv are at a disadvantage because they typically do not have the resources to carry out systematic research about accidents, injuries, and the human body:

"The difficulty of this industry is that many of the problems and challenges are not known to the public. . . [They] require that you work with accident analysis to understand the problem. Otherwise, it is sheer speculation about what the accident situation is like."

Maria Krafft, traffic safety specialist at Folksam, further underscores the need to have access to crash test laboratories, which few very few external actors can afford to maintain.

"It requires access to a crash test laboratory and so much testing [to develop a new safety system]. Even if you have good idea, you need to be able to conduct tests and learn additional things along the way. Very few actors have access to test labs and the opportunity to engage in such trial-and-error learning."

As a result of this, it is commonly perceived among Autoliv managers that the impulses that originate among external actors are often of low quality and typically cannot add significant value to Autoliv in terms of providing new knowledge. However, despite these factors that make external innovation problematic, it is also acknowledged among the R&D managers at Autoliv that even if the vast majority of

---

<sup>102</sup> Other examples are more recent than the Anti-Whiplash Seat, and as such, Autoliv representatives preferred not to disclose any information about these cases.

*Attraction: A new driver of learning and innovation*

the impulses contain little value, there are external ideas and innovations that are truly novel and prove to be interesting to Autoliv. As Jan Olsson, Vice President of Research, states:

“You can say that one in a hundred is interesting, and then it’s about finding that one.”

In other words, even though most within the company perceive the average quality of the impulses that Autoliv attracts to be low, they still recognize that proverbial “gold nuggets” exist that they do not want to risk missing out on, and consequently, they try to take external impulses seriously and devote time to meeting with inventors and entrepreneurs who have approached Autoliv with new ideas, concepts, or technologies. In terms of the value that the rare viable impulse can bring to Autoliv, it is clear from the study that none of the external actors that have approached Autoliv have ever developed a fully functioning product that Autoliv can incorporate immediately into its own safety systems. Even the best ideas and inventions require extensive engineering by Autoliv in order to be turned into products that can be mass-produced with the stringent reliability criteria that are required of car safety systems. Therefore, the potential contribution of an attracted impulse most often lies in the early stages of the development process. Mats Lindquist, a car safety specialist at SAAB Automobiles, explains that:

“What entrepreneurs and inventors can do is make the large companies aware of a problem, but they rarely bring the final solution to the problem. The innovation often consists of a unique way of describing and defining a problem.”

As such, it is clear that externally developed ideas or inventions can provide inspiration to fuel Autoliv’s own innovation process, in the sense that they bring new areas of research or development to the attention of Autoliv, or they introduce new ideas for solving existing problems that can redirect Autoliv’s own search and development efforts. Because external impulses typically can make the most significant contribution early in the development process, the most common arrangement that results when Autoliv takes an interest in an externally developed idea or innovation is that the company will purchase the underlying patents, but conducts the additional adaptation and development internally, without any further involvement



## Chapter 5

from the external innovator. Speaking from the perspective of the external innovator, Hugo Mellander, CEO of Traffic Safety Research and Engineering, explains that:

“The best chance you have is if you have a product that is really good -- they may decide to buy your patent and then conduct their own development based on that.”

In addition to the instances in which Autoliv adopts the external idea or innovation by purchasing the underlying patent, the case study also indicates that even those external impulses that are not adopted may prove to be beneficial for the company. Specifically, the case findings suggest that a further effect of the inflow of impulses through the attraction mechanism is that the meetings where external innovators present their ideas to the Autoliv managers can trigger a general learning process within the company even if the idea is not adopted. Sture Andersson, former Vice President of Engineering, explains that:

“It is always useful to discuss new ideas. It stimulates your own thinking. I’m a firm believer in having plenty of communication if you want successful product development.”

With respect to how Autoliv is influenced by the inflow of externally developed ideas and inventions, the study hence suggests that most external impulses are rejected by Autoliv, with the exception of a smaller number of particularly interesting ideas or inventions. However, the interaction with the external innovators exposes the managers in Autoliv to a more diverse pool of ideas and perspectives than what is available inside the organization, which at times can re-direct the firm’s attention into new areas and stimulate the creation of new knowledge.

### **The evaluation and interaction process**

A further aspect of the inflow of externally developed ideas and inventions is understanding how these are evaluated by Autoliv and identifying the ways in which the company interacts with the external actors that furnish ideas and inventions. The study suggests that propositions often reach the acting leaders of either Research or Engineering, who in turn tend to conduct preliminary screening via a phone call, as well as by assessing the documentation and support-

*Attraction: A new driver of learning and innovation*

ing materials in which the external party has described the idea. If this evaluation reaches a favorable conclusion, a face-to-face meeting is scheduled. A key issue at this stage is determining whether the idea is protected by a patent, since proper patent protection can greatly facilitate the interaction and evaluation process. On the other hand, if the idea is not protected by a patent, a number of transaction-related problems tend to arise. Jan Olsson, Vice President of Research, explains that:

“There are, unfortunately, many situations where the inventor or the one who has the idea does not want to tell us about it, and then the process hits a dead end, because I can’t sign a confidentiality agreement and the other party does not want to reveal more without an agreement, and then we get stuck.”

Such a lack of trust on the part of the external actor, in combination with Autoliv’s frequent reluctance to sign confidentiality agreements<sup>103</sup>, can hence prove to be significant impediments in the collaborative process. However, external innovators who have a patent can largely eliminate these problems, since a properly formulated patent protects the idea and allows the inventor to be able to freely describe the idea in detail, without the fear that it can be appropriated by the company without legal repercussions. A patent also facilitates Autoliv’s evaluation of the idea, since it facilitates the assessment of the novelty of the idea and the risk that the idea infringes on other patents. Independent inventor Bo Swedenklef, who focuses primarily on car safety products, emphasizes that he only initiates a contact with Autoliv or any other large company if he has a patent that is either pending or already granted. He further emphasizes that he believes that the quality of the patent is crucial for the chances of closing a deal with a large company:

“If the patent is sufficiently well-written and covers all variations then it hopefully will lead to a deal.”

---

<sup>103</sup> Autoliv is generally reluctant to do this, due to the risk that similar projects may already be underway within another department within the organization, unbeknownst to the manager who signs the confidentiality agreement.

## Chapter 5

In meetings between external innovators and Autoliv managers, it is typically only the external actor who shares information and there is hence little information-sharing undertaken on Autoliv's part. In such interactions, Autoliv clearly prioritizes protecting its own intellectual property over the benefits of mutually sharing information. Jan Olsson, Vice President of Research, explains that:

“Normally, it is a one-way communication. We don't open up and say: ‘Oh, what we do fits well with what you do.’ We don't do that. That would be something we would say only if we had an established relationship. We need to protect the company's intellectual property.”

If Autoliv managers decide that the idea or innovation is of interest to the company, the next step is choosing a structure for the exchange of information and determining the extent to which the inventor or entrepreneur will be involved in further development. In general, Autoliv has a preference for developing the idea without further involvement from the inventor or entrepreneur. Hugo Mellander, CEO of Traffic Safety Research and Engineering, also notes the reluctance of Autoliv to work with external actors when it comes to innovation, and suggests that this is the result of strong concerns about protecting the company's unique knowledge base, which might be disseminated if the firm were more apt to involve external parties in the innovation and product development processes. He states that:

“I think they are afraid of leaks. If I work with Autoliv, and even if I don't tell anyone about what we work on, I still learn a lot about their working methods and knowledge.”

### **Autoliv's role in attracting external ideas and inventions**

As shown in the pilot study, attraction processes can take different forms depending on the focal firm's use of active or passive attraction methods. Participating actively in the attraction process involves taking deliberate measures to attract external ideas and inventions, while passive attraction operates by dint of the firm conducting its own regular operations. The role that Autoliv assumes in the attraction process is clearly a passive one, as the attraction that the firm exerts is the byproduct of other factors, rather than a result of deliberate attempts to stimulate an inflow of externally developed ideas and inventions. With respect to the issue of actively soliciting external ideas and of broadcasting its technological needs beyond the reaches

*Attraction: A new driver of learning and innovation*

of the company in order to attract external actors that might propose solutions to these needs, Jan Olsson, Vice President of Research, states:

“No, we don’t do that. If we already have an established partnership with a university or a company that we know are good, it may happen that we initiate a thought process, but there is no general notice that we are trying to come up with inventions within a particular area.”

The only way that Autoliv can be said to attempt to stimulate an inflow of new impulses is by the way the company interacts with the external actors that do approach the firm. Jan Olsson stresses that although most of the impulses ultimately prove to be of little interest to the company, it is still important to ensure that entrepreneurs and inventors will return with other concepts in the future, so that the company will not miss out on interesting ideas that might later emerge.

“It’s about being interested enough that they will choose to return until you have found that one-in-a-hundred idea. The important thing is to listen and show that you have good reasons for not investing and most of them will accept this, even if they are a little disappointed.”

This quote illustrates how attraction can be a dynamic and recurring process whereby a recipient firm, in this case Autoliv, is repeatedly approached by the same actors who return with different ideas. Furthermore, the reception that these actors receive tends to influence the likelihood that they will return with new ideas. In other words, the attraction of external impulses is about encouraging external actors to come to you in first place, but also about ensuring that they return with new ideas and inventions in the future.

Two chief explanations have emerged from the findings to explain Autoliv’s minimal participation in attraction-enhancing activities. First, the study suggests that because of the relatively low value that Autoliv attributes to the inflow of externally developed ideas and inventions, the company is *not highly motivated* to stimulate this inflow and therefore exerts little effort to build attraction. Second, as a result of Autoliv’s status in the industry structure as a first-tier supplier that is called upon to channel new car safety ideas and innovations to automakers, there is also *little need* for Autoliv to en-

gage in attraction-enhancing activities, since the company can expect that external innovators will approach the company anyway.

In sum, the case description suggests that Autoliv takes a passive approach to attraction and that the inflow of external impulses is of limited importance to the company due to a number of characteristics of the industry, as well as certain properties of the types of products that Autoliv produces. In the following section, this broader picture of how attraction plays out for Autoliv and the industry at large is complemented by the results of the micro-level study of a specific example of an attraction process, which provide additional insights about the micro-level dynamics related to attraction.

### 5.2.3 Micro-level case study: The creation of the Anti-Whiplash Seat

As illustrated in the previous section, Autoliv rarely adopts and develops the impulses it attracts. However, one instance stands out as an example of a process whereby an external idea played a key role in the development of a new product. In this case, a device developed by Swedish inventor Bo Swedenklef played a significant role in the development of the so-called *Anti-Whiplash Seat*<sup>104</sup>. The process leading up to the development of this product is the focus of the following section.

#### Background

Neck injuries commonly result from rear-end car impacts. Although rarely life-threatening, these injuries can often have long-term consequences such as chronic pain, impeded mobility, and reduced working ability.<sup>105</sup> Usually termed whiplash injuries, these neck injuries had begun to attract increasing concern in the early 1990s. At that time, relatively little was known about the actual bio-mechanical mechanisms by which whiplash occurred during a crash and there were no car safety systems in place that could reduce the risk of incurring whiplash injuries in a rear-end collision. Both Autoliv and Volvo Cars had begun to devote internal resources to the investigation of this type of neck injury, stimulated by efforts within the academic com-

---

<sup>104</sup> The seat is often also referred to as the “WHIPS seat” (Lundell et al. 1998). One important note here is that Autoliv’s product is not the entire seat, but rather, the recliner mechanism that provides the whiplash protection. The seat itself is produced by a separate sub-supplier.

<sup>105</sup> Lundell et al. (1998).

munity, as well as among other actors such as the insurance company, Folksam, and the Swedish Road Administration.<sup>106</sup>

### **Swedenklef's development of an anti-whiplash seat<sup>107</sup>**

In parallel with the efforts helmed by industry leaders Volvo and Autoliv, Swedish inventor Bo Swedenklef had also begun to attempt to learn more about whiplash injuries, and in particular, how they could be prevented or alleviated. Swedenklef's interest in whiplash injuries had initially been triggered by a collision in which his partner had been involved. The car had been struck violently from the rear, but Swedenklef's partner somehow avoided incurring any whiplash injuries.<sup>108</sup> This improbable outcome incited Swedenklef's curiosity, and triggered him to increase the intensity of the invention activity to which he had long dedicated his leisure time. Specifically, Swedenklef began to investigate whether the insights from the collision could be used to develop a new type of safety product that could reduce the risk of whiplash injuries. The approach that Swedenklef used to investigate the issue diverged significantly from the methods employed by most other actors studying this problem, including Autoliv and Volvo. Inspired by the fact that his partner had avoided injury despite a violent impact, he decided to collect data only about cases in which cars had been hit from the rear and were severely damaged, but where passengers had not suffered any whiplash injuries.

In other words, he did not study any cases of actual whiplash injuries, which was the main focus of the other actors who were then studying the problem. In a sense, Swedenklef took a shortcut by not attempting to understand the nature of whiplash injuries and instead focused his efforts directly on the task of identifying the conditions under which passengers had avoided injury. Autoliv and Volvo, on the other hand, conducted a more comprehensive analysis, both beginning by trying to develop an understanding of the physiological mechanisms that cause whiplash injuries.<sup>109</sup>

Swedenklef's data collection method involved phoning many car repair shops in northern Sweden and asking them to contact him if

---

<sup>106</sup> Sandberg & Hervik (2004).

<sup>107</sup> This section builds on the accounts presented in newspaper articles, as well as a personal interview with Bo Swedenklef conducted in 2008.

<sup>108</sup> Wahlström (1995).

<sup>109</sup> Olsson (2008).

## Chapter 5

they were asked to repair a car with significant rear damage but with no reports of whiplash injuries being sustained by the driver or passengers. Using this method, Swedenklef was able to collect data about 20 such cases. He then contacted each person who had been involved in such an accident and had thus avoided injury. Swedenklef asked them about their perceptions and memories of the accident, what kind of car they had been driving, and several other similar questions. The first pattern that emerged from his study was that all of these people had been driving relatively inexpensive cars, all of which had soft and unstable seats with weak back rests.<sup>110</sup> This finding led Swedenklef to believe that the seat design should retain a degree of structural weakness so that it would collapse in a controlled manner during a collision and thereby absorb the energy that is transferred through the car by a rear-end impact.<sup>111</sup>

In order to test this hypothesis, Swedenklef built his own track for crash testing, which consisted of a 15-meter-long rail track where he could simulate collisions. He then carried out somewhere between 500 and 1,000 low-speed tests, using himself as a live crash-test dummy. In these tests, Swedenklef experimented with different solutions and judged them according to what felt more comfortable and caused the least pain. These experiments continued over the span of several years, and it took nearly five years of experimentation to find a solution that worked well.<sup>112</sup> As the next step in the development process, Swedenklef built a prototype of a seat based on his successful solution that drew on the concept of a two-stage movement in the car seat. In the fall of 1995, he applied for three patents to protect different variations of his invention.<sup>113</sup> He then started to investigate ways to commercialize his invention. However, having little interest in the commercial part of the innovation process, Swedenklef sought to find a large firm that could buy his invention and develop it into a

---

<sup>110</sup> Eriksson (1996).

<sup>111</sup> Wahlström (1995).

<sup>112</sup> The key to this solution was that it was based on a two-step movement in the seat. In the event of a rear-end collision, the seat simultaneously is turned into an upright position and moved backwards. Then, in the second stage, the back rest is reclined toward the rear of the car in a controlled fashion. The initial upwards movement of the backrest reduces the distance between the occupant's head and the backrest, while the rationale for moving the seat backwards is reducing the force with which the seat hits the person as a result of the energy that is transferred through the car in the moments after an impact (Wahlström 1995).

<sup>113</sup> Swedenklef (1995).

viable commercial product.<sup>114</sup> He first approached Volvo, which liked the idea but did not want to purchase it and pursue further development. Instead, Volvo representatives suggested that Swedenklef present the idea to Autoliv. Consequently, Swedenklef met with then-Vice President of Engineering, Sture Andersson, who instantly realized that this could be an important potential product for Autoliv and who, after a short discussion with CEO Gunnar Bark, agreed to buy an option on Swedenklef's pending patents.

#### **Autoliv acquires Swedenklef's patents<sup>115</sup>**

As discussed previously, Autoliv had already been conducting research on whiplash injuries for several years. Through collaborative efforts with several universities and major automakers, Autoliv had sought to establish risk criteria for whiplash in auto collisions, with the hopes of using this knowledge to develop products that could prevent the occurrence of this type of injury.<sup>116</sup> By 1995, Autoliv had intensified its research efforts within this area and had developed test methods and a crash-test dummy specifically for studying whiplash injuries. However, despite the progress that had been made, Autoliv continued to struggle to come up with a functioning technical solution. A concept seat had been developed in 1995, but it was not yet considered satisfactory.

The fact that Swedenklef's invention showed the promise of delivering such a technical solution triggered the interest of Sture Andersson, who, as mentioned previously, secured an option to later acquire Swedenklef's patents. In order to establish how Swedenklef's solution compared to the alternatives, Autoliv conducted an intense slate of tests in the fall of 1995, during which Swedenklef's prototype was compared to the internally developed seat and also several other existing car seats. After these tests were completed in January 1996, Autoliv decided to exercise its option to acquire Swedenklef's patents.<sup>117</sup> Swedenklef received a larger sum of money in exchange for the patents, and this concluded his contribution to the project.

---

<sup>114</sup> Ericsson (2006).

<sup>115</sup> The information in this section draws primarily on interviews with former Vice President of Engineering Sture Andersson and current Vice President of Research, Jan Olsson, as well as e-mail correspondence with Autoliv patent director Håkan Larsson.

<sup>116</sup> Swärd (1995).

<sup>117</sup> Wikström (1996).



**Autoliv and Volvo finalize the Anti-Whiplash Seat<sup>118</sup>**

In February of 1996, Autoliv and Volvo initiated a joint development project with the aim of integrating whiplash protection into the car seat of the new Volvo S80 model, which would go into production in 1998. After intense development and engineering efforts undertaken over the course of two years, a whiplash protection system based on Swedenklef's patented principles was completed and integrated as planned into the Volvo S80 model. The final design of the Anti-Whiplash Seat reflected Swedenklef's principle of a two-stage seat movement.<sup>119</sup> Figure 5.2 presents an illustration of the way that the finalized Anti-Whiplash Seat (or WHIPS seat) is designed and how the two-stage motion works by softening the impact of a rear-end impact for vehicle occupants. A detailed description of how the design works is given in the footnote below.

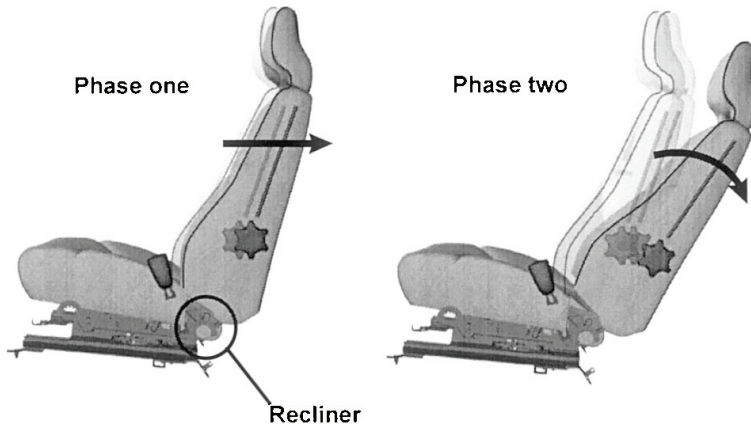
In the design of the Anti-Whiplash Seat, there were also certain differences from the physical prototype that Swedenklef had developed, which had been relatively rudimentary from an engineering perspective. Whereas the movement of the seat in Swedenklef's prototype was generated by a mechanism that was located on the side of the seat and hence was visible, in the final product, the motion was generated by a recliner that is integrated into the internal workings of the seat. Today, 10 years after the Volvo S80 first went into production with the first version of the Anti-Whiplash Seat, it remains the standard seat for all models produced by Volvo Cars, and Autoliv still supplies the seat's unique recliner mechanism.

---

<sup>118</sup> The information in this section draws primarily on interviews with the project manager of Volvo's and Autoliv's joint development project for the anti-whiplash seat, Björn Lundell, as well interviews with former Vice President of Engineering Sture Andersson and current Vice President of Research, Jan Olsson. Email correspondence with Autoliv Patent Director Håkan Larsson also supplied some information.

<sup>119</sup> "In a rear-end impact, the seat is accelerated forward with the car. Due to the inertia of the occupant, the back of the occupant is then pressed into the seat. When the forces from the occupant acting upon the seat backrest exceed a certain level, the WHIPS system is activated. The purpose of the first phase is: 1) to let the occupant sink into the seat, thereby reducing the distance between the head and the head restraint, 2) to create an initial rearward motion of the backrest, which does not move the head restraint away from the head, and 3) to keep occupant acceleration levels low, by letting the backrest move rearwards in a controlled way." (Lundell et al. 1998).

Figure 5.2 The Anti-Whiplash Seat (WHIPS) and the recliner



Source: Lundell et al. (1998).

#### 5.2.4 Summary and within-case analysis

The case findings reported in the previous section show that the attraction of external ideas and inventions plays a limited role in the Autoliv's innovation and product development, and that it is rare that external impulses that were attracted to Autoliv are in fact adopted by the company. However, as shown in the micro-level study, Swedenklef's invention played a key role in the development of the Anti-Whiplash Seat. A notable aspect of this is that it happened in an industry context where attraction is generally of low importance and despite the fact that Autoliv adopts few of the impulses that the firm attracts. As such, a question that arises is why this particular invention contributed to the development of a new product, even as most externally developed ideas and inventions get rejected. However, before addressing this question, the general findings of the study will first be reviewed and analyzed, specifically with respect to the reasons why the attraction of external ideas and inventions generally is of limited importance to Autoliv. These findings are also summarized in Table 5.2.

**Factors reducing the relevance of attraction for Autoliv**

Part of the explanation as to why Autoliv makes relatively little use of the inflow of ideas and inventions that it attracts seems to lie in the way innovation and new product development is organized in the auto industry, and specifically, in the ways in which Autoliv conducts R&D and generates innovation. As shown in previous sections, the development of a new product in Autoliv typically is not based on creative insights and ideas, but rather is the result of systematic analyses of accident databases and resource-intensive R&D processes that are conducted within the company. Undertaking research efforts of this magnitude requires crash test tracks, as well as access to the large accident databases. Because smaller actors typically do not have access to either of these resources, they often find it difficult to compete with the internal innovation mechanisms in place within Autoliv.

Furthermore, the nature of the industry in which Autoliv operates also makes it difficult for ideas for new products to be evaluated on a small scale. Developing a new safety system is a huge undertaking that requires substantial development and engineering efforts. As such, the number of new ideas that Autoliv can realize is relatively small, and the company has to be *highly selective* when it comes to investing in new ideas, which limits the use that Autoliv can make of the diverse inflow of external ideas and inventions that the company attracts. Because of the resource requirements and the complexity of initiating the development of a new safety system, the far-fetched ideas that Autoliv attracts tend to get weeded out at an early stage.

It is easy to imagine that in a different type of industry where new ideas can more easily and cost-effectively be tried out on a trial-and-error basis, attracted impulses are more likely to be evaluated and adopted, and further, that the attraction mechanism therefore may also play a more significant role.

Related to this argument, the case findings also indicate that the fact that Autoliv's products are integrated multi-component systems, and not stand-alone products, makes it more challenging for external innovators to make meaningful contributions, as they typically lack a detailed understanding of how Autoliv's existing safety systems work. The system-based nature of the products also renders it more difficult and costly for Autoliv to adopt external ideas and inventions, as these cannot be used at face value but need to undergo extensive

*Attraction: A new driver of learning and innovation*

adaptation in order to become compatible with the existing solution in the safety system.

**Table 5.2 Within-case analysis of Autoliv**

	<i>Findings</i>	<i>Quote</i>
Importance of attraction	Low	"In a way, you don't need this so much, because you have so many ideas internally, of which you can only realize a fraction anyway." (Sture Andersson, former Vice President of Engineering)
Effects of attraction	Source of variation that provides diverse ideas and inventions	"The ideas that come from the outside are more diverse. There are plenty of ideas that lie outside of what we normally do, but which still find their way to us." (Jan Olsson, Vice President of Research)
	Occasional adoption of externally developed technological solution (patent)	"You can say that one in a hundred is interesting, and then it's about finding that one." (Jan Olsson, Vice President of Research)
	Promotes learning about specific technological problems	"It is always useful to discuss new ideas. It stimulates your own thinking. I'm a firm believer in having plenty of communication if you want successful product development." (Sture Andersson, former Vice President of Engineering)
Factors influencing the importance of attraction	<p>Focused product portfolio</p> <p>Few and relatively homogenous customers</p> <p>Concentrated innovation and knowledge production in the industry</p> <p>Cost of trying out new product ideas</p> <p>System or stand-alone products</p>	
Approach to attraction	Passive	"No, we don't do that. If we already have an established partnership with a university or a company, it may happen that we initiate a thought process but there is no general notice that we are trying to come up with inventions within a particular area." (Jan Olsson, Vice President of Research)
Factors creating attraction	Relationships with carmakers	"If there is a small company that wants to establish itself in the industry, the best way is to enter through a supplier, because we have the contacts and the systems. It is hard for anyone who is not currently a supplier to get access to the car manufacturers." (Henrik Kaar, Director of Corporate Communication)
	Perceived receptiveness	"It's about being interested enough that they will choose to return until you have found that one-in-a-hundred idea." (Jan Olsson, Vice President of Research)

## Chapter 5

Another factor that works against the external actors who present their ideas to Autoliv and serves to diminish their potential role in Autoliv's innovation processes is *the structure of Autoliv's customer base and the structure of its product portfolio*. As demonstrated by the case description, the attraction mechanism is a source of variation, as the impulses that Autoliv attracts from the outside are more diverse than its own pool of internally generated ideas. However, because Autoliv's customers are few in number and are relatively homogenous as a group (in the sense that they are all car manufacturers and that even if they are willing to spend varying amounts of money on safety systems, they essentially all want the same type of systems) and because its product portfolio is so focused on a small number of products, *the company has relatively little need for high variation*. Because the customer base is not highly diverse, Autoliv can generate sufficient variation internally to satisfy its customers' needs. Likewise, because the company has a small number of different products, it can typically generate a level of variation internally that is sufficient to develop and renew its product portfolio. Again, there is reason to believe that the inflow of externally developed ideas and inventions would be of greater value to Autoliv if the company had a more diverse customer base, which likely would have created demand for a variety of different types of niche products that might have been difficult to create internally.

The extent to which external actors can contribute to Autoliv's innovation processes is also limited by Autoliv's close cooperation with its customers, the car companies; many of the firm's new ideas and innovations emerge as an outgrowth of these relationships. Because of the auto industry's multi-tier system, external innovators typically lack this direct link to the car companies, and as such, they are at a disadvantage with respect to their ability to discern and identify car companies' latent needs, as well as in their ability to identify opportunities for new safety systems.

Finally, a factor that further reduces the significance of the attraction of external ideas and inventions for Autoliv is the fact that innovation and new knowledge production in the automotive safety industry over time has become *highly concentrated* to a limited number of key actors, including the automotive safety specialists such as Autoliv, established car makers, and a number of academic institutions dedicated to traffic safety research. This pattern of concentration, along with the high degree of structure and institutionalization

### *Attraction: A new driver of learning and innovation*

that characterizes the multiple-tier supplier system in the auto industry, where each actor has a clearly defined role, has made the industry relatively easy to search. As a result, Autoliv now has a well-developed sense of where different types of competencies and capabilities reside among the other actors in the industry. This means that when the company has a need for external knowledge and capabilities, it is typically well positioned to determine which actor to contact. This is reflected in the following quote by Jan Olsson, Vice President of Research, who states with respect to the use of external innovation that:

“It may happen that we have a very specialized need. Then we scan what possibilities there are and turn to a company that we believe will have the right solutions.”

The relative ease with which Autoliv can scan the industry for the appropriate external innovation renders it less likely that the attraction mechanism will inform Autoliv about new innovations that it was either not aware of or could not have identified through its own search process, which in turn means that the spontaneous inflow of external ideas and inventions tends to be of less importance.

However, as follows from the case description and is shown in Table 5.2, this does not mean that the attraction mechanism is of no value to Autoliv. As can be seen from the micro-level case study of the origins of the Anti-Whiplash Seat, valuable ideas and technologies can emerge in unexpected places and external ideas can have an important impact on new product development for Autoliv, although it is a relatively rare occurrence. Further, the case findings also demonstrate that attraction represents a source of variation, as the inflow of external impulses is more diverse than the internally generated pool of ideas and inventions, which at times can have beneficial effects on Autoliv in terms of creating inspiration to explore new ideas, as well as by re-directing Autoliv’s search efforts into new areas, which explains why Autoliv still engages in meetings with impulse providers despite the low success rate associated with this process.

#### **An attractive target firm despite a passive approach to attraction**

Although some of the structural properties of the auto industry, such as the need for substantial research efforts and the relatively small number of customers, work against external actors who are trying to

## Chapter 5

present ideas to Autoliv and in fact serve to diminish the value Autoliv can derive from the inflow of external ideas and inventions, it is also interesting to note that these same structural properties make Autoliv *a highly attractive target firm* for anyone who has ideas that pertain to car safety. The multi-tier supplier system and the high degree of outsourcing utilized by the car companies both contribute to the creation of a “funneling effect” that leads many new ideas about car safety to Autoliv (or to similarly positioned competitors). Because automakers usually prefer to have first-tier suppliers such as Autoliv manage the development of new safety systems, they often redirect external impulses that they have attracted to their first-tier suppliers. This means that in this industry context, the established relationships that Autoliv has with the major automakers represent *unique and valuable resources* that exert substantial attraction on external innovators, who typically lack these resources.

Importantly, the fact that Autoliv possesses this unique resource that in itself makes the company a highly attractive target for innovators within the sphere of car safety also contributes to *diminishing* Autoliv’s incentives to engage in activities to build attraction and stimulate an inflow of external ideas and inventions. As a result, Autoliv is, as shown in Table 5.2, *passive* with respect to attraction, and the attraction that the company exerts is largely *a byproduct of its control over key resources and its status in the multi-tier supplier system that characterizes the industry*.

### **Potential benefits of a more active approach to attraction**

As shown by the previous sections, Autoliv’s passive approach to attraction is adequate in the sense that a significant share of the ideas and inventions that are related to the company’s core product areas and which emerge within the industry ultimately are brought to Autoliv’s attention. However, the analysis also suggests that the current passive approach means that Autoliv fails to make full use of the attraction mechanism and that a more active stance would enable the company to reap more benefits from it. In particular, the high level of secrecy surrounding Autoliv’s innovation processes means that impulse providers largely have to guess how their ideas and inventions might fit into Autoliv’s innovation processes, which means that most external innovators fail to understand how they can best contribute. This in turn seems to suggest that the quality and relevancy of the impulses that Autoliv attracts are of lower value than they otherwise

*Attraction: A new driver of learning and innovation*

would have been, had Autoliv revealed more information about its ongoing projects and its future intentions.

★ ★ ★

In sum, this analysis helps to explain why the attraction of external impulses is of limited importance to Autoliv, as well as outlining why the company takes a passive approach to attraction and refrains from engaging in any attraction-enhancing activities. As summarized in Table 5.2, the analysis details a number of factors that put external impulse providers at a disadvantage vis-à-vis Autoliv's internal innovation processes that are conducted in close cooperation with its customers, the car makers. These factors include the structure of Autoliv's customer base, where the relatively small number of customers typically allows Autoliv to anticipate the latent needs of its customers; the significant costs associated with trying out a new product idea; and the complex system focus of Autoliv's products, which makes it difficult for external actors to understand how their ideas and inventions could fit into Autoliv's safety systems. In addition, the analysis suggests that the concentrated and structured way that innovation occurs in the car safety sphere makes it relatively simple for Autoliv to seek out appropriate collaborators in those instances when it needs to search for external competencies, which in turn further serves to decrease the relevance of attraction.

The analysis further reveals that some of the same factors that limit the importance of attraction for Autoliv also make the company an attractive target for external actors with ideas related to car safety. This in turn ensures that Autoliv becomes exposed to many of the new ideas that emerge in the car safety sphere, despite the fact that the company refrains from engaging in any attraction-enhancing activities. Whereas this would seem to imply that Autoliv's passive approach to attraction is adequate, the analysis suggests that Autoliv would benefit from a more active approach to the attraction of externally developed ideas and inventions.

However, while attraction generally may be of peripheral importance for Autoliv, it is at times useful for the company, as was demonstrated by the micro-level case study. In the following section, I will discuss the conditions that were in place and contributed to a situation in which Swedenklef's invention was adopted and transformed



## Chapter 5

into a commercial product despite the many factors that tend to impede the adoption of external impulses in the company.

### Why was Swedenklef's invention adopted?

Given the numerous factors that work against the external innovators who approach Autoliv, it is worthwhile noting that Bo Swedenklef was able to sell his invention to the company, and to ask why this inventor's ideas positively impacted the development of a new product, whereas so many other ideas presented to the company are rejected. A sub-question related to this is how Swedenklef, with his extremely limited resources, came to hold the patents to the innovative solution upon which the Anti-Whiplash Seat was later built. Clearly, there was no lack of motivation on the parts of Autoliv and Volvo -- to the contrary, whiplash injury was a research priority for both companies at the time, and considerable resources had been dedicated to this area of investigation.

Instead, the explanation seems to lie in a combination of coincidences and differences in the practices that were employed. The key to Swedenklef's success seems to have been his approach of studying "success cases," i.e., rear-end impacts in which no whiplash injuries occurred. By way of an analogy, it can be argued that whereas Autoliv and Volvo went through *a comprehensive search process* starting from the beginning, Swedenklef employed *a heuristic* that skipped the step of trying to understand the injury per se. This heuristic proved to be less demanding of resources than Volvo's and Autoliv's approach, enabling Swedenklef to develop an innovative solution and become the first to patent the principles upon which the Anti-Whiplash Seat would later be developed.

A second question is why Swedenklef's invention was acquired by Autoliv and developed into a new product, when other evidence demonstrates how difficult it is for external actors to sell even high-quality inventions to one of the large companies in the automotive industry. Mats Lindquist at Saab Automobiles explains that:

"To get [your idea] to a large company, a lot of things need to fall into place. You have to meet the right person, in the right function, at the right time. With just a good product idea, you won't get very far."

This statement suggests that high quality and innovativeness are necessary but not sufficient conditions that need to be in place in order

*Attraction: A new driver of learning and innovation*

for an externally developed idea or invention to be adopted by Autoliv, since Autoliv only has the resources necessary to develop and commercialize a limited number of new products, meaning that there are many good ideas and solutions that never materialize.

In line with these arguments, the study suggests that the explanation for Swedenklef's improbable success is a combination of the unique quality of his invention (and his underlying patents) and a number of other factors. In Swedenklef's case, it is interesting to note that he approached Autoliv at a time when the company had intensified its efforts within the whiplash prevention area, but when it was still at a stage where it had not yet found a satisfactory technical solution. This suggests that timing was a key factor, in the sense that Autoliv had developed an interest in the whiplash sphere but had not yet made any definite decisions about a particular solution in which to invest. The accounts provided by Autoliv managers support the notion that timing was a key factor in the adoption of Swedenklef's solution. Sture Andersson, former Vice President of Engineering, notes that:

"In Swedenklef's case, it was that he came at just about the right time."

Jan Olsson, Vice President of Research, further observes that:

"We had not come very far when his ideas surfaced -- we had worked with [whiplash prevention] for maybe half a year and had not yet defined in detail what the system would look like."

This seems to suggest that there was *a window of opportunity* that Swedenklef was fortunate to stumble across. The findings seem to suggest that had Swedenklef arrived at an earlier stage, i.e., before Autoliv had started to increase its R&D efforts within the whiplash prevention area, the firm's interest in his solution would likely have been far less ardent, as the inventor's proposed solution would not have coincided with one of the firm's prioritized areas of research. On the other hand, had he arrived later, it is likely that Autoliv would already have set its development efforts on a different trajectory and Swedenklef's invention would no longer have been relevant. Jan Olsson extends this line of reasoning by emphasizing the almost serendipitous complementarity between Swedenklef's solution and the

## Chapter 5

internal knowledge that Autoliv had accumulated through its cooperation with universities and customers:

“It seemed very logical to buy this patent from the inventor because we were already active in the area and had built up some knowledge that matched his ideas very well. . . . We had then been working on trying to understand whiplash – what it is, what the bio-mechanics of neck injuries are -- and we had already come to the conclusion that we wanted just such a ‘strong-weak’ seat to absorb the energy. That knowledge coincided with the model [Swedenklef] suggested.”

This suggests that another key factor in the process, in addition to the serendipitous timing, was the fact that the ideas and solutions Swedenklef brought to Autoliv were sufficiently similar to Autoliv’s extant knowledge that the company could properly recognize the value of the invention and so that the two concepts could easily and fruitfully be combined, and yet sufficiently different from Autoliv’s own knowledge that the inventor’s ideas added significant value and made it worthwhile for Autoliv to acquire the underlying patents.

★ ★ ★

Finally, after having analyzed in the previous sections the overall role that the attraction mechanism plays for Autoliv, as well as the specific process through which Bo Swedenklef’s invention contributed to the development of the anti-whiplash seat, the case analysis of Autoliv is now concluded. In the following section, the study of Ericsson Multimedia will be presented.

### **5.3 Ericsson Multimedia and the “multimedia industry”**

In 2006, Swedish telecom equipment provider Ericsson announced the decision to create a new business unit called Ericsson Multimedia. This was presented as an effort to create growth in emerging product areas such as mobile services and IPTV (Internet Protocol Television). The creation of the new business unit, along with the communicated strategy of focusing on these new product areas, generated coverage in the business press and within the industry as a whole and triggered an inflow of externally developed product ideas and technologies, as well as propositions for other types of co-operations. Ericsson Multimedia manager Jörgen Odgaard notes that:

“We identify a number of needs and opportunities and then we actively go out and search for products, technologies, and partnerships in those areas, but in addition to that, we constantly get ‘courted’ by others. Especially in the position I’m in, people call all the time with ideas and suggestions for cooperation [...] There are different models for how we handle this – for instance, in the past, we have acquired companies and sometimes we distribute their products or develop shared go-to-market strategies.”

The study of Ericsson Multimedia shows that this inflow of external impulses plays a significant role in innovation and strategy development within Ericsson Multimedia and that the company, in addition to benefiting from spontaneous inflow, also conducts activities and sets up structures to stimulate this inflow.

#### **5.3.1 The context**

##### **The company and its products**

Ericsson is a world-leading telecommunication and data communication company. Its primary customers are mobile and fixed network operators around the world, to whom Ericsson delivers network equipment and related services.<sup>120</sup> In 2008, the company employed 78 740 people and had an annual turnover of 209 billion SEK.<sup>121</sup> Some of its chief competitors are Nokia Siemens Networks and Huawei.

---

<sup>120</sup> Together with Sony, Ericsson also owns mobile phone producer Sony Ericsson.

<sup>121</sup> Ericsson (2009).

## Chapter 5

Ericsson, which is headquartered in Stockholm, Sweden, was founded in 1876 and has a long history in the telecommunications industry. The company has survived and thrived during several major technology shifts in the industry. Ericsson has also served as a major instigator of several of these periods of technological development by engaging in extensive R&D efforts leading to the commercialization of innovative products and taking part in the important standardization work that often characterizes paradigm shifts within the telecommunication industry.<sup>122</sup> The launch of GSM mobile systems, along with the introduction of cellular phones, proved to be particularly significant, creating explosive growth throughout the 1990s, a period during which Ericsson was transformed into a *mobile telephony company* and was able to establish its leadership in the market for infrastructure equipment for mobile telephony (mobile networks), a status the company continues to maintain today.<sup>123</sup> At the current juncture, mobile networks constitute the majority of Ericsson's sales, and the company has managed to retain its world-leading position in this market, even as new generations of mobile networks, including so-called 3G networks, have been introduced to the market.

### Background to the creation of Ericsson Multimedia

During the period of exponential growth in the market for mobile networks that persisted throughout the 1990s and in much of the 2000s, Ericsson focused intensely on its mobile networks business. However, by the mid-2000s, a number of changes were beginning to emerge in the competitive landscape. First, the market for mobile networks started to show signs of slower growth and increasing maturity, which created an imperative for Ericsson to broaden its strategic focus and seek out opportunities for growth in other areas.

Second, the increasing bandwidth that is supported by 3G mobile networks meant that Ericsson's customers, the telecom operators, could now offer not only standard voice and messaging services (SMS) through their networks, but also a range of new mobile services and

---

<sup>122</sup> For a description of the standardization process in the telecommunication industry, see Glimstedt (2001).

<sup>123</sup> Notably, this process began gradually in the early 1980s with the inauguration of the Nordic mobile telephony system NMT, which Ericsson developed in cooperation with the Swedish telecommunication authority, Televerket (Regnér 1999).

### *Attraction: A new driver of learning and innovation*

applications, such as games, music services, social networking, and mobile TV. These emerging and increasingly popular features created a more complex situation for the operators, as they faced a market situation with a plethora of options based on new services that seemed to follow a different logic than traditional voice-related services.<sup>124</sup> The move towards a market dominated by a multitude of service offerings also shifted the basis of competitive advantage closer to the end users, which in turn created a need among the operators to understand more about the behaviors and the preferences of consumers. This trend ultimately proved to have profound implications for Ericsson, since the company had long aimed to deliver end-to-end solutions to operators and to support them in all aspects of their business.

Third, during the same period, increasing convergence between the three previously separate sectors of telecom, IT (web-based companies), and media (including the TV cable companies) was beginning to occur. From the perspective of Ericsson and Ericsson's chief customers, the (telecom) network operators, this meant that some existing markets were being challenged, even as other opportunities for new growth were opening up. Most notably, at the same time that the cable companies were starting to offer telephony and broadband to consumers in addition to their standard television offerings, telecom operators were stepping into the TV area through IPTV solutions.

In response to these developments, Ericsson presented a new strategy built on the concepts of "Excel," "Expand," and "Establish." Taken together, these concepts demonstrate that the company seeks to (i) excel within its core business, networks, through operational efficiency and sustained technological leadership in R&D, (ii) expand its market for managed services by leveraging the company's superior knowledge about networks and the needs of the operators, and (iii) establish presence in the market for new mobile services and the new competitive battlefield beginning to emerge as a result of the convergence between telecom, IT, and media.<sup>125</sup>

#### **The creation of Ericsson Multimedia**

In order better to achieve these goals, the company formed the new business unit Ericsson Multimedia in 2006. In conjunction with the

---

<sup>124</sup> For a more in-depth discussion of this development, see Torngren et al. (2007).

<sup>125</sup> Ericsson (2009).

## Chapter 5

founding of Ericsson Multimedia, the head of the new business unit, Jan Wäreby, stated that Ericsson Multimedia was intended to be the link between the networks and the cell phones produced by Sony Ericsson, a move that would give Ericsson so-called “end-to-end” control over the entire value chain.<sup>126</sup> Essentially, this means that a main objective of Ericsson Multimedia is to provide solutions that enable their customers, the network operators, to take advantage of increased bandwidth to deliver to end-users a broad range of new mobile services in addition to voice services. This includes providing *billing and revenue management solutions*, as well as *service delivery platforms* that enable operators to collect and integrate mobile services from different external service providers to the end-users.

In addition, Ericsson Multimedia seeks to provide solutions that assist the operators in the development of services and applications in areas where the boundaries between different devices, such as cell phones, computers, and TV sets, become blurred, and where today’s consumers expect to be able to seamlessly access the same content and services through an array of different devices. Specifically, Ericsson Multimedia has entered the market for delivering systems for IPTV, thereby supporting the attempts of the network operators to compete with the cable TV companies.<sup>127</sup> Since its inception in 2007, Ericsson Multimedia has enjoyed substantial growth. By 2008, the business unit had an annual turnover of 17,9 billion SEK.<sup>128</sup>

### The organization of R&D in Ericsson Multimedia

Ericsson Multimedia is an R&D-intensive organization, with approximately 2,200 researchers and development personnel assigned to a dedicated department called the Development Unit Multimedia Products that is headed by Gunnar Heldebro. Within this unit, a key dis-

---

<sup>126</sup> Privata Affärer (2006).

<sup>127</sup> In addition, Ericsson Multimedia not only targets its traditional customers, the network operators, but also content providers, such as media companies or Internet companies, that seek to distribute their services and content through the mobile networks. With respect to these areas, Ericsson Multimedia acts as a broker and a facilitator in the interaction between the content providers and the operators. Initially, the enterprise application business and Ericsson Mobile Platforms were also a part of Ericsson Multimedia, but these divisions have since been spun off.

<sup>128</sup> This growth has partly been organic and has partly been driven by a number of acquisitions, including those of IPTV company Tandberg, Mobeon, a supplier of IP-based voice and video mail, and Drutt, a provider of service delivery platforms (Ericsson 2009).

*Attraction: A new driver of learning and innovation*

inction exists between *development*, which refers to solutions that are expected to be delivered within 18 months, and *research*, which focuses on projects that have a much greater time horizon (typically three to five years). The vast majority of these 2,200 employees work within the development unit, which reflects the fact that R&D within Ericsson Multimedia is largely of an applied nature and further, that these activities are based primarily upon the identification and realization of new product ideas rather than on large science-based research projects. The Development Unit Multimedia Products is geographically dispersed across ten different sites around the globe, including Stockholm, Karlskrona, and Gothenburg in Sweden, Montreal in Canada, New Delhi in India, and Shanghai in China. Each site typically focuses on a certain product area; Stockholm, for instance, specializes in IPTV, whereas the Gothenburg facility specializes in service delivery platforms, while the Montreal group focuses on multimedia messaging services.

**New product ideas in Ericsson Multimedia**

Innovation is a complex and multifaceted process in Ericsson Multimedia, and the identification of new product ideas draws on a multitude of sources. Notably, this stands in contrast to Ericsson's traditional approach to innovation, wherein the process was based on significant R&D investment in a number of core products, close and long-term relationships with the company's chief customers, the (telcom) network operators, and industry standardization. Taken together, this traditional approach to innovation allowed the company to sustain its technological leadership and maintain an in-depth understanding of the needs of its customers, which could then be translated into improvement of the company's product portfolio. However, whereas internal R&D and customer collaboration are also important for Ericsson Multimedia, a number of characteristics of Ericsson Multimedia's business, along with changes in the competitive environment, have created an imperative to explore new approaches to innovation and the identification of new product ideas.

First, it is clear that network operators invest less in internal innovation and rely more on external actors to drive innovation and come up with ideas for new product and services, which means that Ericsson Multimedia cannot rely too heavily on operators to provide a sufficient pool of new product ideas from which to draw. Second, and as briefly mentioned previously, understanding consumer behavior is



## Chapter 5

a key success factor in Ericsson Multimedia's business, and this typically cannot be exclusively achieved through internal R&D and interaction with the operators. Third, Ericsson Multimedia's product portfolio is very diverse and the company cannot rely solely on a small number of core products, but rather must continuously add new services and applications to its product portfolio in order to remain competitive. Fourth, the competitive environment in which Ericsson Multimedia operates is highly complex and unpredictable, which requires the company to engage in extensive experimentation with different products, services, and business models, an approach that requires a high degree of variation of ideas and projects as the raw material for the necessary experimentation.

In response to these imperatives, Ericsson Multimedia engages in a number of activities directed towards innovation and the identification of new product ideas, which allows the company to "cast a wider net" and draw upon external sources of innovation. These activities include: (i) the research conducted at Ericsson Consumer Labs about consumer behavior around the world with respect to mobile communication and multimedia services, (ii) extensive monitoring of the start-up world through the creation of innovation contests through which start-ups are invited to present their business plans, (iii) other forms of external technology scouting (such as maintaining a personnel tasked with browsing the web for new and emerging technologies and engaging in networking events and communities related to mobile technologies), and (iv) internal innovation contests in which existing employees are invited to submit ideas for new products.

In sum, these activities are intended to give the company an understanding of changing consumer behaviors and to provide it with the requisite degree of variety in new product ideas that is necessary for successful innovation and product development in the context of Ericsson Multimedia's industry.

### **5.3.2 Ericsson Multimedia and the attraction of external ideas and inventions**

#### **Who approaches the company and what is their motivation?**

In addition to the innovation that Ericsson Multimedia produces through the different mechanisms described in the previous section, the company attracts a substantial inflow of external impulses. In response to this inflow, meetings between Ericsson Multimedia man-

*Attraction: A new driver of learning and innovation*

agers and impulse providers who seek to interest the managers in their ideas, technologies, and products are continuously taking place within the company. The majority of the impulses that Ericsson Multimedia attracts come from smaller entrepreneurial companies. These impulses are often consumer-related, as the impulse provider typically has developed a new type of mobile application, such as, for instance, a new video service or a new navigation service.

The most frequently cited motive for approaching Ericsson Multimedia can be found in the structure of the industry itself. Network operators control the relationship to the end-users, and as such, it is typically necessary for an aspiring firm that develops end-user applications to go through the operators to reach the end-users. Selling directly to network operators is, however, generally difficult for small firms, as the operators often prefer to buy from established suppliers with a proven track record, such as Ericsson. Hence, a common motive for external firms to approach Ericsson Multimedia is that Ericsson has a large network of established relationships with telecom operators around the world from which the external actors seek to benefit as they move toward the commercialization of their products. Christina Sundman, CEO of Challenger Mobile, explains that:

“We look for a larger partner like Ericsson Multimedia so that we become a more credible partner vis-à-vis the telecom operators. You need a partner that is already well known and that already delivers to the operators and has the established relationships.”

Torbjörn Nilsson, former Senior Vice President of Strategy at Ericsson, reinforces this point and argues that:

“It is incredibly difficult to get any leverage if you don’t have the established channels that are needed to get out onto the world market – and it takes many years to build those. The only way in is to develop something good that fits with the strategies and products of one of the larger companies, such as Ericsson, and thereby to get a number of reference orders.”

A common aspiration of the impulse providers is to become a part of Ericsson Multimedia’s product portfolio and thus to have their applications included when Ericsson signs a larger deal with a network operator, which is reflected in a quote from Mia Sandell, Director of Mobility for Qbrick:

## Chapter 5

“What you want is to get into Ericsson’s product portfolio and thus to be included when Ericsson sells a larger platform.”

### **Types of impulses**

As suggested previously, most of the impulses that Ericsson Multimedia attracts are consumer-oriented and consist of a new type of a mobile application such as a new video service, a new navigation service, or a service related to user-generated content. Another significant pool of impulses consists of new applications for IPTV. Overall, most impulses are relatively limited in scope, in the sense that they focus on one application that is designed to appeal to a particular niche market. Torbjörn Nilsson, former Senior Vice President of Strategy at Ericsson, explains that:

“The [external providers] usually try to find a niche within the system or they build applications that they can add to the system.”

In terms of the readiness of the external impulses presented to Ericsson, they range from mere ideas to fully functioning applications that already include the software necessary for delivery to end-users. From a commercial perspective, the impulses also differ significantly, ranging from actors who only have preliminary ideas about commercialization to those who can present a clear business opportunity with a specific customer in mind, but who require the backing of Ericsson to be able to close the deal. Because of the localized nature of the multimedia business and significant local variations in terms of user behaviors, user preferences, and language, the impulses often emerge in a local market and are also often targeted at that specific geographical or cultural market. As such, the interaction between impulse providers and Ericsson Multimedia takes place in all Ericsson Multimedia units around the world.

### **How is Ericsson Multimedia affected by the inflow of ideas and inventions?**

Based on the previous section, which shows that Ericsson Multimedia attracts a large number of external impulses, the next question that will be addressed pertains to how the company is affected by this inflow. A significant finding with respect to this question is that the effects are multifaceted, and that whereas Ericsson Multimedia benefits directly from the inflow by adopting a number of the ideas and inventions with which it is presented, the company also benefits indi-

### *Attraction: A new driver of learning and innovation*

rectly from the pool of external impulses that are not adopted and turned into commercial products. In the following section, these effects are further detailed and investigated.

#### **Direct effects: Filling the application portfolio and building the market**

Two core product areas within Ericsson Multimedia are systems for IPTV and service delivery platforms for mobile services. Both of these product areas require dual capabilities, in that they require both the ability to integrate complex systems, as well as the ability to create new and innovative services and applications that differentiate IPTV systems from existing cable TV systems and new service delivery platforms from existing mobile systems that only support voice and messaging (SMS). In other words, Ericsson Multimedia needs to be able both to develop complex systems and to offer new and innovative services that will motivate customers to invest in these new systems.

As a result of its history of innovation and the technological competence that the company has accumulated over time, Ericsson Multimedia has attained expertise in developing and delivering complex systems. However, when it comes to the creation of innovative ways of using this technology, i.e., the development of new applications, which requires an in-depth understanding of consumer behavior, the company is not as dominant, partly because of its history as a firm mainly engaged in business-to-business transactions. Dan Fahrman, Senior Advisor at Ericsson Multimedia, explains that:

“We are very skilled at driving development projects. We don’t need to bring that [competency] in – we already know that. Ericsson is great at managing big projects and developing products that work – that is not the problem. The problem is identifying the fresh new ideas.”

In contrast, the smaller entrepreneurial companies in the industry often lack the capabilities to build complex systems, but are, on the other hand, highly in tune with the behaviors and preferences of the end-users. As such, it is often external innovators and smaller companies that are the most innovative when it comes to the development of new applications and services, a point emphasized by Niklas Sjöberg, CEO of Mozoomi, who explains that:

“Most of the idea generation takes place at the entrepreneurial level, especially when it comes to the end-users, end-user behavior, and all types of

## Chapter 5

services or applications that are related to this, such as how to navigate or how to organize your digital photo albums.”

The case findings show that many of these entrepreneurial companies, for the reasons discussed in the previous section, approach Ericsson Multimedia and present their ideas to the company. The study further shows that these externally envisioned applications play a role in developing Ericsson Multimedia’s portfolio of services and applications. Jörge n Lantto, Research Director at Ericsson Multimedia, stresses that:

“For Ericsson Multimedia, it is almost always the case that third-party products are included in the complete solution that we deliver to our customers (typically operators).”

In effect, the study demonstrates that the inflow of external impulses informs Ericsson Multimedia about how their technologies and systems can be used to benefit the end-users, and thereby to create value for Ericsson Multimedia’s customers, the network operators. This process influences Ericsson Multimedia in two ways. First, by adopting externally developed applications and integrating them into its product portfolio, Ericsson Multimedia earns additional revenues, either as the result of revenue-sharing arrangements with the developer of the application or as the result of having purchased the rights to the application.<sup>129</sup> Second, and more importantly, having access to a large portfolio of applications provides Ericsson Multimedia with an important selling point when it offers its mobile systems or IPTV systems to the network operators, since these applications also provide an additional revenue stream for the operators. In effect, offering a broad application portfolio provides a rationale for the network operators to invest in the new types of systems that Ericsson Multimedia develops. This means that the inflow of externally developed applications helps Ericsson Multimedia build the market for its core products, such as IPTV systems and service delivery platforms.

### **Indirect effects of impulses not adopted: Learning and early warning signals**

As described previously, the study reveals that external impulses that are not adopted by Ericsson Multimedia can also often be of value to

---

<sup>129</sup> Notably, this is a relatively small source of revenue in relation to Ericsson Multimedia’s total sales.

*Attraction: A new driver of learning and innovation*

the company. In this section, this finding is further explored. It has been established that Ericsson Multimedia is active in an environment that is turbulent, complex, and unpredictable, conditions that are reflected in the current uncertainty about the emerging convergence between telecom, IT and media with respect to (i) which actors will dominate this common playing field in the future, (ii) the types of product offerings that will prevail, and (iii) which technologies will dominate in the future. Consequently, innovation and strategic decision-making must transpire under conditions of significant uncertainty, which means that the ability to acquire relevant information and to accurately interpret and make sense of this information are crucial skills for. Torbjörn Nilsson, former Senior Vice President Strategy at Ericsson at Ericsson, emphasizes that:

“The great future technologies and the related innovations are already out there now, but it’s just a matter of understanding what they are. It’s about seeing patterns and understanding how the different puzzle pieces will start to fall into place and how the consumers, the end-users, will develop.”

The study suggests that the inflow of external impulses plays a significant role in determining how Ericsson Multimedia puts this complex puzzle together. Attracting an inflow of diverse impulses and listening to and interacting with a diverse group of impulse providers enables the company to get an overview of the competitive landscape, both in terms of the technological development in different sub-segments of the market and with respect to the behaviors and preferences of end-users in various market niches. In other words, this implies that interaction with the impulse providers helps Ericsson Multimedia to learn about key trends in terms of technological advancement and market developments. Jørgen Odgaard, former Director of Ericsson Developer Connection, underscores the importance of interacting with a diverse group of external actors:

“It’s the lifeblood of the company to maintain a connection with other small, medium-sized, and large companies and to have lots of discussions with them in order to help the company continue to develop.”

Significantly, in terms of learning about the complex competitive environment, these benefits tend to materialize even if the company does not adopt any of the presented impulses, because crucial infor-

## Chapter 5

mation is typically communicated as the impulse providers present their ideas to the company and in the ensuing internal and external discussions about the idea. This also points to the important role played by meetings that transpire between impulse providers and internal managers. A longtime telecom entrepreneur and CEO of a mobile services company (name withheld) argues that:

“It is definitely an implicit strategy among the large companies to agree to meetings with smaller companies in order to listen to what they have to say. The small companies know the market niches and move very fast. It is therefore not difficult to get large companies such as Ericsson Multimedia or Sony Ericsson to agree to a meeting, even with the top managers. They ask and they listen – they ask detailed questions. Many entrepreneurs are flattered that they get to meet these top managers and are happy to provide as much information as possible about their proposed solutions.”

However, it is important to point out that this process does not involve plagiarism of entrepreneurs’ ideas. The entrepreneur further emphasizes that:

“I have never seen a case where you have presented something to a large company and then it has shown up two years later being produced by that company. It’s more about the large company taking advantage of the entrepreneur’s time and by doing so, developing a better understanding of where the market is going.”

The case findings further suggest that this learning mechanism is particularly relevant when the company is entering a new market, such as when Ericsson Multimedia decided to move into the IPTV space in 2007. At that time, Ericsson lacked in-depth knowledge about the market and did not possess the technological leadership that characterizes Ericsson’s position in many of its established markets. Henrik Ericsson, Strategic Product Manager for IPTV Services, describes the role of external impulses during the period when Ericsson Multimedia initially entered the IPTV market in 2007:

“When we announced that we were moving into IPTV, a lot of companies approached us with ideas, and by suggesting things they could do together with us, and since we were kind of beginners in this area, we learned a great deal about the market and its potential.”

### **Early warning signals**

Another related aspect of attracting a large number of external impulses is that it makes Ericsson Multimedia less likely to be surprised by emerging competitors or new disruptive technologies. By evaluating many external impulses and engaging in a large number of meetings with impulse providers as they present their ideas and technologies, Ericsson Multimedia is likely to get early warning signals about emerging technologies or new types of products and services. With respect to the risk of being caught off-guard, Torbjörn Nilsson, former Senior Vice President Strategy at Ericsson, explains that:

“Typically, we don’t have to worry, because these companies usually come to Ericsson pretty quickly, wanting to promote themselves in different ways, so there is little risk that we will miss them. It’s pretty rare that a company appears all of a sudden that we haven’t heard of. They usually take for granted that [Ericsson] can be a supplier or a customer. . . . [The inflow of external impulses] functions as a kind of a control mechanism so that we don’t miss anything significant.”

### **The interaction and evaluation process**

The case study suggests that the interaction and evaluation process that follows the attraction of an external impulse poses a number of problems that have historically served to impede Ericsson’s adoption of external ideas and inventions. A key challenge to the successful adoption of an external idea or application is the difficulty for external impulse providers of finding the right person within Ericsson. The case study shows that it is crucial that an external impulse encounters the right person in the right function in order to succeed, because decisions about adopting external ideas are made under conditions of uncertainty and often involve new and untried opportunities. As such, different people within the company, depending on prior knowledge, may come to different conclusions about the potential of an external idea and therefore may make different adoption decisions. Bernt-Eije Peterson, Process and Discipline Manager of the Ericsson Multimedia Development Unit, explains that:

“The problem is that Ericsson is so large, so diversified. It is divided into different product areas, and even if you have a contact in Ericsson, if the idea does not fit that product area, the idea will die. If there is no connection to the product area where it would fit in, it will just disappear.”



## Chapter 5

Karl Bohman, CEO of Mondozer, reinforces this view and adds that:

“It’s really hard to find the right people within the large companies in the industry.”

However, in response to these difficulties, deliberate efforts have been made with the objective of addressing these challenges since the founding of the Ericsson Multimedia unit. Most notably, within Ericsson Multimedia, a unit called Ericsson Developer Connection<sup>130</sup> has been created that is dedicated to the evaluation and adoption of external impulses related to new mobile applications. Jörgen Odgaard, former Director of Ericsson Developer Connection, explains the role of the new unit:

“We are like a door into Ericsson. If you want to work with Ericsson technology or if you want to engage in a partnership with us, then there is a section on the global Ericsson website where developers are welcomed, and where you can find technology, documentation, and articles to aid you. There, you’ll also find a list of contacts to help you find us around the world.”

Ericsson Developer Connection provides both a structure for systematically evaluating external impulses and an internal network within Ericsson Multimedia with nodes around the world that is intended to improve the chances of directing external impulses to the right place within Ericsson Multimedia (or if applicable, to one of Ericsson’s two other business units). Significantly, Ericsson Developer Connection is intended to provide a channel into Ericsson for those impulse providers who lack a personal contact within the company and to offer equal opportunities to actors all around the world. The creation of a dedicated unit is also intended to ensure that external impulses are evaluated systematically and to decrease the element of chance and coincidence when it comes to the processes through which impulses are evaluated, i.e., to ensure that external impulses are not rejected just because they were presented to the wrong person.

This study suggests that the creation of Ericsson Developer Connection has alleviated, to some extent, the problems associated with

---

<sup>130</sup> The unit was initially known as Ericsson Mobility World and assumed its current name in 2008.

### *Attraction: A new driver of learning and innovation*

the evaluation and potential adoption of external impulses, but that some of these problems still persist within the company.

#### **Ericsson Multimedia's role in attracting external ideas and inventions**

In addition to the spontaneous inflow of external ideas and inventions that it attracts, Ericsson Multimedia also tries systematically to stimulate an inflow of external impulses. First, the study shows that Ericsson Multimedia explicitly solicits ideas for new mobile applications, a strategy that is reflected in the following quote from the global Ericsson website:

“You can go to market together with us by becoming a business partner. Ericsson actively searches for, recruits and manages companies that provide applications that add value to our end-to-end solutions and drive traffic and revenue in operators' networks. If you have great ideas about applications or if you have developed new applications enabling IMS or SDP, please contact our application portfolio manager directly by filling in this web form or contact your nearest Expert center.”

Second, through the Ericsson Developers Connection, the company promotes the external development of new mobile applications by providing access to both documentation and development tools based on Ericsson technology and software. Jörgen Odgaard, former Director of Ericsson Developer Connection, explains that:

“Through Ericsson Developer Connection, we share our software with external developers. We want external companies to do something with it and then come back to Ericsson so that we can bring these new applications to our customers. In terms of innovation, this is one of the areas where Ericsson really tries to attract innovation to the company and its technology.”

The case findings suggest that Ericsson Multimedia employs the principles of *openness* and *reciprocity* in its efforts to build attraction and to stimulate an inflow of external impulses. Significantly, by sharing some of its future plans and aspects of its technology and software, the company hopes to be rewarded by the community of external developers through an inflow of impulses. Jörgen Odgaard further stresses the importance of sharing interesting new information and knowledge in order to remain attractive:

## Chapter 5

"You have to know how to make yourself attractive in these communities. It must never look like nothing is happening and the company is stagnating. This is very important – you must feed the community all the time."

These findings imply that building attraction is a continuous process in which a constant exchange takes place between Ericsson Multimedia and the external community, and where it is necessary to continuously provide new information and innovation to the external community in order to retain the ability to attract the best ideas and applications. Significantly, however, it is also recognized within Ericsson Multimedia that revealing too much information, or trying to exert too much control over the inflow of external impulses, can be detrimental to the innovative capacity of the impulse providers. J rgeen Odgaard argues that being overly specific about what the company wants the external innovators to do might actually stifle external innovation and limit the inflow of external impulses:

"You mustn't pave the way too much. If you have a race track and you tell everyone to go round it, then everyone will go round it forever and not much more will happen. If you want progress, then you must say that this is the playing ground, but leave certain things open. That is my latest conclusion: you want to be attractive enough, but back off a little when it comes to control. I think it's a mix of being clear about what we do, but more vague about what we want others to do. If you control that very tightly, you will get what you expected but not so much more. If you want more, you'll have to define the boundaries a little differently."

In sum, the case study shows that Ericsson Multimedia engages in a number of activities and devotes significant effort to building attraction and stimulating the inflow external impulses. In the following sections, this conclusion will be discussed further, in terms of analyzing why Ericsson Multimedia is inclined to engage in these attraction-enhancing activities. First, however, the findings of the micro-level case study of a specific attraction process will be reported.

### 5.3.3 Micro-level case study: The creation of new IPTV services

As can be inferred from the previous sections, the external impulses that Ericsson Multimedia attracts influence the company in a number of ways. As was further shown by the case description, the inflow of external impulses is of particular importance in the product areas Ericsson Multimedia has recently entered and in which the company

### *Attraction: A new driver of learning and innovation*

remains in a learning stage. One such area that Ericsson Multimedia has recently entered is IPTV, and in this section, it is outlined how an external impulse contributed to developing the company's product offerings in this segment. The following section describes the process whereby Ericsson Multimedia was approached by entrepreneurial firm Accedo, and how the company chose to integrate a number of Accedo's applications in its IPTV offerings.

#### **Background**

Increased transmission speeds in broadband networks have opened up the possibility of delivering high-quality TV through broadband networks. This method for television delivery is generally referred to as *IPTV*, which stands for Internet Protocol Television and refers to the delivery of digital television and other audio and video services over broadband data networks using the same basic protocol that supports the Internet.<sup>131</sup> IPTV offers an alternative to the established channels for distributing TV content, such as cable TV and broadcasting TV signals through the ether. IPTV first began to attract attention in the early 2000s and a few years later, the first offerings emerged on the market, and by 2008, approximately 22 million users had subscribed to IPTV.<sup>132</sup>

For the large telecom operators that own and control the broadband networks, offering TV services to customers through broadband networks has emerged as a potential driver of growth that could compensate for the stagnating growth in mobile telephony and broadband access, both of which have been tremendous growth engines over the last several decades. A preferred mode among many of the operators has been to include IPTV in a package called "Triple Play," in which IPTV is bundled with fixed telephony and broadband access.

As explained previously, Ericsson's primary customers have always been the telecom operators, and as such, Ericsson's prospects for growth have long been largely a function of the growth experienced by the telecom operators, which means that stagnating growth for the operators tends to translate into limited growth opportunities for Ericsson. However, at the time that the telecom operators first began to invest in IPTV, it was not obvious that Ericsson would follow their customers into this new business. Although Ericsson had

---

<sup>131</sup> Cooper & Lovelace (2006).

<sup>132</sup> Ericsson internal estimation.

## Chapter 5

existing relationships with the telecom operators and a core competency in developing communication networks, the company did not have any experience in the TV industry, as its strength lay in the mobile network business. Furthermore, in the early part of the 2000s, Ericsson did not have a particularly strong position in broadband networks, which are the media used for delivering IPTV. The operators' move into IPTV hence constituted both a challenge and an opportunity for Ericsson. Ultimately, Ericsson decided to enter the market for IPTV solutions and to include the new product area in its Multimedia business unit, a move that was announced in 2007. This announcement was followed by a large R&D investment aimed at developing the company's own solutions and competencies within the IPTV area, as well as by a number of acquisitions of companies such as Redback and Entrysphere that were aimed at strengthening Ericsson's general market position in broadband networks. Ericsson also acquired a number of companies whose competencies were specifically related to IPTV solutions, including Tandberg, which was a leading company in the part of the IPTV value chain known as video encoding.

### **The development of new types of applications for IPTV<sup>133</sup>**

Prior to Ericsson's decision to enter the IPTV market, Swedish entrepreneurs Fredrik Andersson and Michael Lantz formed a company called Accedo Broadband. The background to the formation of venture was that both principals had experience as consultants working with some of the large Swedish telecom operators, including TeliaSonera and Tele2. During this period, both had noticed that increasing numbers of telecom operators were moving into the IPTV market. While conducting market studies for these companies, Andersson and Lantz noted that the operators were struggling to differentiate their product offerings from those of the existing cable TV companies. Although offering the standard TV schedule via the IP platform seemed to be working well in countries where there was no existing cable TV infrastructure, Andersson and Lantz recognized that it was difficult for telecom operators to compete in countries where there was already a cable TV infrastructure in place, without having specific sources of differentiation to apart from the existing offerings.

---

<sup>133</sup> The information in this section draws primarily on interviews with Fredrik Andersson, Accedo, and Ericsson Multimedia manager, Mårten Wesslén.

*Attraction: A new driver of learning and innovation*

Based on this observation, the two concluded that there would be a niche in the market for companies that could help the operators develop features and benefits that would differentiate IPTV offerings from the cable TV-based offerings. In order to fill this niche, they founded Accedo Broadband and based the company's strategy on the premise that user interactivity is one of the unique attributes of IPTV. More specifically, the founders of Accedo focused on developing entertainment-related services adapted to IPTV, including gaming, quizzes, and karaoke.

At this stage, Accedo began to promote its product offerings directly to telecom operators in Europe. While the company achieved modest success, it rapidly became apparent to the founders that it is difficult for a small and largely unknown company to sell directly to the large operators within the industry. Notably, in Accedo's first years, Ericsson had not yet launched its IPTV initiative. However, by 2006, rumors were starting to circulate that Ericsson was considering entering the IPTV field. Fredrik Andersson, VP Business Development of Accedo, explains that:

"I think it was in 2006 that you started hearing some rumors about Ericsson and IPTV, a little noise, but you didn't see them at the trade shows and it was unclear what they were going to do, and nothing had yet been officially launched. Via another company, Tilgin, I was able to get in touch with Henrik Ericsson at Ericsson. I called him and made a short pitch over the phone and told him that we should meet because we could help them with developing their IPTV product offerings and figuring out how to differentiate them."

Henrik Ericsson, who at the time was in charge of Ericsson Multimedia's IPTV launch, expressed an interest in Accedo's products. Over the course of the next year, the two parties continued to engage in further discussions, which ultimately resulted in a marketing cooperation agreement. Essentially, this arrangement meant that Ericsson would include Accedo's products in its product portfolio and promote them to its customers as part of Ericsson's IPTV offerings. This arrangement provided Accedo an outlet for its products and gave Ericsson an opportunity to differentiate its IPTV offerings from existing solutions based on cable TV.

## Chapter 5

### Merging TV and the web

In the years since the initial arrangement was devised, the cooperative agreement between Ericsson and Accedo has developed and taken on new forms. Accedo has worked continuously with the ambition of merging TV and web-based services, operating under the assumption that viewers will appreciate the opportunity to use web services via their television set and remote control. After having initiated the partnership, Accedo also presented this idea to Ericsson, and in 2008, Ericsson and Accedo agreed to pursue this project and adapt a number of popular web services, such as YouTube, IMDB.com (The Internet Movie Database), and Picasa to the IPTV environment. Mårten Wesslén, Strategic Product Manager for TV Content at Ericsson Multimedia, argues that while this project has not yet resulted in commercial products, it has significant potential for becoming an essential part of the company's IPTV offerings. He contends that:

“This is a breakthrough, to connect traditional TV and the web.”

Significantly, he suggests that if this project proves to be successful, it will generate a unique benefit and point of differentiation that will be difficult for traditional cable TV companies to emulate.

★ ★ ★

In sum, this case study illustrates how the cooperation with Accedo, along with other similar partnerships with firms that have developed new services related to IPTV, has played a significant role in Ericsson's development of a strategy in the IPTV market. In effect, Ericsson Multimedia's IPTV strategy is built on two pillars: first, to leverage its existing competencies in integrating complex systems by ensuring that the company can offer its customers “a one-stop shop” by delivering complete systems that do not require the customers to conduct any additional integration; and second, to offer a wide variety of additional services over and above the standard offerings supplied by cable TV companies. Significantly, as discussed in previous sections, the creation of these additional services requires a different set of capabilities compared to Ericsson Multimedia's core competency in systems integration; most notably, it requires an in-depth understanding of consumer behaviors, which is not the company's strong suit. As such, attracting an inflow of externally developed services

created by companies that specialize in certain segments of the market fills a gap in the company's own capabilities and complements Ericsson Multimedia's existing capabilities in an important way.

### **5.3.4 Summary and within-case analysis**

As revealed by the case description, the attraction of external impulses offers significant benefits to Ericsson Multimedia, as the company benefits not only from the external impulses that are adopted and commercialized, but also from the pool of impulses that ultimately are rejected. It further shows that Ericsson Multimedia takes a proactive approach to the attraction. In the following sub-sections, these findings are analyzed with a specific focus on the ways in which the company benefits from attraction. The following analysis will also explain why attraction is valuable for Ericsson Multimedia and why the company chooses to engage in a number of attraction-enhancing activities. The findings are also summarized in Table 5.3.

#### **Attraction and complementary competencies**

The case analysis suggests that the main reason why Ericsson Multimedia can benefit from attracting external impulses is that entrepreneurial firms in the environment around the company possess certain competencies that Ericsson Multimedia tends to lack as a consequence of its historical heritage. The external innovators are typically specialized in narrow niches of the market, and have an in-depth understanding of the behavior and preferences of a specific consumer group, or of a specific technology. They are therefore well-positioned to identify opportunities to develop new products and services. Ericsson, on the other hand, has a history as *a business-to-business company*, which has allowed it to develop *a core competency in assembling complex systems for network operators*, but at the same time, has left it lacking certain capabilities with respect to *discerning and understanding consumer behavior*.

As a result, the company is not perfectly suited to identify new, creative ways in which the technology in its systems can be best put to use. Consequently, Ericsson Multimedia benefits substantially from external actors who identify new ways of utilizing the company's systems, e.g., through the development of new mobile applications or applications related to IPTV that can be included in Ericsson Multimedia's application portfolio.



## Chapter 5

The study further reveals that Ericsson Multimedia actively searches its environment for externally developed ideas and innovations in order to benefit from the innovative capacity that is dispersed in the external environment, especially among smaller entrepreneurial firms. Searching for these external innovators is however challenging as these are often startups and small companies with minimal visibility. In addition, because of *the high level of dynamism in the environment*, new actors of this type are constantly emerging and exiting the industry, which makes it difficult for the company to remain abreast of external innovations that are being produced. In contrast, Ericsson Multimedia is highly visible and well known to developers of new mobile applications, which makes the company easy for them to find. As a result of this *asymmetry in visibility*, in many instances it is the external actor that identifies the connection between itself and Ericsson Multimedia, and subsequently initiates the contact. As a result, a significant proportion of the new, externally developed applications that Ericsson Multimedia has included in its product portfolio resulted from attraction processes wherein external actors approached Ericsson Multimedia to present their ideas.

### The effects of attraction

As indicated in the case description, Ericsson Multimedia can benefit from attracting an inflow of external impulses in several different ways, which are outlined in Table 5.3. First, as previously mentioned, it allows Ericsson Multimedia to add new applications to its portfolio, which creates *additional revenues for the company*, but even more importantly, *contributes to building the market for the company's main products*, service delivery platforms and IPTV systems, as it provides the rationale for network operators to make investments in these new types of systems, because adding new types of applications also means new revenue streams for the operators. Second, in addition to these direct effects, which are dependent on whether impulses are indeed adopted by Ericsson Multimedia, there are also *indirect effects*, which notably, are *not* contingent upon whether the impulses are actually adopted. Significantly, the inflow of external impulses constitutes an important source of information for Ericsson Multimedia, exposing the company to a wide variety of ideas and perspectives.

## *Attraction: A new driver of learning and innovation*

**Table 5.3 Within-case analysis of Ericsson Multimedia**

	<i>Findings</i>	<i>Quote</i>
Importance of attraction	Relatively high (but dependent on the product area)	<p>“When we announced that we were moving into IPTV, a lot of companies approached us with ideas, suggesting things they could do together with us, and since we were kind of beginners in this area, we learned a great deal about the market.” (Henrik Ericsson, Strategic Product Manager for IPTV Services and Applications)</p> <p>“We are very skilled at driving development projects. We don’t need to bring that [competency] in – we already know that.” (Dan Fahrman, Senior advisor, Ericsson Multimedia)</p>
Effects of attraction	Infuses creativity into innovation processes and stimulates broad exploration of new ideas	“Most of the idea generation takes place at the entrepreneurial level, especially when it comes to the end users, end-user behavior, and all types of services or applications that are related to this.” (Niklas Sjöberg, CEO Mozoomi)
	Expands the product portfolio	“For Ericsson Multimedia, it is almost always so that third-party products are included in the complete solution that we deliver to our customers.” (Jörgen Lantto, Research Director at Ericsson Multimedia)
	Drives learning about the competitive environment	“Because so many entrepreneurs come and pitch ideas, the companies get the opportunity to put together all the small puzzle pieces and see the bigger picture and how it all fits together.” (Niklas Sjöberg, CEO Mozoomi)
	Provides early warning signals	“[The inflow of external impulses] functions as a kind of a control mechanism so that we don’t miss anything significant.” (Torbjörn Nilsson, former Senior Vice President Strategy, Ericsson)
Factors influencing the importance of attraction	<p>Diverse product portfolio and heterogeneous end-users</p> <p>Distributed innovation in the industry</p> <p>Complex and turbulent competitive environment</p> <p>System or stand-alone products</p> <p>Maturity of the product area</p> <p>Centrality of product area</p>	
Approach to attraction	Active	“In terms of innovation, this is one of the areas where Ericsson is really trying to attract innovation from the outside.” (Jörgen Odgaard, former Director of Ericsson Developer Connection)
Factors creating attraction	Relationship with network operators	“We look for a larger partner like Ericsson Multimedia so that we become a more credible partner vis-à-vis the telecom operators. You need a partner that is already well known and that already delivers to the operators and has the established relationships.” (Christina Sundman, CEO, Challenger Mobile)

## Chapter 5

Continued

---

Visibility	"I believe visibility is the key. Attraction requires a certain amount of visibility before it kicks in." (Peter Gregefors, Director of Strategic Business Investments, Ericsson Multimedia)
Openness: Revealing information and sharing resources	"You have to know how to make yourself attractive in these communities. It must never look like nothing is happening and the company is stagnating. This is very important – you must feed the community all the time." (Jörgen Odgaard, former Director of Ericsson Developer Connection)
Trustworthiness	"When something is really happening and someone outside of the company feels that that they have something good, then it's important that they feel that they have been treated fair in the past because otherwise they won't come back." ( <i>Ibid</i> )

---

This information -- and the heterogeneous perspectives offered by the impulse providers -- helps Ericsson Multimedia to make sense of the complex industry dynamics it faces, both in terms of market dynamics and technological development. Niklas Sjöberg, CEO of Mozoomi, succinctly captures this finding:

"The large companies consolidate the picture and drive innovation on a larger scale. Because so many entrepreneurs come and pitch ideas, the companies get the opportunity to put together all the small puzzle pieces and see the bigger picture and how it all fits together. From this perspective, the large companies can then see when a market is ready to launch new products."

In other words, this suggests that for Ericsson Multimedia, it is not necessarily the individual impulses that the company attracts that are important, since each impulse in isolation may lack value unless it is combined with other impulses and other information that the company already possesses. Instead, it may be *the possibility of aggregating, combining, and synthesizing all of these impulses* that is the most valuable aspect of attracting an inflow of external impulses for Ericsson Multimedia. In other words, by being an attractive firm that receives an extensive inflow of external impulses, Ericsson Multimedia becomes exposed to *unique sets of information* that other, less attractive actors do not become exposed to. As argued by Sjöberg, this process may grant Ericsson Multimedia access to *a uniquely favorable vantage point* that enables the company to make sense of the industry dynamics and thereby to gain the foresight necessary to make accurate strategic decisions about which products to develop, which customers to target, and which technologies to invest in.

### **Why is attraction important for Ericsson Multimedia?**

In sum, the discussion of the previous section suggests that attraction plays a non-negligible role for Ericsson Multimedia's innovation and strategic decision making, which underscores the question of why attraction is especially relevant in this particular context. In response to this question, the analysis suggests that *the structure of Ericsson Multimedia's customer base and the structure of its product portfolio* contribute to explaining why the company can benefit substantially from the attraction of external impulses. Even if Ericsson Multimedia's customer base is comprised largely of network operators, a group that is limited in size, the company still needs to understand and cater to the needs of *the diverse population of consumers* who ultimately use the products and services that Ericsson Multimedia delivers. Because the consumers served by the company's products are *extremely heterogeneous in their behaviors and preferences*, it is difficult for the company to specialize in all parts of the market and to be receptive to the needs of the diverse population of users. This in turn means that Ericsson Multimedia can derive significant benefits from attracting ideas for new services and applications from external actors who specialize in one particular niche of the market and who seek to partner with Ericsson Multimedia.

A second factor, one that has been touched upon previously, is that certain properties of the industry render it difficult for Ericsson Multimedia to search for the externally developed innovations. One important factor that makes comprehensive searches difficult is that the production of new knowledge and innovation in this field is *highly distributed and characterized by a low degree of institutionalization*. This means that new knowledge production and innovation is conducted by many types of actors, and by actors that are dispersed across the world. Further, it is chaotic process where new actors enter the competitive sphere with new technologies and ideas while others simultaneously exit it. In other words, the innovation has not been concentrated among a limited group of actors within which these processes are conducted according to predictable patterns. Consequently, this means that Ericsson Multimedia faces an environment in which it is difficult to search and stay up-to-date with the latest developments. Thus, attraction becomes a significant factor since it contributes to informing the company about ideas and concepts that could not be captured by its own search efforts.

## Chapter 5

Third, the case analysis suggests that *the complexity and turbulence* that characterize the company's competitive environment contribute to explaining why Ericsson Multimedia benefits from attracting an inflow of external impulses. Such circumstances place great demands on a company's ability to acquire and interpret information as the basis for its strategic decision-making about factors such as which products to develop, which customers to target, and which technologies to invest in. The information and the multiple perspectives on industry dynamics that are inherent in the external impulses that Ericsson Multimedia attracts contribute to helping the company make sense of its environment by means of combining and synthesizing the information. Conversely, it can be expected that in a less complex and turbulent environment, where strategic decision making is less challenging, this level of access to diverse information and perspectives would be less important and the attraction mechanism hence less relevant.

Finally, the fact that several of Ericsson Multimedia's product areas, such as IPTV and (non voice-based) mobile services, are *new, emerging product areas that the company has entered recently* seems to contribute to explaining why the company can benefit substantially from attraction. In effect, because of the newness of its involvement in these product areas, Ericsson Multimedia has not had the time to accumulate superior internal competencies, which means that *the company is still in a state of learning* where it is gradually honing its capabilities. As such, the company is helped significantly by impulses and propositions for partnerships presented by external actors that potentially have more experience in the market than Ericsson Multimedia. Notably, this can be contrasted to Ericsson's largest business unit, Networks, which has had more time to hone its capabilities and accumulate superior internal capabilities, and consequently has much less need for attracting external impulses.

### **Competing to become a nexus of distributed information and innovation**

The study further suggests that because of the substantial benefits that accrue to firms in this industry that are attractive to external innovators and thereby function as nexuses where distributed information and innovation coincides, there is a certain level of competition in the industry to become the most attractive firm, i.e., the firm to which the largest share of ideas and inventions will be channeled. Torbjörn Carlbom, journalist and industry expert, argues that:

### *Attraction: A new driver of learning and innovation*

“It’s a game of presenting yourself as innovative, because in the technology and software business, you have to be perceived as innovative and being ahead of the competition.”

The importance of the way a company is perceived by the external environment is also reflected in Ericsson Multimedia’s strategies and courses of action. The company actively engages with its competition to achieve *a position of leadership in the perceptions of external innovators*, in order to ensure that the company attracts a large share of the important ideas and inventions that emerge in the external environment. This ambition is reflected in the following quote from former Director of Ericsson Developer Connection, Jørgen Odgaard:

“This is one of the areas where Ericsson is really trying to attract innovation from the outside.”

Ericsson Multimedia’s attraction-enhancing activities are built on a number of principles. First, the company displays openness in terms of revealing information about its technology and its future intentions in the market. These activities are largely conducted through Ericsson Developer Connection, which is intended to be the link between Ericsson and the community of external innovators. Through this forum, the company shares parts of its technology and software with external innovators.<sup>134</sup> The act of informing the community of external innovators about the company’s future intentions in terms of prioritized areas and sharing parts of its technology is intended to attract external innovators and entice them to work with Ericsson technology, which ultimately is intended to make Ericsson *a hub for distributed innovation in this field*.

In addition to these micro-level activities aimed at stimulating the inflow of external innovation impulses, it is also interesting to note that on the macro level, the choice that was made by Ericsson in 2006 was to create a separate business unit called Ericsson Multimedia. Significantly, the creation of Ericsson Multimedia as a separate business unit was undertaken at a time when very little revenue existed in the product areas that would later become Ericsson Multimedia’s core areas. The creation of Ericsson Multimedia hence did not reflect existing businesses, but rather future intentions about the

---

<sup>134</sup> Concretely, this means that Ericsson Multimedia offers technical documentation, software development kits, testing services, and developer support.

## Chapter 5

areas in which Ericsson sought to grow. The choice to create a separate business unit constituted a strong signal about the company's future intentions and served the purpose of making Ericsson's growth ambitions visible. This in itself can be interpreted as a way of establishing a position in the minds of external observers and thereby *building attraction* in the emerging field of multimedia.

★ ★ ★

In sum, this analysis contributes to explaining why attraction is of relatively high significance for Ericsson Multimedia and how the company is affected by the inflow external impulses, as well as how the company seeks to stimulate this inflow. As summarized in Table 5.3, the analysis identifies a number of ways in which Ericsson Multimedia benefits from the inflow of external impulses, including both direct effects from adopting external impulses and indirect benefits that can be extracted from the pool of impulses that ultimately are not adopted. In addition, the analysis outlines a number of factors that help explain why attraction is important to the company, such as the novelty of the company's main product areas, the complexity and turbulence of the competitive environment, and the distributed nature of knowledge production in the multimedia industry. Finally, the analysis outlines the attraction-enhancing activities that Ericsson Multimedia engages in in order to stimulate the inflow of external impulses and to establish the company as a nexus where distributed information and innovation coincide.

★ ★ ★

After having completed the within-case analyses of the three case companies, in the next chapter, the findings that have emerged from the respective case analyses will be brought together in a *cross-case analysis* where they are compared and analyzed in order to enable the establishing of a set of more general conclusions pertaining to the purpose and the research questions that were presented in Chapter 3.





# Chapter 6

## Cross-case analysis

The within-case analyses that were presented in the previous chapter revealed how attraction plays out in Autoliv, DeLaval, and Ericsson Multimedia. They further outlined how the companies are influenced by attraction, what the factors are that make them attractive to external innovators, and some of conditions under which attraction is relatively more important for them. In the first section of this chapter, these findings are compared in *a cross-case analysis*, which in the overall structure of the thesis represents the *bridge* between the empirical findings about the specific case companies and the more general answers to the thesis' four research questions that will be presented in the final sections of this chapter and in the early sections of Chapter 7.

### 6.1 Cross-case analysis

The cross-case analysis is summarized in Table 6.1, where the findings of the within-case analyses, presented in Tables 5.1, 5.2, and 5.3, are mirrored against each other, and where it is outlined how the findings relate to the research questions. The presentation of the cross-case analysis follows the order of the research questions, starting with the first question, which asks how attraction works and what the factors are that make a firm attractive to external innovators.

### **6.1.1 Different types of attraction processes**

A comparison of the case findings points to a number of commonalities in terms of the factors that make these companies attractive to external innovators. The analysis demonstrates that all three companies are *highly visible* in their respective industries and that they possess *valuable and unique resources* that exert attraction on external actors. As shown in Table 6.1, for Autoliv, it is primarily the company's relationship with the car manufacturers and its status as a first-tier supplier that makes it a highly attractive target for those actors who seek to commercialize ideas for new car safety products. Similarly, for Ericsson Multimedia, the company's long-held relationships with telecom network operators act as a powerful magnet for external innovators, since these relationships can be leveraged to more easily get their products or services accepted by the telecom operators. For DeLaval, it is largely the company's unique worldwide distribution network that makes it attractive to external innovators, since it is very difficult to commercialize new products in the dairy farming industry without having access to such a distribution network. In addition to these main drivers of attraction, the case analyses point to several *auxiliary factors* that seem to influence the extent to which the firms are attractive to external actors, such as their *receptiveness to external ideas and their trustworthiness*.

The comparison, however, shows that despite these similarities, substantial differences exist with respect to the attraction processes that operate in the case companies. As was established in the pilot study, the attraction that a firm exerts on external innovators can emerge either as a byproduct of its regular operations or can also be supported by deliberate *attraction-enhancing activities* undertaken by the focal firm. What is notable when comparing the case companies is that only Ericsson Multimedia seeks deliberately to build attraction and stimulate an inflow of externally developed ideas and inventions, whereas Autoliv and DeLaval take *a passive approach to attraction* and refrain from engaging in any attraction-enhancing activities. The comparison specifically reveals that Ericsson Multimedia, unlike the other case companies, seeks to make the firm attractive to external innovators by sharing software and technology (through its hub for external innovation, Ericsson Developer Connection) and by informing them about the product areas in which the company is on the lookout for new sources of innovation.

## Chapter 6

**Table 6.1 Summary of the cross-case analysis**

	<i>DeLaval</i>	<i>Autoliv</i>	<i>Ericsson Multi-media</i>	<i>Research question</i>	<i>Section</i>
Factors creating attraction	Global distribution network	Relationships with carmakers	Relationship with network operators	1	6.2
	Visibility	Visibility	Visibility		
	Perceived trustworthiness	Perceived receptiveness	Perceived trustworthiness Openness: Revealing information and sharing resources		
Approach to attraction	Passive	Passive	Active	1	6.2
Importance of attraction	Relatively high (but dependent on the product area)	Low	Relatively high (but dependent on the product area)	2	6.3
Factors influencing the importance of attraction	Diverse product portfolio	Focused product portfolio	Diverse product portfolio	2	6.3
	Numerous and heterogeneous customers	Few and relatively homogenous customers	Numerous and heterogeneous end-users		
	Distributed innovation in the industry	Concentrated innovation in the industry	Distributed innovation in the industry		
	Relatively stable competitive environment	Relatively stable competitive environment	Complex and turbulent competitive environment		
	System or stand-alone products	System or stand-alone products	System or stand-alone products		
	Maturity of the product area	Maturity of the product area	Maturity of the product area		
	Centrality of the product area (core or peripheral)	High cost of trying out new product ideas	Centrality of the product area (core or peripheral)		
Effects of attraction	Infuses creativity into innovation processes and stimulates broad exploration of new ideas	Occasional adoption of externally developed technological solution (patent)	Infuses creativity into innovation processes and stimulates broad exploration of new ideas	3	7.1
		Promotes learning about specific technological problems		4	7.2
	Creates opportunities to grow into new product areas	Provides diverse ideas and inventions	Expands the product portfolio	Provides early warning signals	
	Fills gaps in existing product portfolio		Drives learning about the competitive environment		

### **6.1.2 Attraction as necessity vs. attraction as competition and choice**

The case analysis suggests that one reason for why Ericsson Multimedia is more active than the other companies in this regard is that there is *more competition for the valuable new ideas* in Ericsson Multimedia's environment than in those of the other case companies. In effect, in the industry environments that surround Autoliv and DeLaval, it is very difficult for external innovators to commercialize their ideas without the support of these large incumbents. As a result of their positions of industry leadership and possession of key resources, including distribution networks and customer relationships, Autoliv and DeLaval command almost *monopoly-like positions* with respect to the commercialization of new products, which means that they can to some extent assume that most of the new ideas that emerge in their industries will be channeled to them even though they do not engage in attraction-enhancing activities.<sup>135</sup> On the other hand, because Ericsson Multimedia is active in emerging industries such as IPTV and mobile services, which are still fragmented and where no clear industry leaders have yet emerged, Ericsson Multimedia cannot to the same extent assume that it will automatically attract valuable new ideas. Instead, the company faces a stronger imperative to actively compete to attract those ideas.<sup>136</sup>

The difference between the situations faced by Autoliv and DeLaval and that of Ericsson Multimedia is illustrated in Table 6.2, which points to a distinction between attraction processes that can be characterized as *attraction driven by necessity* and those that are more akin to *attraction driven by competition and choice*. The former is characterized by a situation in which innovators have very limited choice in how to commercialize their ideas and where they almost have to seek the support of a certain firm, while the latter is characterized by a situation where innovators have multiple alternatives when it comes to commercializing their inventions and where there is an ele-

---

<sup>135</sup> Arguably, this reasoning is supported by the fact that no attempts are made at building attraction even in those product areas within DeLaval where the attraction of external ideas and inventions is considered to be of high importance, such as in its aftermarket product area, where it could otherwise have been expected that the firm would try to stimulate the inflow of external ideas and inventions.

<sup>136</sup> Importantly, however, this situation only applies to Ericsson Multimedia and not to other parts of Ericsson, such as Mobile Networks, where the company is the undisputed market leader and consequently also takes a passive approach to attraction.

## Chapter 6

ment of competition between the recipient firms to secure the best ideas.

**Table 6.2 Different types of attraction processes**

<i>Type of attraction</i>	<i>Role of recipient firm</i>	<i>Examples</i>	<i>Quotes</i>
Attraction driven by necessity	Passive	Autoliv DeLaval	<p>"If there is a small company that wants to get in, the best way is to enter through a supplier because we have the contacts and the systems. It is hard for anyone who is not currently a supplier to gain access to the car manufacturers." (Henrik Kaar, Director of Corporate Communications, Autoliv)</p> <p>"We have this global distribution network. You have very little chance of succeeding in the market unless you partner with companies like DeLaval or WestfaliaSurge and get help with the distribution." (Göran Karlsson, Director of Farm Supply and Barn Equipment, DeLaval)</p>
Attraction driven by competition and choice	Active	Ericsson Multimedia	<p>"You have to know how to make yourself attractive in these communities." (Jörgen Odgaard, former Director of Ericsson Developer Connection)</p> <p>"Whoever gets the upper hand in communication wins. It helps you attract innovators and entices smaller companies to initiate contacts, and it helps ensure that they will be positively inclined to cooperate if you contact them." (Christina Sundman, CEO, Challenger Mobile)</p> <p>"It's a game of presenting yourself as innovative, [...] because in the technology and software business you have to be perceived as innovative and being ahead of the competition." (Torbjörn Carlbom, Telecom industry expert)</p>

### 6.1.3 Differences in how the case companies are affected by attraction

In addition to the differences between the case companies' approaches to attraction, the cross-case analysis also reveals that significant differences exist with respect to how the case companies are impacted by the inflow of external ideas and inventions that they attract, which corresponds to the third research question. In effect, both DeLaval and Ericsson Multimedia adopt ideas for new products and services -- and even finished products and services -- relatively frequently, and attraction hence supports them in their efforts to grow into new product areas, such as with DeLaval's expansion into on-farm milk analysis instruments, as well as in the companies' efforts to extend and develop their existing product portfolios, such as

*Attraction: A new driver of learning and innovation*

in Ericsson Multimedia's inclusion of Accedo's applications into their IPTV offering. In the case of Autoliv, on the other hand, it is rare that external ideas or inventions that were attracted to the company are adopted. Further, on the few occasions where external impulses have indeed been adopted by Autoliv, they typically do not constitute the seeds of new products, but rather are regarded as solutions that contribute to solving existing problems related to the development of products that had already been conceived of within the company, such as in the development of the Anti-Whiplash Seat.

In the cases of DeLaval and Ericsson Multimedia, attraction is considered to be an important *vitalizing force*, as the external ideas and inventions that the companies attract are not *shaped by the same limitations*, in the form of *existing technologies and ingrained ways of thinking*, to which internally produced innovations are subject. As outlined in Table 6.1, in DeLaval and Ericsson Multimedia this process represents *a source of creativity* that propels innovation and product development into new directions and *stimulates broad exploration of new ideas*. Attraction is particularly valued in these companies because it can strengthen innovation efforts in product areas and technological domains that are *not covered by their internal core competencies*. In such areas that are peripheral from a competency perspective, the companies are often helped by the ideas of external impulse providers who, unlike the case companies, specialize in those particular areas.

On the other hand, in Autoliv, the fact that the ideas and inventions that the firm attracts are more diverse than the internally generated ideas, and that they are not built on the firm's own competencies, but on the knowledge and competencies of external actors, is considered to be a problem rather than an advantage, as the ideas and inventions often are not compatible with existing systems and technologies that are employed by Autoliv, which makes it difficult for Autoliv to adopt and benefit from them.

In addition to the *direct effects of attraction* that accrue from external ideas or inventions that are adopted by the case companies, the case analyses show that all of the case companies benefit to some extent from attracting external impulses, even in those instances where the ideas are not adopted and transformed into commercial products. Managers of all three case companies emphasize that they sometimes learn new things from their discussions with impulse providers even when they ultimately choose not to adopt the idea or in-

## Chapter 6

vention. However, although these indirect effects exist in all the case companies, substantial differences persist with respect to how important this factor is. The cross-case analysis suggests that it is most important for Ericsson Multimedia, and of least significance for Autoliv. In Ericsson Multimedia, the interaction with external impulse providers represents an important source of information for the company, as it provides it with *a multitude of perspectives* about how the industry is evolving in terms of technological development and changes in consumer preferences and behaviors. This supports the company's *strategic decision making* with respect to choosing which products and technologies to invest in and which customers to target. In Autoliv, on the other hand, the benefits of the meetings with the impulse providers are limited largely to providing insights into *specific technological problems*, and these encounters are unlikely to support the company's broader strategic decision making or strategy creation.

### 6.1.4 Differences influencing the importance of attraction

Based on the discussion in the previous section, it can be concluded that substantial differences exist between the case companies in terms of how relevant and valuable attraction is for each of them. In effect, as shown in Table 6.1, attraction plays a significant role for both DeLaval and Ericsson Multimedia, as it supports their product development and innovation, as well as stimulates higher-level learning and strategy creation, whereas it has a marginal effect on Autoliv. These differences speak directly to the study's second research question, which asks in what contexts and under what conditions attraction is important for companies. The comparison of the case companies points to a number of dimensions along which the companies differ and which can contribute to explaining these differences.

First, as demonstrated in Table 6.1, the companies differ in terms of the *breadth and diversity of their product and service portfolios*. DeLaval offers *a wide variety* of products as a consequence of its long-held strategy of supporting all aspects of dairy farmers' operations. Likewise, Ericsson Multimedia has *a wide selection* of different types of services and applications that are included in its service delivery platforms and IPTV solutions, which reflects the wide variety of applications that are in demand among end-users. Autoliv, on the other hand, has a product portfolio that is focused on *a small number of*

*Attraction: A new driver of learning and innovation*

*core products*, i.e., primarily safety systems built around seat belts and airbags, and hence does not offer a wide selection of products. This difference seems to influence the extent to which the respective companies can benefit from attracting external ideas and inventions, as the case analyses suggest that it is difficult for DeLaval and Ericsson Multimedia to develop and sustain internal expertise in all of their product areas due to the breadth of their product portfolios, whereas this is feasible for Autoliv, thanks to its narrower portfolio. Thus, it is more likely that external impulse providers possess superior capabilities in some of DeLaval's and Ericsson Multimedia's product areas than it is that external impulse providers would hold superior competencies in one of Autoliv's product areas. Consequently, it is more likely that the impulses that DeLaval and Ericsson Multimedia attract are helpful and valuable to them than it is that Autoliv would be aided significantly by the external ideas and inventions that the company attracts.

A second, related aspect is that the companies differ in terms of *how numerous and heterogeneous their customers are*. The case analysis suggests that Autoliv's customers, the major car makers, are *limited in number* and also relatively *homogenous in scope and size*, as they largely want the same type of safety systems,<sup>137</sup> whereas both DeLaval and Ericsson Multimedia have *more numerous and diverse customers*. In effect, DeLaval has a large number of customers that are relatively heterogeneous due to variations in farm sizes, as well as differences in dairy farming practices between regions and countries. Likewise, the end-users that Ericsson Multimedia ultimately targets with its applications and mobile services are numerous and highly heterogeneous in terms of their behaviors and preferences, due to differences between countries, as well as differences between user groups within the same market.

The case analysis suggests that as such, Autoliv can with relative ease identify and stay up-to-date with the explicit and latent needs of its customers, whereas DeLaval and Ericsson Multimedia have to struggle to stay informed about the needs of their customers because they are so numerous and diverse. As a result, DeLaval and Ericsson Multimedia often benefit from being approached by external actors

---

<sup>137</sup> Notably, they have different levels of willingness to invest in safety systems, but in terms of their preferences, they are relatively homogenous in the sense that they want the similar types of seat belts and airbags in their cars.



## Chapter 6

who specialize in a specific segment of their product markets and who seek to present the companies with ideas for new products or services that are specifically adapted to the needs of a particular customer group. This, on the other hand, is less likely to occur for Autoliv, since the company, due to its close cooperation with its limited customer base, typically is already highly attuned to their needs. Consequently, it can be concluded that the attraction of external ideas and inventions is more important for DeLaval and Ericsson Multimedia than for Autoliv because they are more likely than Autoliv to become informed by external impulse providers about new ways of satisfying existing or latent customer needs that they themselves have failed to identify.

A third factor that differentiates the case companies is whether they can *with relative ease search their external environment for externally developed ideas and technologies*, or if their environment is *difficult to search*, putting them at risk of overlooking potentially valuable opportunities. As pointed out in Table 6.1, the case analysis suggests that certain factors seem to render such search difficult for DeLaval and Ericsson Multimedia, whereas Autoliv is in a better position to search its own environment. Autoliv faces a situation where new innovations that are created within the field of car safety are *concentrated among a limited number of actors*, i.e., the car safety companies such as Autoliv, the major car makers, and number of academic institutions dedicated to car safety. This concentration makes it easier for Autoliv to identify and remain informed about relevant innovation and new knowledge that is created outside the company, and to search for external partners when they are needed. In contrast, both DeLaval and Ericsson Multimedia face situations where the relevant external innovation and knowledge is much more *distributed*, which makes it more challenging for them to search their own environments.

In addition, Ericsson Multimedia's environment is *highly turbulent*, as new actors continuously enter and exit the industry, which further reinforces the difficulty of staying abreast of the innovation that is conducted outside the company. In sum, these differences seem to lead to DeLaval and Ericsson Multimedia being more likely than Autoliv to fail to identify opportunities that involve external innovation, which in turn means that they are more likely to be assisted by attraction, as it can inform them about opportunities to

*Attraction: A new driver of learning and innovation*

leverage external innovation that they would otherwise have overlooked.

In addition, regarding these differences between the case companies, the within-case analyses also point to a set of differences between different product areas within the case companies which seem to contribute to explaining the conditions under which attraction is important for firms. As shown in Table 6.1, differences in *the maturity of a product area* is one such determinant, and *the centrality of a product area*, in terms of whether it is *a core or peripheral product area* for the firm, is another determinant. Finally, the case analyses indicate that *stand-alone products and integrated, system-like products* are subject to different logics with respect to attraction, which also influences the extent to which a company can benefit from attraction.

Based on the case findings and the results of the cross-case analysis, these various determinants will be discussed in further detail in Section 6.3, which investigates in greater depth the conditions under which attraction is more or less important for firms.

★ ★ ★

In sum, by conducting the cross-case analysis, a number of similarities as well as certain differences between the case companies have emerged. Specifically, the analysis points to fundamental similarities in the factors that make the case companies attractive to external innovators. It further demonstrates that attraction processes play out differently in the companies, that their approaches to attraction differ substantially, and that the companies are affected in different ways by the inflow of external ideas and inventions that they attract. These findings will provide the basis for revisiting and directly addressing the four research questions that were presented in Chapter 3. This will be done in the remaining section of this chapter, as well as in the first sections of the following chapter.

## **6.2 How attraction works and the factors that make firms attractive to external innovators - Research question 1**

The analysis of the first research question that is presented in the following section is divided into two parts. It starts with an analysis of

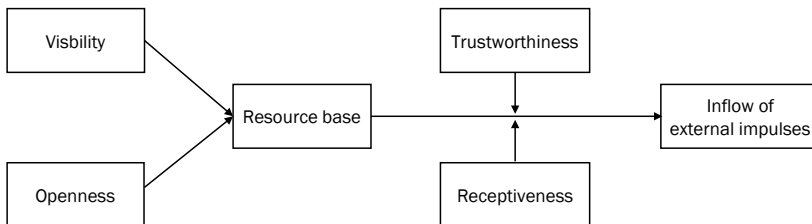
## Chapter 6

the factors that have been found to make firms attractive to external innovators, which is structured according to a simple graphical framework presented in Figure 6.1 that illustrates the main factors that shape the inflow of external ideas and inventions that firms attract. Illustrative quotes that represent the essence of these factors are also provided in Table 6.3. This analysis is then followed by a section that outlines how the fundamental components of attraction processes fit together and interact.

### 6.2.1 What makes a firm attractive to external innovators?

The cross-case analysis suggests that the primary driver of attraction is a firm's *resource base*, and that whereas the other factors that are presented in Figure 6.1 also contribute to shaping the inflow of external impulses that a firm attracts, they should rather be understood as *auxiliary factors*, as they typically do not create attraction per se, but rather support or impede the attraction that the firm's resources exert. Consequently, the firm's resource base takes center stage in the figure and is discussed first in the analysis that follows.

Figure 6.1 Determinants of attraction



#### The resource base: Valuable, unique, and fungible resources

A firm's resource base is broadly defined here to include technological competencies, reputation, distribution networks, and other tangible and intangible assets (Barney 1986, 1991, Dierickx & Cool 1989). Concretely, the study shows that the single most important factor that allows the case companies to attract external impulses is their

*Attraction: A new driver of learning and innovation*

existing customer relationships and their possession of distribution channels, a finding which is also illustrated by the quotes presented in Table 6.3. In most of the attraction processes that were observed in the case companies, the aim of gaining access to the recipient firm's distribution channels and customers was the prime motivator for the impulse providers. The distribution networks that the case companies control are particularly important for the attraction of the type of impulses that represent *nearly finished products or services*. The impulse providers behind these products or services typically perceive the case companies as a route to faster and more far-reaching market penetration than they could achieve on their own.

For less developed product ideas that are further from commercialization, however, other resources are typically of relatively greater importance for the impulse providers. For instance, in the creation of the iPod and the iTunes Store, which was described in the pilot study, it was not Apple's existing distribution channels that attracted Tony Fadell to approach the company with his vision of a new business model based on a handheld media player and a proprietary downloading service, since the vision comprised the development of a brand new distribution channel (i.e., the iTunes Store). Rather, it was Apple's capabilities in designing and marketing consumer products that Fadell was seeking to draw upon when he presented his idea to company.

On a more conceptual level, the case analysis suggests that it is not actually the company's resources per se that exert the attraction, but rather, *the services* that they can provide (cf. Penrose 1959), or even more specifically, the services that external innovators – the potential impulse providers – *believe* that they can provide. In effect, an innovator who seeks to commercialize a new product, but lacks an existing distribution channel, needs to make an assessment of which firm he or she believes possesses the necessary resources that would allow it to successfully distribute the envisioned product. Likewise, an impulse provider such as Fadell, in the case of the creation of the iPod, has to determine which company has the resources and capabilities with respect to development, design and consumer marketing that would enable it to transform the idea into a commercial product.

In certain cases, the answer to this question is obvious, as it is readily apparent which company has the resources that can render the specific services needed to commercialize a particular product idea. For instance, for an innovator that has developed a new device

## Chapter 6

to be used by dairy farmers, it may be relatively self-evident that DeLaval or one of its international competitors have the resources in place to successfully develop and distribute the product to dairy farmers. However, in other instances, such as the situation faced by Faddell, it was by no means obvious which company had the resources that would allow it to transform his vision of a handheld media player and a proprietary downloading service into a commercial product and a new business model for digital music. Importantly, in such situations, attraction becomes more subtle, as the impulse providers need to try to interpret which firm's resources have the potential to render the services that are needed to develop and distribute the products that they have envisioned.

This discussion points to a number of properties of a firm's resource base which seem to determine how much attraction the firm exerts on external innovators, and consequently what kind of ideas and inventions that it tends to attract. First, for a firm's resources to exert attraction on external innovators, they need to be *valuable* in the sense that they can provide valuable services related to the commercialization of new products (cf. Barney 1991). As an illustration of this point, DeLaval's global distribution network is valuable since it offers a simple and cost-efficient way of distributing products to dairy farmers, and this resource hence exerts strong attraction on innovators that develop products targeted at dairy farmers.

Second, and as touched upon in the previous paragraph, given that a resource is somehow valuable, the more *unique* it is in terms of the services they can provide, the stronger the attraction it will tend to exert. As illustrations of this argument, Autoliv's relationships to the car makers and DeLaval's global distribution network are both resources that exert strong attraction within their respective industries because they are *valuable* in the sense that they facilitate the commercialization of new products in their respective industries and *unique* in the sense that they are difficult and/or prohibitively expensive to imitate, as they have been accumulated over long periods of time and are subject to substantial *time compression diseconomies* (Dierickx & Cool 1989). In other words, this means that many of the ideas and inventions that emerge within an industry tend to get channeled to the firms that possess resources that cannot easily be imitated or substituted (cf. Barney 1991).

Third, an additional property of a firm's resources that contributes to shaping the inflow of ideas and inventions that the firm at-

### *Attraction: A new driver of learning and innovation*

tracts, is the *fungibility of the resources*, i.e., how broadly applicable they are, whether they can be re-deployed to render new types of services in addition to the ones that they currently provide, or whether they are highly specialized to their existing uses (Penrose 1959, Danneels 2007). The analysis suggests that if a firm's resources are perceived to be highly fungible, it will *exert attraction on a broad group of innovators* and thereby *attract a broader scope of ideas and inventions* than if the firm is perceived to have resources that are *highly specialized to its current uses*. This aspect is particularly important with respect to attracting ideas and inventions that in themselves are highly novel and do not obviously belong to any existing industry, such as Tony Fadell's vision of a new business model based upon a handheld media player and a proprietary downloading services. In that case, the impulse provider, Fadell, believed that Apple's existing resources, in terms of its capabilities in design and consumer marketing, were fungible enough to allow the company to redeploy them into the digital music sphere, which encouraged him to approach Apple, and which in turn ultimately led to that the company became exposed to the concept that would seed the development of the iPod and the iTunes Store.

★ ★ ★

In sum, the analysis suggests that these three properties of firms' resources are primary drivers of attraction and that they have a substantial impact on the inflow of external ideas and inventions that firms attract. However, in addition to these primary drivers of attraction there are, as shown in Figure 6.1, a number of auxiliary determinants of attraction, which will be discussed in the following sections.

#### **Visibility**

In addition to these properties of a firm's resources, *visibility* is another significant factor to consider when analyzing the attraction that a firm exerts on external innovators, because in order for external actors to become attracted to the firm, they must first know that it exists. Visibility in itself, however, generally does not create attraction, as a highly visible firm still may not attract a significant number of impulses if external actors cannot discern the value of pursuing combinatorial opportunities with the firm. In other words, a firm's visibility typically does not create attraction, but rather, it sets the

## Chapter 6

boundaries for the attraction that it can exert. Visibility can hence be understood as a *necessary but not sufficient condition* for attraction, which is reflected in the following quote by Peter Gregefors, Director of Strategic Business Investments, Ericsson Multimedia:

“Attraction requires a certain amount of visibility before it kicks in.”

The case analyses suggest that a firm’s visibility is often *the byproduct of its regular operations* and further, that *success in the marketplace is an important driver of visibility*, as seen in the cases of Autoliv and DeLaval, whose visibility within their respective industries is largely a result of their past successes and current dominant market positions. However, in addition to being a byproduct of a firm’s regular operations, visibility can also deliberately be sought in order to build attraction and to stimulate the inflow of external impulses. Whereas such behaviors did not appear to be common in the case companies that comprised the focus of the main study, the pilot study shows Draper Fisher Jurvetson to be a prime example of a firm that consciously *builds visibility* and *seeks to establish a presence in many people’s minds* through frequent media appearances, extensive blogging, and conference speeches in order to increase the chances of attracting investment opportunities.

### Openness

Another factor influencing the stream of impulses that a firm attracts is its degree of *openness and transparency*. Importantly, in this context, openness does not refer to a firm’s willingness to adopt external knowledge, but rather, its readiness to *reveal information* about its resource base and future strategies. The case studies suggest that when a firm reveals information about its resource base and future strategies pertaining to new products the company is developing, this revelation can stimulate the inflow of external impulses. In effect, by providing the external environment with more information, the focal firm makes it easier for external actors to identify ways in which they can combine their ideas, resources, and capabilities with those of the focal firm. In other words, by revealing key information, the focal firm facilitates external actors’ ability to “help” the firm, which is reflected in a quote from Fredrik Andersson, VP Business Development, Accedo:

*Attraction: A new driver of learning and innovation*

“When they [Ericsson] share their development plans, it triggers new ideas here.”

As has been argued previously, this method of openness has proven successful with respect to unsolved R&D problems through the process of *broadcast search* (Jeppesen & Lakhani 2010). The current study shows that a similar logic can be applied more generally. Karl Bohman, CEO of Mondozer and longtime entrepreneur in the mobile services industry, suggests that:

“If [the larger companies in the industry] would open up a bit, they would have a much better chance of finding a creative solution. Not knowing what they are doing is a disadvantage. If we knew [what they were doing], we would be able to help them much more, and understand where we could fit in.”

This statement illustrates the argument made previously and stresses how providing more information to the community of external innovators can increase their understanding of the focal firm, thereby allowing external innovators to better grasp how they can contribute. Significantly, the quote further suggest that openness not only promotes the inflow of a greater number of external impulses, but that it also may increase *the average quality of these impulses*, because instead of having to venture a guess about how their ideas and inventions might be combined with the recipient firm’s resources and how they might fit into the strategies of the recipient firm, the impulse providers can make *more informed assessments* and may even be able to specifically design ideas and inventions to fit the recipient firm’s existing needs.

However, it is important to note that from a normative standpoint, the attraction-related benefits of increased openness have to be weighed against the risks of imitation that are associated with revealing information about a firm’s resource base and future strategies. This risk is clearly taken very seriously among the case companies, as revealed by the fact that Autoliv and DeLaval, in particular, choose to reveal as little information as possible about their technologies and ongoing development projects. However, as suggested by the case description, Ericsson Multimedia acknowledges the benefits associated with revealing such information and has implemented policies and practices that support a more substantial degree of openness. Notably, such policies and practices could also be observed in the pilot



## Chapter 6

studies of Draper Fisher Jurvetson and Procter & Gamble, both of which seek to increase the number of impulses they attract and the quality of these impulses by sharing information with external actors.

★ ★ ★

Overall, the analysis demonstrates that openness and transparency with respect to the firm's resources and future intentions can increase the inflow of external ideas and inventions that the firm attracts by inspiring and stimulating external actors to identify combinatorial opportunities that involve the focal firm.

### Perceived receptiveness

The primary objective of external innovators that provide impulses is to ensure that their ideas or inventions get adopted by the recipient firm and that they get paid for their contributed ideas. However, as shown previously, most of the external impulses that firms attract are not adopted, and as a consequence of this, the likelihood that the impulse will be adopted is an important criterion for impulse providers when they are deciding which firm to approach with their ideas or inventions.

As such, a high degree of perceived receptiveness tends to allow a firm to attract a larger number of external impulses.<sup>138</sup> The case studies suggest that impulse providers have a number of ways of judging the receptiveness of different firms. In those instances where there have been previous contacts between the two parties, the experiences drawn from these interactions typically serve as the primary basis for the assessment of the receptiveness of the firm. Clearly, prior successful partnerships with the focal firm make it more likely that an impulse provider will return with new impulses. In effect, even in those instances in which an impulse provider has been rejected in the past, if the interaction and evaluation process was conducted in a timely and transparent manner, the impulse provider is likely to return in the future with additional ideas or inventions.

---

<sup>138</sup> Notably, part of a firm's perceived receptiveness to external ideas and inventions is how strong external actors perceive the firm's *absorptive capacity* to be, in terms of its *ability* to understand and assimilate external knowledge (cf. Zahra & George 2002). Another part of a firm's perceived perceptiveness pertains to its perceived *willingness* to adopt external ideas and inventions.

*Attraction: A new driver of learning and innovation*

However, many impulse providers have no prior experience interacting with a specific firm, and as such, they tend to form an opinion based on secondary sources, such as media accounts about acquisitions and partnerships. Christina Sundman, CEO of Challenger Mobile, explains that:

“It often depends on whether you perceive the firm to be open to this kind of contact. [...] When the firm’s communication with innovators is scarce, you need to form your opinion based on articles in the media. [...] We, for instance, know that Nokia is buying companies – buying content companies – and in this way, they show that they are more interested [in our product area] than is Ericsson.”

This statement illustrates how each interaction that a recipient firm has with an impulse provider is likely to create a *positive or negative reinforcement* in terms of stimulating or extinguishing the future inflow of external impulses. In effect, each time that a firm adopts an external impulse, it sends a signal to the community of external innovators that the firm is “open for business,” so to speak, which stimulates further inflow. In addition, the choices that a recipient firm makes with respect to the adoption or rejection of externally generated ideas also send signals about the product areas or technological fields in which the company is interested in receiving external impulses.<sup>139</sup>

While it may seem advantageous to attract a significant number of external impulses, it is also important to note that the inflow of external impulses creates certain costs for the recipient firm related to the handling and evaluation of the impulses, which means that projecting a high degree of receptiveness is not necessarily an optimal strategy for all firms. Rather, the current study suggests that because of the costs involved, firms face a certain tradeoff between being perceived as overly receptive, which tends to result in too many impulses, and being perceived as overly insular, which puts the firm at greater risk of missing potentially valuable impulses. The case stu-

---

<sup>139</sup> It is worth noting that these findings about how a firm’s receptiveness to external impulses contributes to either strengthening or weakening the firm’s attraction relate to the notion of an *innovation brand* that was outlined in the pilot study. There it was shown that P&G, in addition to its traditional brand building vis-à-vis its customers, also builds its brand vis-à-vis external innovators by communicating its commitment to open innovation and touting the company’s receptivity to external ideas and inventions.

## Chapter 6

dies further suggest that being perceived as highly receptive may also cause the average quality of received impulses to decrease, because greater numbers of actors may be inclined to “give it a shot,” even if their idea or invention is not of high quality or does not relate closely to the corporate strategy of the recipient firm.

### Perceived trustworthiness

The case studies further show that actors who have developed new product ideas or inventions typically are anxious that someone will ‘steal’ their ideas, and as such, they tend to be cautious about who they choose to approach when seeking to commercialize an idea or invention. The CEO of a mobile services company (name withheld), explains that:

“You are not exactly relaxed when you go to pitch your ideas to larger companies. In fact, you are really anxious to protect your ideas and you try to not reveal too much information.”

Being perceived as *trustworthy* is therefore, as also suggested by Table 6.3, an additional factor that tends to make a firm more likely to receive external ideas and inventions; conversely, a firm that is perceived as untrustworthy is likely to gain a *negative reputation* among the community of external innovators, an outcome which tends to reduce the number of external impulses the firm attracts. However, even though this is clearly something that potential impulse providers consider, this aspect should not be overstated as a determining factor of the number of impulses that a firm attracts, since the case analyses suggest that there are industries in which external innovators have little choice but to approach a certain firm if they want to have any chance of commercializing their ideas, as discussed in the previous section. In such circumstances, the external innovators are virtually forced to present the idea to that company whether or not they perceive it as trustworthy.

In other words, perceived trustworthiness is mainly a factor in situations where the impulse provider can choose between several realistic routes to commercialization, whereas in those cases where certain actors have attained an almost monopoly-like position with respect to the commercialization of new products, their perceived trustworthiness *assumes a lesser degree of significance*.

## *Attraction: A new driver of learning and innovation*

**Table 6.3 Determinants of attraction**

<i>Determinant</i>	<i>Quote</i>
Visibility	"I believe visibility is the key. Attraction requires a certain amount of visibility before it kicks in. Last year, our acquisitions got a lot of attention in the media, and immediately you could see an increase in the number of pitches we received. That proves the hypothesis that that you need a certain amount of visibility in order to create attraction." (Peter Gregefors, Director of Strategic Business Investments, Ericsson Multimedia)
Openness	"If [the larger companies in the industry] would open up a bit, they would have a much better chance of finding a creative solution. Not knowing what they are doing is a disadvantage. If we knew that, we would be able to help them much more, and understand where we could fit in." (Karl Bohman, CEO, Mondozer)
Valuable, unique, and fungible resources	"It's the resources, the recognition, the brand, and the confidence that you get just by saying that you are from Ericsson." (Karl Bohman, CEO, Mondozer)  "It's distribution. We have this global distribution network. You have very little chance of succeeding in the market unless you partner with companies like DeLaval or WestfaliaSurge and get help with the distribution." (Göran Karlsson, Director of Farm Supply and Barn Equipment, DeLaval)
Perceived receptiveness	"It often depends on whether you perceive the firm to be open to this kind of contact . [...] When the firm's communication with innovators is scarce, you need to form your opinion based on articles in the media. We, for instance, know that Nokia is buying companies – buying content companies – and in this way, they show that they are more interested than Ericsson." (Christina Sundman, CEO, Challenger Mobile)
Perceived trustworthiness	"When something is really happening and someone outside of the company feels that that they have something good, then it's important that they feel that they have been treated fairly in the past, because otherwise they won't come back." (Jörgen Odgaard, former Director of Ericsson Developer Connection)

★ ★ ★

Finally, after having outlined the various factors that have been found to influence firms' attractiveness among external innovators and which taken together contribute to shaping the inflows of external ideas and inventions that they attract, in the following section, these factors, along with the findings of the previous sections, will be revisited and tied together in order to provide *a stylized conceptualization of how attraction works*.

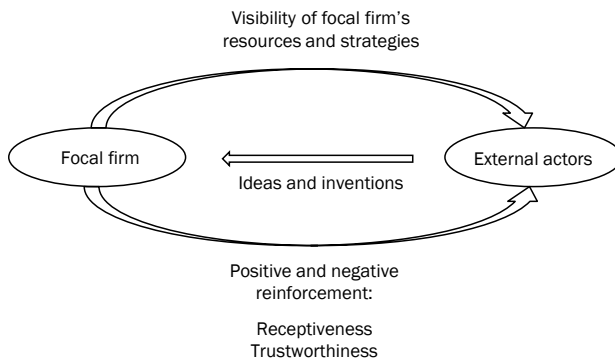
### **6.2.2 How attraction works: A conceptualization**

As outlined in the introductory chapter, a process whereby a firm actively looks for something is defined as *a search process*, whereas the process through which a firm becomes exposed to ideas and innovations as the result of an external actor approaching it is defined as *an*

## Chapter 6

*attraction process*. In response to this distinction, and in light of the fact that attraction processes have received little attention in prior studies, the current study has sought to investigate how attraction works and to identify the factors that make firms attractive to external innovators, as outlined in the first research question. In the following section, I build on these findings and tie them together by outlining the fundamental components of attraction processes, which are illustrated graphically in Figure 6.2.

Figure 6.2 Conceptualization of attraction



### Visibility and the identification of combinatorial opportunities by external actors

The figure shows how a firm, in terms of its resources and future strategies, tends to have a certain measure of *visibility* and is therefore *noticed and observed by external actors*. Further, the fact that the focal firm and its resources and strategies are observed by external actors typically triggers certain interest among some of these external actors, as they recognize *combinatorial opportunities* between their own ideas and inventions and the focal firm's resources and strategies. This in turn compels some of them to approach the focal firm and present their ideas, which creates *an inflow of externally developed ideas and inventions into the focal firm*. Importantly, as was

### *Attraction: A new driver of learning and innovation*

shown previously, the fact that firms and their resources are to some extent visible to external actors can be either a *byproduct of their regular operations* or the result of *deliberate efforts* undertaken by the firms to make their resources visible to the external actors. In terms of empirical examples, the study shows that neither DeLaval nor Autoliv undertake any deliberate efforts to make their resources and strategies visible to external actors in order to stimulate the inflow of external ideas and inventions. Rather, the key resources that make them attractive to external innovators, namely, DeLaval's global distribution network and Autoliv's close contacts with the large automakers, are visible within their respective industries as *a side effect of their dominance and successes in the product market*. Conversely, the findings show that Ericsson Multimedia seeks deliberately to *stimulate external innovators to identify combinatorial opportunities* by making aspects of its resource base more known and visible to potential impulse providers. Likewise, Procter & Gamble and Draper Fisher Jurvetson, both of which were investigated in the pilot study, devote substantial efforts to making their resources and strategies better known among external innovators in order to attract more external impulses.

#### **Positive and negative reinforcement**

Figure 6.2 further illustrates how the focal firm, depending on its behavior with respect to the inflow of ideas and inventions, provides either *positive or negative reinforcement* to the impulse providers. The analysis suggests that if a firm rejects all the external impulses that it attracts, it limits the future inflow of ideas, as it becomes apparent to potential impulse providers that their contributions are not welcome. Conversely, if the firm adopts a large proportion of the ideas with which it is presented, this will tend to stimulate further activity in relation to the focal firm and intensify the inflow of external ideas and inventions.

The analysis further suggests that the negative and positive reinforcement that a focal firm creates through its selective adoption of external ideas and inventions not only influences the overall quantity of impulses, but also determines the areas within which the firm will tend to attract impulses in the future, since potential impulse providers typically are not only attentive to the firm's general propensity to adopt, but also to the product areas or technology domains in which the firm most commonly adopts or rejects presented ideas. In addi-

## Chapter 6

tion, the behavior that the focal firm displays in terms of being fair and trustworthy towards the impulse providers creates positive or negative reinforcement. If an impulse providers perceives, based on his or her own past experiences or other impulse providers' experiences, that there is a risk that the focal firm will utilize external ideas without paying for them, they are likely to seek a different partner or seek out another way of commercializing their idea.

### **Attraction: Less direct control for the focal firm**

In sum, Figure 6.2 illustrates a process whereby the focal firm's *outward appearance*, along with *the opportunity recognition and initiatives of external actors*, are the drivers that expose the focal firm to new ideas, inventions, and opportunities. Significantly, this means that attraction processes often lie *outside of the focal firm's direct control*, since the ideas and inventions that they attract are based on the opportunity recognition and activities of external actors, who themselves decide whether they should approach the focal firm with their ideas. The control that a firm can exert over the impulses that it attracts is instead *indirect*, i.e., by trying to influence how the firm and its resources and strategies are perceived by external actors through activities such as *communication, impression management, and the selective revelation of information about its resource base and future intentions*. Notably, and as emphasized previously, this process diverges from most existing conceptualizations of how firms gain access to new opportunities, as existing formulations of the process typically focus on the focal firm's own search in terms of internal innovation through R&D and business development or external information acquisition through activities such as technology scouting, business intelligence, and environmental scanning, over which the focal firm has more direct control (Shane & Venkataraman 2000, Shane 2003).

★ ★ ★

Overall, the study demonstrates that both search processes and attraction processes contribute to informing firms about valuable new ideas, inventions, and opportunities. However, it also suggests that attraction is not equally important in all contexts, and further, that the relative importance of these two mechanisms (search and attraction) differs substantially among companies and even within different

### *Attraction: A new driver of learning and innovation*

product areas of the same company, which is an aspect of attraction that will be addressed and analyzed in following section.

## **6.3 The contexts and conditions under which attraction is important for firms – Research question 2**

Notably, whereas the analysis demonstrates that all the case companies exert significant attraction on external innovators, it also shows, as discussed above, that the extent to which these companies can benefit from the inflow of external ideas and inventions varies significantly. These differences, which are illustrated by the quotes in Table 6.4, correspond directly to the study's second research question, which asks in what contexts and under what conditions attraction is important for firms. Based on the results of the cross-case analysis, this research question is addressed in the following section, with the aim of providing more precise answers to this question than those that were offered in previous sections.

**Table 6.4 Importance of attracting external impulses**

<i>Company</i>	<i>Importance of attraction</i>	<i>Quote</i>
Autoliv	Low	"In a way, you don't need this [external inflow] so much, because you have so many ideas internally, of which you can only realize a fraction anyway." (Sture Andersson, former Vice President of Engineering, Autoliv)
DeLaval	High	"Within R&I, we are convinced that we are dependent on getting an external inflow of ideas that can then be combined with internal ideas. It is extremely important because it frees up creative resources that have not yet entered the company's limitation system." (Hans Holmgren, Director of Research and Innovation, DeLaval)
Ericsson Multimedia	High	"It's the lifeblood of the company to maintain a connection with other small, medium-sized, and large companies and to have lots of discussions with them in order to help the company continue to develop." (Jörgen Odgaard, former Director of Ericsson Developer Connection)

As was apparent from the case analyses, differences in this regard exist not only between the case companies but also *between different product areas within the case companies*. Consequently, these differences between the product areas of the case companies are acknowledged in the analysis, and based on the findings of the cross-case



## Chapter 6

analysis, the factors that influence the extent to which firms can benefit from attraction are in the following sections divided into two categories: (i) *product-level factors* related to properties of the specific product area, and (ii) broader contextual *factors* related to properties of the industry and the competitive environment.

Before addressing this question, however, it is important to note that whereas this comparative analysis of the case companies and their respective product areas is based on an empirical investigation and seems to reveal significant findings about the conditions under which attraction is more or less important to firms, it is also essential to point out that these inferences are made based on *a limited number of cases*, which suggests that caution is warranted when one evaluates the conclusions that are drawn. In other words, the findings presented in the following sections should not be understood as conclusive answers to the question, but rather as a first step towards a more complete understanding of the conditions under which attraction is important to firms.

### 6.3.1 Product-level factors

#### The maturity of the product area

The analysis suggests that the *maturity* of a product area tends to influence the extent to which a firm can benefit from attraction in that area, in the sense that firms typically benefit more from the inflow of external ideas and inventions in product areas that they have recently entered than in product areas in which they have extensive experience. The analysis further identifies two explanations for this pattern. First, the fact that a firm has recently entered a product area typically means that it is in *a learning phase* and consequently can be assisted by the knowledge contained in the external impulses that it attracts, especially since the impulse providers may have more experience in the area than the focal firm does, and therefore may possess greater knowledge. Conversely, in a firm's mature product areas, impulse providers are typically at a disadvantage vis-à-vis the focal firm's internal innovation processes because of the accumulated expertise that already exists within the firm, which means that the ideas and inventions that they can provide are rarely of sufficiently high quality to be of any significant value to the firm.

Second, a firm that has recently entered a product area is typically still *flexible* enough to be able to make use of externally developed

*Attraction: A new driver of learning and innovation*

ideas and inventions, whereas a firm with a long history in a particular product area typically has developed *a certain degree of inertia* in the form of *ingrained routines, established ways of thinking, and path-dependent technologies*, which makes it more complicated for the firm to adopt external ideas and inventions (Rumelt 1995, Gavetti & Rivkin 2007). Firms with a great deal of experience in a certain product area are also more likely to reject potentially helpful external impulses due to *overconfidence and overly optimistic conceptions of their own capabilities* (Katz & Allen 2007).

In sum, this means that firms that have recently entered a product area are both in need of the external knowledge that is inherent in the impulses they attract and still able and willing to fully benefit from it, since they have not yet become inert or overconfident. A typical example of a firm that has recently entered a new product area is Ericsson Multimedia, which in 2007 entered the market for IPTV. As shown in Table 6.5, it is acknowledged by managers of the company that because of the firm's recent entry into this market, the inflow of external impulses has helped Ericsson Multimedia to develop a more substantial knowledge base. DeLaval's milking system business and Autoliv's seatbelt and airbag businesses, on the other hand, represent examples of mature product areas where the companies have significant experience, and in which they benefit little from attracting external ideas or inventions.

**Table 6.5** The maturity of the product area

<i>Product area</i>	<i>Importance of attraction</i>	<i>Example</i>	<i>Quote</i>
Mature	Low	Car safety systems (Autoliv) Milking systems (DeLaval) Mobile Networks (Ericsson)	"Traditionally, we did everything in-house. However, in new areas, it is not a given that we need to do everything in-house. There are firms that are coming up with ideas in a different way – and better and faster than us – and we need to figure out how to incorporate that thinking, that innovation into our products and processes." (Dmitry Maselsky, Director of Group Strategy, Ericsson)
New	High	IPTV (Ericsson Multimedia) Milk analysis (DeLaval)	"When we announced that we were moving into IPTV, a lot of companies approached us with ideas, suggesting things they could do for us, and since we were kind of beginners in this area, we were helped a lot by this." (Henrik Ericsson, Strategic Product Manager, Ericsson Multimedia)

## Chapter 6

### The centrality of the product area

Related to the arguments set forth in the previous section, the analysis further demonstrates that the inflow of ideas and inventions typically is of marginal importance for companies in their own *core product areas*. The companies have the majority of their sales in these product areas, and can therefore justify substantial investments in R&D, which means that they, as suggested by the quotes in Table 6.6, typically command a degree of technological leadership that makes it difficult for external actors to improve upon the internal solutions. In addition, companies are also typically highly attuned to the needs of customers in their core product areas, which means that the “low-hanging fruit” in the sector have already been picked, and, that it is unlikely that external innovators can come up with ideas for new products that have not already been conceived of by the company itself. Typical examples of such core product areas are seatbelts and airbags in Autoliv and milking systems in DeLaval. The case studies consequently show that few externally developed ideas and inventions are adopted within these product areas and that the inflow of ideas and inventions has limited influence on innovation and product development within these product areas.

**Table 6.6** The centrality of the product area

Product area	Importance of attraction	Example	Quote
Core	Low	Seat belts and airbags (Autoliv)	“The milking we can manage pretty well on our own; it’s the core knowledge of the company.” (Tor Bratland, Director of Product Portfolio, DeLaval)
		Milking systems (DeLaval)	
		Mobile networks (Ericsson)	
Peripheral	High	Aftermarket products (DeLaval) Mobile Services (Ericsson Multimedia)	“It’s exciting for us – it gives us opportunities to grow. With the added services, we receive a great deal of help from outside ideas.” (Tor Bratland, Director of Product Portfolio, DeLaval)

Conversely, in product areas that are more *peripheral* and not closely related to firms’ core competencies, the firms can often benefit substantially from the inflow of ideas and inventions that they attract. In these peripheral product areas, there are often external actors that

### *Attraction: A new driver of learning and innovation*

have either specialized technological competencies or a particularly keen understanding of a certain customer group, either of which enables them to provide highly useful ideas and inventions to the focal firm. DeLaval's aftermarket product area represents an example of such a peripheral product area which lies partly outside the company's core competencies. As such, DeLaval benefits substantially in its aftermarket product area from ideas and inventions that are presented to the company by more specialized actors. Likewise, the case findings show that Ericsson Multimedia cannot develop all the mobile services that are in demand; the company therefore relies on external developers to approach it with ideas for new types of mobile services.

#### **System products vs. stand-alone products**

The analysis further suggests that the attraction of external impulses is more likely to be adopted and to be of value to firms in product areas that are based on *stand-alone products or services*, rather than in product areas that are based on *integrated systems*. As illustrated by Table 6.7, the analysis demonstrates that in product areas such as DeLaval's aftermarket product area, which is largely built on stand-alone products, the attraction of externally developed ideas and inventions has a substantial impact on companies' innovation, whereas in system-based product areas, such as DeLaval's milking systems and Autoliv's safety systems, external innovators often struggle to gain any traction whatsoever inside the recipient firms.

**Table 6.7 System products vs. stand-alone products**

<i>Type of product</i>	<i>Importance of attraction</i>	<i>Example</i>	<i>Quote</i>
System	Low	Car safety systems (Autoliv) Milking systems (DeLaval)	"The problem is getting ideas from the outside that make any sense. Ericsson is a system-building organization which means that it is not individual inventions that matter." (Göran Hoff, former Director of Ericsson Business Innovation) "It is harder now. Previously, you could just invent a gadget, but now everything needs to be integrated in systems." (Torbjörn Petterson, Senior Milk Extraction Specialist, DeLaval)
Stand-alone product	High	Aftermarket products (DeLaval)	"It is important to have a broad and attractive product assortment – you fill out those gaps." (Göran Karlsson, Director Product Portfolio)

## Chapter 6

The case analysis suggests that external actors fail to contribute within these areas because it is often difficult for them to understand how these complex systems can be improved, as they typically lack a comprehensive understanding of how the systems work. As such, external ideas and inventions often are *not relevant* in these areas, because they are based on flawed assumptions about how existing products actually work and hence are not compatible with the existing solutions.

### **The structure of the product portfolio and the customer base**

The analysis further suggests that *the structure of a firm's customer base* (in terms of the number of customers and the degree of heterogeneity among them) and *the structure of its product portfolio* tend to have a significant effect on the extent to which companies can benefit from attracting external ideas and inventions. In effect, the analysis demonstrates that firms with *numerous, heterogeneous customers and diverse product portfolios* typically can benefit more from attracting externally developed ideas and inventions than firms with *few, homogenous customers and focused product portfolios*. The reason for this seems to be that the more diverse and segmented a firm's customer base is, and the more diverse its product portfolio is, the more difficult it is for the company to identify all the existing or latent needs among its multitude of customers and to be highly specialized in all of its product categories.

As such, the firm can be helped significantly by external actors that specialize in a particular customer segment, market niche, or product category. For example, in DeLaval's highly diverse aftermarket product area, the multitude of customers and the heterogeneity among these customers (in terms of farm size, prevailing regional farming practices, personal preference, and many other factors) make it impossible for the company to identify all possible new product ideas and to be specialized in all the sub-product categories. Consequently, the company derives substantial assistance from the inflow of external impulses.

Conversely, if a company has a small number of homogenous customers to whom it can deliver a limited range of standardized products, it typically has a limited need for external ideas and inventions, as it tends to *co-evolve with its customers*. As shown by the quote in Table 6.8, such companies tend to be highly attuned to their customers' needs and to have attained specialization in a set of core

### *Attraction: A new driver of learning and innovation*

technologies and processes based on these needs, *leaving little room for the contributions of external innovators*. This situation is particularly salient in the case of Autoliv, where the company has a limited number of customers, i.e., the automakers, to whom it delivers a small number of core products and with whom it cooperates closely with respect to innovation and product development. Autoliv is well aligned with its customers' needs, and the company consequently makes little use of the inflow of external ideas and inventions.

**Table 6.8 Structure of customer base and product portfolio**

<i>Customer base</i>	<i>Importance of attraction</i>	<i>Example</i>	<i>Quote</i>
Few, homogenous customers and a focused product portfolio	Low	Car safety systems (Autoliv)	"If you have as close a cooperative relationship with Volvo as we do, then sometimes [the ideas] come from Autoliv, sometimes from Volvo. It is like when you work together in a small group and come up with new things, you can't tell afterwards who came up with what." (Sture Andersson, former Vice President of Engineering, Autoliv)
Many, diverse customers and a diverse product portfolio	High	Milking equipment (DeLaval) Mobile services (Ericsson Multimedia)	"They (entrepreneurial firms) often know the market better than we do. Sometimes they specialize in a very limited and narrow area, but they know it very well." (Uzi Birk, Senior Technical Director at DeLaval)

### **6.3.2 Contextual factors**

#### **The degree of complexity and turbulence of the competitive environment**

In addition to these explanations related to the product area in question, the analysis further suggests that *the degree of complexity and turbulence in the competitive environment* influences the extent to which companies benefit from the inflow of external impulses (Dess & Beard 1984, Lane & Maxfield 1996, Mosakowski 1997). Specifically, the findings show that firms that operate in *turbulent and complex industries* can benefit *more* from the inflow of external impulses than those in more *stable and predictable environments*. In stable environments where change progresses along more or less predictable paths, such as in DeLaval's business of milking systems and Autoliv's business of seatbelts and airbags, the inflow of external ideas typically has a modest impact. On the other hand, in turbulent and complex

## Chapter 6

environments, such as the IPTV industry in which Ericsson Multimedia is active, attraction tends to be of greater significance.

Two main explanations for this pattern have emerged. First, in complex environments where predictability is low, firms are more reliant on *an inductive learning mode* wherein many different ideas, models, and strategies are attempted on a trial basis and then evaluated ex post (Mosakowski 1997, Regnér 2003). Significantly, such a learning mode is dependent on variation in terms of product ideas, technologies, and other factors, since this variation constitutes the raw material for the experimentation and inductive learning. Because the inflow of external ideas and inventions typically is a source of variation, as the impulses originate among a diverse group of actors with different technologies, knowledge structures, practices, and ambitions, firms that need more variation can also often benefit from this inflow. Firms in stable environments, on the other hand, tend to employ *a deductive learning mode* that is based on planning and deductive reasoning, and in which variation is much less important, since decisions can be made without extensive experimentation with different options (Regnér 2003). Consequently, firms in stable and predictable environments typically do not benefit substantially from the added variation that is inherent in the external ideas and inventions that they attract.

Second, firms in stable and predictable environments have typically acquired an accurate sense of where the useful knowledge in their industries resides, which means that to the extent that they need external expertise or partners, they can usually identify them through their own search. This means that attraction typically offers few opportunities that the recipient firm was not already aware of. Conversely, however, if the environment is unpredictable and subject to constant change, the difficulty of identifying the relevant external expertise and complementary partners tends to be much greater. The study of Ericsson Multimedia, for instance, suggests that the high level of dynamism in the company's competitive space, with new firms constantly emerging while others simultaneously exit the market or change their strategic focus, makes it very challenging for the company to stay informed about the external knowledge and expertise that exist in the environment. Consequently, under such circumstances, there is a higher likelihood that attraction can inform the focal firm about valuable external knowledge and expertise of which it was previously unaware.

*Attraction: A new driver of learning and innovation*

However, after having argued that attraction tends to be more important in complex and turbulent environments, it is worth pointing out a caveat regarding this finding. In effect, it is important to note that if the predictability and stability of the environment strongly influences *a firm's search behavior*, in the sense that increasing complexity and turbulence triggers the firm to increase its exploratory search, and conversely that higher predictability and stability induces it to *reduce its own search-based exploration* in terms of exploratory R&D, environmental scanning, and technology scouting, because it perceives that such activities are not needed, then the relationship outlined above may not hold true. In that case, attraction can become relatively more important in a predictable and stable context because it represents *the only exploration mechanism that is in place* for the firm, since it has chosen to reduce its search-driven exploration.

**Table 6.9** The degree of complexity and turbulence

<i>Industry conditions</i>	<i>Importance of inflow</i>	<i>Example</i>	<i>Quote</i>
Predictability and stability	Low	Milking systems Seatbelts & Airbags	"Generally speaking, I believe that our personnel are maybe the most up-to-date with what is going on in the market." (Jan Olsson, Vice President Research, Autoliv)
Complexity and turbulence	High	IPTV	"What is really new is that we need to test a lot of things. It is really hard for us to see what the next big thing will be. It is like being a book publisher. If you receive 100 books to consider for publication, there is no way of telling which one will be a bestseller. The only way of getting a bestseller is to get 100 books out in the stores and see which ones people like." (Dan Farman, Senior Advisor, Ericsson Multimedia)

In sum, this suggests that *ceteris paribus*, in the sense that the intensity and scope of the focal firm's search is held constant, attraction is relatively more important in complex and turbulent environments, because it is more difficult in such circumstances for a focal firm to stay up-to-date with the location and nature of important knowledge in the external environment, and as such, the chances are higher that external impulse providers will offer the firm information it does not already possess. However, if the degree of complexity and turbulence have a significant effect on a firm's search behavior, in the sense that high complexity and turbulence compel



## Chapter 6

the firm to intensify its own search, which in turn reduces the firm's need for attracting external impulses, then this relationship may be moderated and possibly even reversed, as search and attraction are, to a certain extent, able to function as substitutes for one other.

### **The degree of concentration of innovative activity in the external environment**

Within an industry, innovative activity can be either *dispersed or concentrated* (Chesbrough 2003a). This is illustrated by how innovation in the automotive safety system industry is highly concentrated in the sense that innovative activity largely occurs within a small number of large organizations, i.e., the major car makers, the large first-tier suppliers such as Autoliv, and a number of academic institutions, whereas innovation in the emerging competitive space for mobile services and applications is highly dispersed, as innovative activity takes place among many different types of actors, including a wide variety of small start-up firms and established companies that are located all across the world. The analysis suggests that attraction is *relatively more* valuable for firms that are active in the latter category of contexts, where innovative activity is *widely dispersed*. It further suggests that the explanation for this is that identifying the relevant external innovation through search is more difficult in industries where innovation is widely dispersed. As such, the probability is higher that attraction will inform firms about opportunities that they had failed to identify through their own search.

In effect, in industries where innovation is highly concentrated, such as the automotive safety industry, the identification of external sources of innovation that can be combined the firm's own resources and capabilities is *relatively trivial, since the search space is limited*. This means that a firm such as Autoliv is less likely to be helped by attraction, since the company to a large extent can stay up-to-date with the interesting innovation that emerges in the industry through its own search. On the other hand, in a competitive space where innovative activity is widely dispersed, such as the one facing Ericsson Multimedia, it is highly challenging to identify the relevant external innovation because *the search space is so vast*, and it is impossible for any single firm to be aware of all potential combinatorial opportunities between itself and all external innovators, even if it allocates substantial resources to monitoring and scouting the external environment. As a result, significant asymmetries tend to arise between

### *Attraction: A new driver of learning and innovation*

attraction and search, in the sense that substantial differences emerge between the pool of ideas and inventions that firms identify through their own search and the pool that they attract from external innovators. As argued above, this in turn increases the likelihood that attraction will inform firms about opportunities that they would otherwise have overlooked.

**Table 6.10** The degree of concentration of innovative activity

<i>Industry conditions</i>	<i>Importance of attraction</i>	<i>Example</i>	<i>Quote</i>
Concentrated innovation and knowledge creation	Low	Seatbelts & Airbags	"The new products generally come from the big first-tier suppliers such as Autoliv" (Henrik Kaar, Director of Corporate Communications, Autoliv)
Dispersed innovation and knowledge creation	High	Mobile services	"There is an enormous amount of experimentation going on in mobile services. Many actors feel inclined to experiment in this area." (Fredrik Backner, Director of Product Management, TeliaSonera)

### **6.3.3 Conclusions about when attraction is important**

Based on the analysis of the previous sections, a set of more general conclusions can be drawn about the circumstances under which attraction is important for firms. Specifically, the analysis suggests that *two basic conditions* need to be in place in order for the attraction of external impulses to be of value for a recipient firm. First, the external community of innovators must in some way, or in certain areas, *have an advantage over the internal innovation processes of the recipient firm*. If the external community has no such advantage, the firm typically would rather rely on its internal innovation, and attraction will be a non-factor. As shown by the analysis, the recipient firm typically has an advantage over external innovators (the impulse providers) in their own core product areas, in their mature product areas, and if they have few, homogenous customers and focused product portfolios. Under such conditions, attraction is typically of limited significance for the recipient firms, as their internal innovation generally is superior to the externally created ideas and inventions that they attract. However, on the other hand, in *peripheral or novel product areas*, firms are often *assisted significantly by the external impulses that they attract*, as the impulse providers often have

## Chapter 6

specialized capabilities in these areas that are superior to the recipient firms' own capabilities. Likewise, if a firm has *numerous and heterogeneous customers*, there is a significant chance that external innovators may possess an advantage over the firm in some particular segments of the market, and that the impulses they provide the firm can be of substantial value, as they may point to new and better ways of satisfying the firm's customers.

Second, assuming that external innovators have such an advantage, there must also be circumstances that make it *difficult* for the focal firm to search for and identify the relevant external innovation, because if a firm easily and at a low cost can search and identify the relevant ideas, inventions, and opportunities, attraction will primarily inform the recipient firm about things that were readily available to it anyway. As outlined above, the analysis demonstrates that it is typically difficult for a firm to comprehensively search its environment in contexts characterized by *complexity, turbulence, and dispersed innovation*, and that it consequently is likely that *attraction under such circumstances can inform firms about opportunities that it would otherwise have overlooked*.

Altogether, the empirical findings from the study suggest that is relatively common that these two conditions are in place and that most firms, to some extent, can benefit from attraction, even if significant differences exist both between companies and between different product areas within the same companies with regards to how much they can benefit from attracting inflows of externally developed ideas and inventions.

### 6.4 Summary of Chapter 6

In this chapter, research questions 1 and 2 have been explicitly addressed by outlining and analyzing: (i) how attraction works and the factors that make firms attractive to external innovators, and (ii) under what conditions and in what contexts attraction is important for firms. These findings are briefly summarized in Table 6.11, which points out how attraction is constituted by the ways in which a firm's resources and strategies are perceived and interpreted by external innovators, who, based on their understanding of the firm's resource base and strategies, identify combinatorial opportunities between their own ideas and inventions and the resources of the focal firm,

*Attraction: A new driver of learning and innovation*

and subsequently decide whether to approach the firm to present it with these opportunities.

**Table 6.11 Summary of research questions 1 and 2**

<i>Research Question</i>	<i>Findings</i>
1. How does attraction work and what are the factors that make firms attractive to external innovators?	<p>How attraction works:</p> <p>The combination of a focal firm's outward appearance in terms of the visibility of its resources and strategies along with the identification of combinatorial opportunities by external innovators that combine their ideas and inventions with the resources and strategies of the focal firm creates an inflow of externally developed ideas and inventions for the focal firm.</p> <p>Factors that make firms attractive:</p> <p>Valuable, unique, and fungible resources</p> <p>High visibility</p> <p>Openness and transparency about resources and future intentions</p> <p>High perceived receptiveness to external ideas and inventions</p> <p>High perceived trustworthiness vis-à-vis impulse providers</p>
2. In what contexts and under what conditions is attraction important?	<p>In peripheral product areas</p> <p>In new product areas</p> <p>In product areas based on stand-alone products</p> <p>For firms that have a diverse customer base and product portfolio</p> <p>In complex and turbulent competitive environment</p> <p>In environments characterized by dispersed innovation and knowledge creation</p>

The table further reveals how *highly visible* firms that possess *valuable, unique, and fungible resources* tend to be attractive to external innovators, and that the attraction a firm exerts is reinforced if it is perceived as *receptive and trustworthy* and also displays a high degree of *openness and transparency with respect to its resources and future intentions*. In addition, the table demonstrates that attraction tends to be relatively more important for firms in *new or peripheral product areas* and for firms that have a *diverse customer base and product portfolio*. It further reveals that firms that are active in contexts characterized by *complexity and turbulence*, and where *innovation is widely dispersed* and is carried out by a large number of actors, tend to rely more on attraction than other firms.

# Chapter 7

## Discussion and conclusions

In the preceding chapter, the findings of the case studies were compared in a cross-case analysis. Specifically, research questions 1 and 2 were explicitly addressed as the analysis outlined how attraction works, what the main factors are that make firms attractive to external innovators, and the conditions under which attraction is more important for firms. As the next step of the research process, this chapter addresses research questions 3 and 4 by investigating (i) how firms are affected by attraction, in terms of how it influences learning, innovation, and strategy creation, and (ii) how attraction differs from previously described search-based exploration mechanisms.

Notably, these questions were briefly touched upon in the introduction where certain preliminary ideas were presented in response to these questions. Based on the empirical findings and the subsequent analysis, more comprehensive answers can however be provided at this stage. Outlining empirically grounded answers to these questions corresponds directly to the purpose of the study, which is to investigate attraction and thereby to offer an alternative perspective on how firms explore new opportunities and discover non-local ideas and innovations, in order to further our understanding of how firms can sustain and renew their competitive advantage over time through learning and innovation. In order to meet this aim, the conclusions of the study will also at the end of this chapter be condensed into *a set of propositions* intended to capture the essence of the findings of the study.

### **7.1 How attraction influences learning, innovation, and strategy creation - Research question 3**

The cross-case analysis that was conducted in the previous chapter outlined how the case companies are affected by attracting external ideas and inventions. In this section, these findings are brought together and organized into a basic framework that classifies different types of impulses and the ways in which they impact the recipient firms. As follows from the literature review presented in Chapter 2, there are no existing frameworks that can be used for analyzing attraction, and as such, the framework that is employed here has been empirically derived. The framework is presented in Figure 7.1 and represents a simple 2x2 matrix that builds on two important distinctions that were derived from the case analyses.

First, the framework distinguishes between those impulses that *have been adopted* by the recipient firm and those that *have been rejected*. In this study, the adoption of an impulse is said to have occurred when the recipient firm engages in an exchange with the impulse provider and makes direct use of the impulse by developing a new product or service based on it, after having purchased the intellectual property underlying the impulse or having engaged in a joint development project with the impulse provider. This distinction was deemed essential based on the within-case analyses, as they show that not only the impulses that are adopted are relevant, but that the pool of impulses that are not adopted can also play a significant role for the recipient firm and that they hence also need to be considered.

Second, it distinguishes between, on the one hand, impulses that are *aligned* with the existing knowledge base of the recipient firm, in the sense that they are congruent with the existing technologies that are employed within the recipient firm (Patel & Pavitt 1997); the dominant logic of the recipient firm (Prahalad & Bettis 1986, Walsh 1995); and its existing corporate strategy (Burgelman 1983b); and, on the other hand, those impulses that *bring substantially new knowledge to the recipient firm* and differ from the recipient firm's existing technologies, dominant logic, and corporate strategy (Ahuja & Lampert 2001). This distinction reflects the results of the case analyses which show that the impulses that the case companies attract range from ideas and inventions that are closely related to existing product areas (and which may even have already been conceived of within the company) to those that radically differ from existing knowledge and

## Chapter 7

technologies within the recipient firm.<sup>140</sup> Because this was shown to be associated with *different types of effects* on the recipient firms and *different types of adoption processes*, it was considered a vital dimension when analyzing how firms are affected by attraction. Based on these two dimensions, four typical ways in which firms are influenced by attracting external impulses can be identified, as is illustrated in Figure 7.1. In the following section, each of these generic ways in which firms are affected by attracting external impulses is analyzed.

Figure 7.1 Effects of attraction

<i>Impulse not aligned with existing knowledge</i>	Indirect innovation and learning	Radical innovation
<i>Impulse aligned with existing knowledge</i>	Redundant	Incremental innovation
	<i>Impulse rejected</i>	<i>Impulse adopted</i>

### 7.1.1 Radical innovation

The upper right-hand corner of the matrix represents those instances where the impulse is adopted and where the idea or invention adds *substantial new knowledge* to the recipient firm. Because of the high degree of new knowledge that is inherent in the impulses that fall

---

<sup>140</sup> Depending on the type of impulse, this distinction between a high and low alignment with the recipient firm's existing knowledge can carry somewhat different interpretations. If, for instance, the impulse consists of a technological solution, then a minor modification of existing solutions in the recipient firm is considered to be aligned, whereas a technology that has not been used by the recipient firm is considered to be not aligned. On the other hand, if the impulse consists of an idea for a new product, an extension of an existing product category is aligned, whereas an idea for an entirely new product is considered not to be aligned.

within this category, these processes are akin to radical *innovation* (Dewar & Dutton 1986). The concept of radical innovation was first discussed by Schumpeter (1934) and has subsequently been subject to much attention, as well as having been defined in multiple ways (Henderson & Clark 1990, McDermott & O'Connor 2001). A synthesis of these different definitions is offered by Sleifer et al. (2000 pp. 5), who state that “radical innovation concerns the development of new business or product lines – based on new ideas or technologies or substantial cost reductions.”

Ahuja & Lampert (2001) further state that innovation can be radical either from *a technological perspective or a user/market perspective*; this is a distinction that is consistent with the findings of this study, as the case analyses suggest that the impulses that fall within this category primarily influence the recipient firm in two different ways, as they may provide it with: (i) *the seeds of the development of new products or product areas*, and (ii) *a new technology that enables it to produce an existing product in a new way*. Consequently, in the following section, the concept of radical innovation will encompass both technological innovation that is based on a different set of engineering and scientific principles than those that previously dominated in the recipient firm, and product innovation that opens up new markets for the recipient firm (Henderson & Clark 1990).

### **Seeds of new products**

The creation of the DeLaval Cell Counter and the ensuing development of the Herd Navigator system represent a salient example of an instance in which an external impulse provided *the seeds of a new product*. In this case, the type of product that ChemoMetec proposed to DeLaval had not previously been conceived of within DeLaval, and both the idea and the underlying technology were hence novel to DeLaval. The case description also shows that the idea from ChemoMetec not only led to the development of an individual product, but also enabled DeLaval to create an entirely new product area for on-farm milk analysis systems that did not previously exist within DeLaval, nor elsewhere in the industry, which suggests that it qualifies as a radical innovation. In addition, from a competency perspective (Prahalad & Hamel 1990), the technology that was refined during the creation of the DeLaval Cell Counter has formed the basis for DeLaval's development of a new competency in milk analysis technology that did not previously exist within the company, and which has become



## Chapter 7

an important part of DeLaval's strategy of supporting the productivity of its customers by providing them with instruments for analysis and decision support.

The creation of the iPod that was described in the pilot study offers an additional example of how the development of a new product area within an established firm was initiated by an externally conceived idea. The case analysis shows how the idea that triggered Apple to enter the digital music industry with a new business model based on a handheld media player, the iPod, and a proprietary downloading service, the iTunes Store, was initially envisioned by entrepreneur Tony Fadell, who approached Apple to present the company with the opportunity at a time when it had virtually no presence in the digital music sphere. Notably, this leap into the digital music industry by Apple with the creation of the iPod and the iTunes Store that was triggered by Fadell's idea not only constituted a radical product-level innovation but also represented a significant *development of Apple's corporate strategy*, as it catapulted Apple from being largely a computer company into also being a major player in the digital music industry, a domain within which it today earns a substantial share of its revenues.

Conceptually, these and other similar cases can be described as instances in which an external impulse inspires the recipient firm to *put its resources to novel use* so that they can be used to produce new products and services and thereby to drive growth (Danneels 2002, 2007). The analysis of the creation of the DeLaval Cell Counter shows how the company's competencies in manufacturing and distributing systems for dairy farming were redeployed and utilized to commercialize milk analysis instruments. Likewise, the analysis of the creation of the iPod and the iTunes Store demonstrates how Apple's competencies in consumer marketing and designing consumer products were leveraged and re-deployed to allow the company to grow into the digital music industry. Significantly, such processes represent a subset of *the growth process* described by Penrose (1959), whereby growth in established firms is driven by the identification of new ways of employing the firm's resources so that they can be used to produce new types of products or services. Compared to Penrose's conceptualization of the growth process, the novelty of the process described in the current study is that the new opportunities to redeploy the firm's resources are identified not by the managers of the focal firms, but by *external actors who seed the growth processes* by in-

### *Attraction: A new driver of learning and innovation*

forming the recipient firm about new products that they could potentially develop. Effectively, these examples suggest that if a firm is attractive to external innovators, a greater number of new ways of leveraging the firm's resources to grow into new product areas will tend to be identified.

#### **New technologies in existing product areas**

The introduction of a new type of cooling technology to DeLaval's product area for cooling systems on the other hand represents an example of how an external impulse can introduce *a radically new technology to an existing product area*. Notably, these types of processes do not make it possible for the recipient firm to grow into a new product market; instead, the external impulse replaces an existing technology with a new technology that is superior in some key dimension, such as in the case where the introduction of new cooling technology enables DeLaval to offer cooling systems that consume less energy than do traditional solutions, which in turn creates cost savings for the customers.

The introduction of FM synthesis to Yamaha's electronic instrument product area represents another example where an external impulse enabled the recipient firm to develop and improve an existing product area based on a new technology that radically differed from existing solutions. In this case, FM synthesis, which had been invented by Stanford professor John Chowning, allowed Yamaha to move from analog to digital technology in its electronic instruments business, which would prove to be a more cost-efficient technology and allow the company to develop more sophisticated instruments with a range of new features.

#### **Challenges and obstacles**

When evaluating these examples, it is important to note that even though the case findings suggest that such impulses can be very important for the recipient firms if they are adopted, it is also clear that outcomes in which ideas for products or technologies that deviate significantly from the recipient firm's existing corporate strategy, technologies, and mindset are adopted are *relatively rare*. As emphasized previously, the attraction processes described in this study are not typical cases, but rather, success cases. In fact, the case analyses demonstrate that adopting ideas for completely new products or

## Chapter 7

technologies is a complicated process that typically tends to encounter a number of obstacles. The analysis indicates that a significant share of such impulses are *incompatible* with the existing ways of operating in the recipient firms and that such external impulses that contradict existing ways of thinking and operating tend to be met with certain resistance within the recipient firms, which leads to that they are often rejected. It is further found, in accordance with the analysis presented in the previous chapter, that this tendency is particularly powerful in those instances where the impulses target the recipient firm's core product areas or core technologies. In such areas, the managers of the recipient firms are typically highly confident, and even potentially over-confident, with regard to the firm's internal capabilities and are therefore prone to rejecting external impulses, whereas impulses that target more peripheral areas in the recipient firms are more likely to be adopted.<sup>141</sup>

The findings further suggest that the internal resistance against adopting external ideas and inventions that deviate from existing technologies and mindsets is particularly strong when these seek to *replace an existing technology or product*, whereas they are more likely to be adopted if they represent *extensions of the firm's product portfolio or technological portfolio*. Notably, this finding is largely consistent with previous findings that established firms are typically reluctant to adopt new technologies or products if these *cannibalize* their existing investments in technologies, routines, or market positions (Christensen 1997, Chandy & Tellis 1998, Danneels 2008).

An additional factor that impedes the adoption of external impulses with high new knowledge content is that such impulses typically require the recipient firm to commit substantial resources in order to put them to commercial use, since these types of concepts typically need to undergo lengthy adaptation and development. This tends to make it more difficult for external impulses to gain traction inside the recipient firms since competition for development re-

---

<sup>141</sup> These findings are also largely consistent with previous findings about the '*not-invented-here syndrome*,' in which novel solutions that are developed outside the company are often met with more resistance than internally developed solutions (Katz & Allen 2007). The findings are also consistent with the notion of a *corporate immune system*, which is constituted by the selection mechanisms that counteract the introduction of "alien" concepts into the firm, and which is known to counteract the adoption of novel ideas that originate outside the organization (Birkinshaw & Ridderstråle 1999).

### *Attraction: A new driver of learning and innovation*

sources typically is fierce within the recipient firms, with multiple actors seeking to gain support for their ideas and initiatives.<sup>142</sup>

★ ★ ★

In conclusion, the analysis suggests that impulses with high new knowledge content can generate substantial benefits for the recipient firms by enabling *radical innovation* and triggering *the exploration of new opportunities* (March 1991, Ahuja & Lampert 2001). As shown by the examples discussed in the previous section, such impulses can, specifically, trigger growth into new product areas and enable the recipient firms to replace their current technologies in existing product areas with new technologies that allow their product portfolios to be updated and improved. However, the analysis also demonstrates that the adoption of such impulses tends to be high-risk ventures that require the recipient firms to dedicate substantial development resources to making them commercially viable and compatible with its existing solutions, which leads to that a limited share of all such impulses are adopted by the recipient firms.

#### **7.1.2 Incremental innovation**

It is important to note that not all the external impulses that firms attract are based on a radically different knowledge base than that which is present within the focal firm, nor do all attracted impulses deviate significantly from the recipient firm's existing corporate strategy, technologies, or dominant logic. Instead, a significant share of the external ideas and inventions that firms receive and subsequently adopt are largely consistent with the current ways of working and thinking that exist within the recipient firms, and the adoption of these types of impulses tends to support *incremental innovation* rather than the previously discussed radical innovation. As discussed in Chapter 2, incremental innovation is known to be a dominant mode of innovation within established firms and is characterized by the introduction of relatively minor changes to the existing product and exploits the potential of the established technologies and designs

---

<sup>142</sup> This finding is also consistent with Dutton & Ashford's (1993) and Dutton et al.'s (2001) findings that multiple actors within companies seek continuously to "sell" their own pet issues and agendas to the managers that control the allocation of resources to new projects and initiatives.

## Chapter 7

(Henderson & Clark 1990, Baumol 2002, Hill & Rothaermel 2003). In the following sections, the different ways in which the attraction of external ideas and inventions supports incremental innovation in the case companies are outlined and discussed.

### A pipeline of new products

The processes through which external impulses of this type are adopted often follow a different logic than the one described in the previous section. An impulse that is consistent with certain aspects of the recipient firm is typically *easier to adopt*, in the sense that it requires less time and resources in order to adapt it to meet the requirements of the recipient firm. The downside compared with impulses with high new knowledge content is that impulses with lower new knowledge content typically can only deliver extensions of existing products or minor modifications of the firm's existing technologies, and as such, the individual contribution of each impulse tends to be relatively marginal. A typical example of such processes occurs when DeLaval is approached by external actors who have developed products that fit into DeLaval's aftermarket product portfolio, such as a new type of a cow brush, a better detergent, or other products that can easily be accommodated within the frames of the existing product portfolio and corporate strategy. Another example occurs when external developers of mobile services approach Ericsson Multimedia with new applications that can easily be added to the company's existing application portfolio and where each new such service represents a small addition to Ericsson Multimedia's total sales.

However, it is important to note that the marginal contribution of each individual impulse does not imply, per se, that this type of impulse is less important than impulses with high new knowledge content. The reason is that whereas each individual impulse is not as important, *the aggregated inflow of such impulses can be very important*. As an illustration of how the aggregated effects of attracting and adopting this type of impulses can accumulate, Fredrik Backner, Director of Mobility at one of Ericsson Multimedia's key customers, TeliaSonera, states with respect to the mobile services market:

"I don't believe that any 'killer apps' will ever emerge in this business. It's more a matter of having a large portfolio of services and continuously extending it."

### *Attraction: A new driver of learning and innovation*

The case analysis suggests that the same logic applies to Ericsson Multimedia, in the sense that each individual new service that the company attracts and adopts generally is of limited importance for the company, but the inflow of impulses in aggregate contributes to shaping the company's mobile services portfolio and its future strategy in the mobile services market.<sup>143</sup>

#### **Puzzle pieces that solve existing problems**

An additional way in which an external impulse that is aligned with the recipient firm's knowledge base can affect the recipient firm is by constituting *the puzzle piece* that enables the company to solve an existing problem that has hampered the development of a new product. Autoliv's creation of the Anti-Whiplash Seat represents an example of this type of pattern, as the case description shows how Bo Swedenklef's invention of a solution that alleviates some of the harmful effects of rear-end collisions helped Autoliv develop a new type of product that did not previously exist in the market. However, unlike the creation of the DeLaval Cell Counter, in this case, the idea for the product had already been conceived of within Autoliv, and as the company was already engaged in a technological search for a functioning solution, ideas that were somewhat similar to Swedenklef's invention had already surfaced within Autoliv (although none of the internal solutions were satisfactory).

This example illustrates how the solutions to existing R&D-related problems in established firms may exist outside of the company, and that these solutions sometimes originate in unexpected contexts, making it difficult for the focal firm to identify them, which leads to that attraction can inform a firm about solutions that it otherwise would have overlooked. Notably, this aspect of how external actors solve existing problems is related to the findings of Jeppesen & Lakhani (2010), who show that firms, through *broadcast search*, can solve previously intractable problems by revealing them to (and soliciting solutions from) a large and diverse pool of external scientists and researchers. The difference between the type of examples de-

---

<sup>143</sup> In addition, although there is a clear limit as to how many impulses with high new knowledge content a firm can adopt (because the subsequent development process is so resource-intensive), a firm like Ericsson Multimedia can adopt a large number of additional mobile services. Likewise, DeLaval can easily add a large number of products based on external ideas to its aftermarket product portfolio.

## Chapter 7

scribed in this section and Jeppesen & Lakhani's findings is that in the cases described here, the solutions entered the recipient firms on *an unsolicited basis* and hence included no externally oriented activities undertaken by the recipient firms.

★ ★ ★

Altogether, the findings of the previous sections show that impulses that are aligned with the recipient firm's existing knowledge base can be of value to the firm by supporting its incremental innovation, as they may provide it with additions to current product areas or puzzle pieces that contribute to solving R&D problems that had hampered the development of new products. The inflow of this type of impulses, further, assumes importance as they can be adopted in relatively large number since the adoption process is relatively uncomplicated and not highly resource-intensive.

### **Summary of the effects of the impulses that are adopted**

Based on the analysis set forth in previous sections, it can be concluded that the adoption of both types of impulses (high and low degree of novelty and alignment with the recipient firm's knowledge base) can bring important benefits to firms, but that each type is also constrained by its own set of limitations. The adoption of impulses with high new knowledge content has the potential to trigger *radical innovation* through the creation of new product areas and the introduction of new technologies to existing product areas. At the same time, the adoption of these impulses can be hampered by a lack of compatibility making the adoption and adaptation process *resource-demanding and time-consuming*, which means that firms can only adopt a limited number of such impulses.

In addition, because these impulses diverge significantly from the existing products, technologies, or dominant logics within the recipient firm, they also tend to be met with more *internal resistance*, which makes them more likely to be rejected. On the other hand, impulses that bring a low degree of new knowledge and are consistent with the products, technologies, and dominant logics of the recipient firm are unlikely to have a substantial impact of the firm's corporate strategy or technological base on an individual basis, but also are *more likely to be adopted* and can be adopted in greater number,

### *Attraction: A new driver of learning and innovation*

which means that *the aggregate effects of these types of impulses can be substantial.*

#### **7.1.3 Indirect innovation and learning**

A finding that has emerged from the case analyses is that firms can benefit not only from those external impulses that they choose ultimately to adopt, but also through exposure to the pool of ideas and inventions that are not adopted. After having outlined how firms are affected by the impulses that they choose to adopt in the previous section, in this section I analyze *the indirect effects* of attracting external impulses by outlining how and why the case companies can also benefit from the pool of external impulses that are not adopted.

#### **Involuntary knowledge transfer and learning**

The primary reason that recipient firms benefit from impulses that are not adopted is that during the meetings between the recipient firms and the impulse providers, a certain *knowledge transfer* inevitably takes place as the impulse provider presents the idea or invention to the recipient firm. In effect, because ideas or inventions typically cannot be presented without the disclosure of a certain amount of information about the idea or invention, the meetings between the managers of the recipient firms and the impulse providers are in themselves a source of information and knowledge for the recipient firms, whether the impulse is adopted or not. From the perspective of the impulse provider, this knowledge transfer is typically *involuntary*, but also difficult to avoid, because in order to trigger the interest of the recipient firm, a certain amount of information about the idea or invention needs to be disclosed (cf. Zander 1991).

Significantly, this means that these meetings with impulse providers constitute *learning opportunities* for the managers of the recipient firms. Specifically, the findings suggest that impulse providers often have specialized expertise in a specific technology or market niche from which the recipient firms can learn during the meetings, even if the specific idea or invention that is presented is of limited interest. A quote from a long-time telecom entrepreneur and CEO of a mobile services company (name withheld) illustrates these findings:

“It is very common for small companies to come and pitch ideas to the large companies. The managers of the large companies, they listen and they ask questions, detailed questions. The small companies know the



## Chapter 7

niches in the market, and in this way, they educate the large companies about where the market is going. The proportion of all of these meetings that result in deals is, however, very small.”

The beneficial role that such meetings play as learning opportunities is also emphasized by the managers of the case companies. The statements in Table 7.1 illustrate some of the learning-related benefits that can be gained by engaging in meetings with external actors who present new ideas and inventions.

**Table 7.1 Learning from meeting with the impulse providers**

Company	Quote
Autoliv	“It’s always useful to discuss new ideas. It stimulates your own thinking. I’m a firm believer in lots of communication in the product development process.” (Sture Andersson, former Vice president of Engineering, Autoliv)
DeLaval	“If there is something that has been done differently, you want to know how it works. Even if it doesn’t work in the end, you can still learn something from it.” (Torbjörn Pettersson, Senior Milk Extraction Specialist, DeLaval)
Ericsson Multimedia	“It’s the lifeblood of the company to maintain a connection with other small, medium-sized, and large companies and to have lots of discussions with them in order to help the company continue to develop.” (Jørgen Odgaard, former Director of Ericsson Developer Connection)

The significant aspect of the interaction with impulse providers as a learning mechanism is that the managers of the recipient firms become exposed through these meetings to a great diversity of new perspectives (Page 2007) that are shaped by a *different set of competencies* (Prahalad & Hamel 1990), *technologies* (Patel & Pavitt 1997), *knowledge structures* (Walsh 1995), *routines* (Becker 2004), and *ambitions* (Cyert & March 1963) than those that dominate within the recipient firms. The case analyses suggest that such interaction with a diverse group of actors tends to create learning effects on multiple levels of abstraction. First, it may contribute to solving specific technological problems within the recipient firm; in effect, even though an external impulse in itself does not offer the ultimate solution to a certain problem, it may inspire the managers and engineers of the recipient firm to solve the problem by *redirecting their own search* for a solution into a new direction that ultimately allows them to solve the problem. This role of external impulses as catalysts that trigger the recipient firm to solve an existing problem is emphasized by Torbjörn

*Attraction: A new driver of learning and innovation*

Petterson, Senior Milk Extraction Specialist at DeLaval, who states that:

“Sometimes a problem remains unsolved until someone from the outside comes with a new idea and stimulates you to re-open the case and ultimately to solve the problem.”

Second, in addition to these concrete learning effects related to specific problems, the case findings suggest that the continuous interaction with actors who hold different perspectives also has a number of abstract, higher-level effects, as it *contributes to updating, extending, and refining the knowledge structures* of the managers within the recipient firms.

The importance of well-developed and accurate knowledge structures and cognitive representations of the competitive environment has been demonstrated in previous studies, such as Gavetti & Levinthal (2000) and Gavetti & Rivkin (2007). These researchers emphasize the relationship between accurate and sophisticated cognitive representations of industry dynamics and a firm’s ability to make sound strategic decisions. The current study finds that the interactions with a broad range of actors undertaken by the managers of recipient firms as a result of attracting external impulses represents an important, and partly unique, mechanism through which such cognitive adaptation occurs. In effect, the analysis suggests that the interaction with multiple impulse providers allows the managers of the recipient firms to gain a more sophisticated and comprehensive understanding of the market dynamics and the technological development of their industries, which in turn tends to make these managers better equipped to make decisions about which technologies to invest in, which products to develop for the future, and which customer groups to target.

Significantly, the unique aspect of this attraction-induced learning, one which distinguishes it from other mechanisms through which managers learn and refine their knowledge structures, is that it is *the external actors who initiate the contacts*. This means that the selection of the “discussion partners” occurs, to some extent, *independently* of the focal firm’s existing networks and routines for acquiring information and new perspectives on the industry. The fact that it is the external actors who self-select to interact with the focal firm and act to initiate the contact seems to represent a safeguard

## Chapter 7

against the risk that the focal firm will interact only with actors that have similar perspectives on the industry (cf. McPherson et al. 2001). Consequently, the study suggests that attraction-induced interaction with external impulse providers represents a mechanism that *counters the development of overly homogenous knowledge structures* among managers within a firm.

### **Consolidating information and combining unconnected knowledge**

A further consequence of attracting a broad range of external impulses and interacting with a diverse pool of impulse providers is that it enables recipient firms *to connect and combine previously dispersed information and knowledge* and to act as *knowledge brokers* (Hargadon & Sutton 1997, Hargadon 1998, Burt 1992, 2004). The case findings suggest that attractive firms constitute nexuses to (and through) which many different ideas and inventions developed by a diverse group of external actors are channeled. The case study of DeLaval, for instance, shows that the company's worldwide distribution system, without which it is difficult to commercialize new products in the dairy farm industry, allows DeLaval to attract a wide variety of external impulses. Similarly, Autoliv's status as a first-tier supplier to the major car companies means that a large share of all new ideas related to car safety systems are channeled to Autoliv. Significantly, the findings further suggest that the external impulse providers typically do *not* interact with one another, which means that the case companies, to whom impulse providers often choose to present their new ideas and inventions, gain access to a unique combination of information, ideas, inventions, and perspectives that taken together provide a unique overview of the industry. Telecom entrepreneur Niklas Sjöberg, CEO of Mozoomi, argues that:

“The large companies consolidate the picture and drive innovation on a larger scale. Because so many entrepreneurs come to pitch ideas, the companies get the opportunity to put together all the small puzzle pieces and see the bigger picture and how it all fits together.”

In other words, Sjöberg suggests that for the recipient firms, it is not the individual impulses that the company attracts that are important. Instead, it is the *possibility of combining, aggregating and synthesizing the information inherent in all of the impulses* that is truly valuable (cf. Kogut & Zander 1992). This implies that although each impulse

### *Attraction: A new driver of learning and innovation*

in isolation may possess only modest value for the firm, in combination, they may be highly valuable, as they all constitute pieces in a larger puzzle that the recipient firms try to put together.

★ ★ ★

In sum, this finding tentatively suggests that highly attractive firms that receive impulses from a diverse group of external actors are in a *unique position to sense and identify changes in their industry*, which ultimately can be translated into a *heightened ability to discern and act on opportunities and threats*. Importantly, such a capacity to synthesize disparate pieces of information and translate them into new opportunities is identified by Teece (2007) as a fundamental building block of a firm's *dynamic capability*, which ultimately determines the firm's prospects of renewing the basis of its competitive advantage. This, in turn, suggests that the propensity to attract a substantial and diverse inflow of external impulses constitutes a potential determinant of a firm's *ability to renew the basis of its competitive advantage*.

#### **7.1.4 Conclusions of how firms are affected by attraction**

Based on the analysis set forth in the previous sections, pertaining to the different ways in which the case companies are influenced by attracting external ideas and inventions, a set of preliminary conclusions can be formulated at this stage. First, it is obvious that when evaluating how a firm is influenced by attracting an inflow of external ideas and inventions, it is crucial to study not only those impulses that get adopted, but also those that are *rejected*. Even impulses that are not adopted may provide *indirect benefits*, as they can convey important information that may contribute to learning and stimulate the recipient firm in its innovation efforts.

Second, the analysis strongly underscores the importance of not assessing the effects of each external impulse in isolation from other external impulses. The analysis suggests that the most significant benefits that recipient firms can draw from the inflow of external impulses that they attract may derive from the possibility of *combining* external impulses and *aggregating* the information inherent in the individual impulses. This in turn is found to be valuable for the recipient firms, as it puts them in a favorable position to be able to *sense*

## Chapter 7

*changes and trends in the industry* related to emerging opportunities and threats that other actors that do not attract as many external impulses cannot as readily identify (Makadok & Barney 2001, Denrell et al. 2003, Teece 2007), which ultimately strengthens the recipient firms' abilities to make *informed and accurate strategic decisions*.

Third, the analysis highlights the multiple levels at which the inflow of external impulses can influence the recipient firms. On the most basic level, attraction supports *product-level innovation* by adding new products to the recipient firms' current product areas or by contributing to the improvement of existing products. This type of product-level effect is typified by the attraction processes that are related to DeLaval's aftermarket product category, in which external product ideas contribute to extending the company's product portfolio within the confines of the existing product area. Notably, the external product ideas that are adopted are typically aligned with the company's existing product portfolio and its existing ways of thinking, which means that they do not lead to higher-level learning in terms of stimulating changes in DeLaval's corporate strategy.

In addition to these product-level effects, the analysis also demonstrates that attraction provides firms with externally developed initiatives that have *more far-reaching implications* in terms of influencing and challenging the recipient firm's *corporate strategy*. This scenario is exemplified by the way Tony Fadell's vision of a new business model in music based on a handheld digital music player and a proprietary downloading service triggered the development of the iPod and the iTunes Store within Apple. Notably, in this case, the initiative deviated from the recipient firm's existing product portfolio and its current corporate strategy, as Apple was not active in the digital music industry at the time that the company was approached by Fadell. This means that the adoption of Fadell's ideas not only added a new product but also in fact led the company into a new industry and triggered *a significant re-orientation of Apple's corporate strategy*.

Besides the effects of attraction that are directly related to the adoption of a specific product and/or service, the analysis suggests that attraction can support the recipient firms' *higher-level learning* as the study shows that attracting a diverse pool of ideas and inventions contributes to *developing and refining the knowledge structures* of the managers of the recipient firms with respect to their understanding of how their industries are evolving in terms of the technological development, changes in consumer behaviors, or other

significant factors that contribute to shaping industries' future trajectories (Barr et al. 1992).

★ ★ ★

Finally, after having outlined the different ways in which attraction influences firms, it is important to note that some of the effects of attraction that were identified in the previous sections, such as providing firms with ideas for new products and enabling them to learn about their competitive environment are not exclusive to attraction, but can also be achieved through search-based activities such as environmental scanning or internal innovation. This points to a remaining need to address the question of what is unique about attraction, which also corresponds to the study's final research question, which asks *how attraction differs from search*. Consequently, in the following section, the concepts of attraction and search will be compared against one another in order to identify how attraction differs from search, and ultimately to outline what is distinctly unique about attraction in terms of how it influences learning, innovation, and strategy creation in firms.

## **7.2 How attraction differs from search – Research question 4**

The findings of the study hence show that search and attraction together provide firms with the raw material, in the form of new ideas and inventions, for the creation of new products and strategies. Notably, on the level of the individual idea or invention, search and attraction may at times produce similar outcomes, in the sense that an idea may emerge inside a focal firm at the same time that a similar idea is conceived of outside of the firm by an external actor who thereafter approaches the focal firm to present the idea. Importantly, however, the analysis has identified *significant and systematic differences* between attraction and search at the level of the respective *populations of ideas and inventions* that attraction and search produce. In response to these population-level differences, the ways in which attraction and search contribute to the development of new products and strategies will be outlined and compared in this section, focusing specifically on how they differ in terms of *the functions that they perform*, and their respective *strengths and weaknesses*.

### 7.2.1 Differences between attraction and search

The fundamental difference between attraction and search is that a firm's own search is based on its internal cognitions, capabilities, and routines, whereas the pool of ideas, inventions, and opportunities that a firm attracts is based on *external actors' cognitions, capabilities, technologies, and routines*. An additional difference is that search is based on the focal firm's own goals and objectives, whereas attraction is based on the goals and objectives of external actors, which has the implication that search requires an element of *motivation* on the part of the focal firm, whereas attraction does not, in the sense that a firm may attract external impulses even when it is passive and has no motivation to search for new ideas or inventions.

#### Attraction and search are subject to different limitations

These differences have significant implications, as they imply that the pools of ideas and inventions that firms attract are *not limited by the same factors that impose restrictions upon internally initiated search processes*. As outlined in earlier chapters, previous literature has established that all activities initiated by a focal firm, including those that are of a dynamic nature and are aimed at creating novelty, such as product development, environmental scanning, technology scouting, and business development, tend to be subject to certain limitations (Teece et al. 1997, Ahuja & Katila 2004, Teece 2007).

More specifically, established knowledge structures contain core assumptions and ways of thinking that are taken for granted and which often go unchallenged (Prahalad & Bettis 1986, Lyles & Schwenk 1992, Walsh 1995); firms' existing technologies subject them to path dependencies that constrain the trajectories along which firms develop their technologies over time (Dosi 1982, Patel & Pavitt 1997); and established routines and practices for innovation and information acquisition shape the outcomes of these activities in accordance with what has led to success in the past and what is in line with existing ways of operating (Nelson & Winter 1982, Miller 1994).

Although no firms are completely homogenous, as they are constituted by different people, organizational units, and functions, this results in a situation in which search that is carried out by a firm tends to be influenced by certain shared ideas and established ways of acting, which in turn shapes what new ideas, inventions, and op-

*Attraction: A new driver of learning and innovation*

portunities are identified or created. This implies that *the scope of a firm's search tends to be limited*, and that most of its attentions and the majority of its search efforts will be focused on a certain sector of "the opportunity landscape" that it faces, as the opportunities and solutions that are consistent with the shared ways of thinking and acting within the firm are more likely to be identified than are those that contradict these prevailing logics. This can also be expressed by saying that the search that is conducted by a firm is conducted from a certain *idiosyncratic vantage point*, defined by the cognitions, capabilities, technologies, and routines that dominate within the firm, which facilitates the identification of certain opportunities, but also prevents the firm from identifying other opportunities (Denrell et al. 2003 Ahuja & Katila 2004).

The core insight of this study is that the external ideas and inventions that a firm attracts are *not subject to the same limitations*. Instead, each idea or invention that a firm attracts is based on the cognitions, capabilities, technologies, and routines of that particular impulse provider, which means that the inflow of external impulses is based on *a multitude of perspectives* (cf. Page 2007). Notably, each of these actors (and consequently the impulses that they provide) are subject to their own idiosyncratic biases and limitations (Ahuja & Katila 2004), but what is important for the focal firm is that all of these *differ from the focal firm's own biases and limitations* (cf. Jeppesen & Lakhani 2010).<sup>144</sup> This means that whereas search is associated with the identification of new opportunities from a relatively *homogenous vantage point*, attraction, on the other hand, is associated with the recognition of opportunities from *multiple vantage points*. As such, there tends to be *greater diversity and variation* in the pool of ideas, inventions, and opportunities that firms attract compared to those that they identify or create through their own search, which is illustrated by the quotes in Table 7.2.

---

<sup>144</sup> Importantly, this is not intended to imply that there are no similarities in terms of cognitions, routines, and technologies among different actors. It is acknowledged here that there may exist certain *industry recipes* (Spender 1989) and *technological trajectories* (Dose 1982), which contribute to making firms within the same industry more similar over time, but it is still argued in accordance with Nelson (1991) that all firms have idiosyncratic features that distinguish them from each other.



## Chapter 7

**Table 7.2 Attraction as a source of diversity and variation**

Company	Quote
Autoliv	"The ideas that come from the outside are more diverse. There are plenty of ideas that lie outside of what we normally do, but which still find their way to us." (Jan Olsson, Vice President of Research, Autoliv)
DeLaval	"They can come from anywhere. Last week I had a meeting with a company that produces work clothes. Another meeting was with a company that works with fresh water tanks on ships that had an idea about how their product could be applied in agriculture. They contacted us." (Göran Karlsson, Director of Product Portfolio Barn Equipment and Farm Supply)  "The radical innovations, the real bestsellers, often cannot come about through normal R&D processes in large companies. You can only hope for incremental innovation. The really big ideas come from smaller companies, and to succeed, they often have to penetrate the larger companies, since they can't make it on their own." (Uzi Birk, Senior Technical Director of R&I DeLaval)
Ericsson Multimedia	"Most of the idea generation takes place at the entrepreneurial level, especially when it comes to the end users, end-user behavior, and all types of services or applications that are related to this." (Niklas Sjöberg, CEO Mozoomi)

★ ★ ★

Significantly, the analysis demonstrates that the higher degree of diversity and variation that is associated with attraction, and the underlying difference between the processes that undergird search and attraction mean that they have *different sets of strengths and weaknesses*, and that they tend to influence firms in different ways; differences that are delineated and analyzed in the following section.

### 7.2.2 Relative strengths of attraction and search

Katila & Ahuja (2002) distinguish between *the depth* and *the scope* of a firm's search for new products, where 'depth' refers to the extent to which firms *re-visit and re-combine their existing knowledge*, and where 'scope' refers to the degree to which firms *explore new knowledge in order to create new products*. Even though they were developed for a slightly different purpose, the case analysis suggests that these two dimensions are also useful to assess the relative merits of search and attraction, with respect to how they contribute to firms' learning and exploration of new product ideas.

**Attraction expands the scope of a firm's knowledge base**

As shown by Table 7.3, the analysis demonstrates that attraction is relatively better suited to *extending the scope of a firm's knowledge*, whereas search is relatively better suited to *deepening the firm's knowledge in its existing areas of expertise*. This pattern that attraction has a relative advantage with respect to extending the scope of a firm's knowledge, whereas search has an advantage in terms of increasing the depth of a firm's knowledge, has emerged consistently throughout the analysis of empirical data and is exemplified by the Autoliv, the DeLaval, and the Ericsson Multimedia cases.

These studies show that attraction has a *marginal influence in deepening the companies' knowledge in their existing core areas*, as the impulse providers typically fail to compete with the internally produced knowledge, whereas attraction contributes substantially to broadening *the scope* of their knowledge base. Significantly, this pattern is manifested both with respect to firms' products and their technologies. The case findings reveal that whereas external impulses rarely help firms to improve their existing core products, they frequently contribute to extending the scope of the firms' product portfolios by informing them about ideas for new types of products.

Likewise, the case findings demonstrate that the attraction of external impulses rarely contributes to improving and deepening firms' knowledge in their core technologies, such as, for instance, milk extraction technology in the case of DeLaval or seatbelts and airbags in the case of Autoliv; rather, attraction can broaden a firm's technological base by providing it with novel technologies that lie outside of its own core technologies. This pattern is exemplified by how ChemoMettec's inventions, which undergirded the development of the DeLaval Cell Counter, allowed DeLaval to broaden its technological base to also include technologies for milk analysis, a domain within which it previously lacked technological capability. On a general level, this suggests that attraction has a relative benefit with respect to informing firms about technological innovations that fall *outside* of their current technological trajectory, whereas search is relatively more useful with respect to technological innovation that falls *within* a firm's existing technological trajectory (Dosi 1982, Patel & Pavitt 1997).

★ ★ ★

## Chapter 7

Altogether, the analysis suggests that the reason for the superiority of search in improving the depth of a firm's knowledge is that the focal firm can take its existing knowledge and the outcomes of previous searches as *the starting points for new searches*, and thereby in a cumulative way can build on the existing knowledge that has been amassed within the organization. The fact that a firm's own searches can draw upon the firm's existing knowledge base tends to increase the chances that these searches refine and deepen the firm's knowledge in its existing areas of expertise. However, the other side of the coin is that this process introduces an element of *path dependency* to the firms' learning, which narrows the boundaries of a firm's learning and puts a limit on the extent to which internally initiated search processes can extend the scope of the firm's knowledge.

External impulses that a firm attracts, on the other hand, tend to be created more *independently* of the focal firm's existing knowledge base and its previous searches, as the external actors typically do not have access to its existing knowledge base. The fact that the external initiatives are built not on the existing "state-of-the-art" knowledge within the focal firm, but rather on *the impulse provider's own knowledge* means that whereas they are unlikely to deepen the focal firm's knowledge, they are, on the other hand, more likely to introduce it to new knowledge elements that widen the scope of its knowledge (Rosenkopf & Nerkar 2001).

**Table 7.3 Differences between search and attraction**

	<i>Search</i>	<i>Attraction</i>
Determinants of the outcome	Routines, cognitions, capabilities, and ambitions of the focal firm	External actors' routines, cognitions, capabilities, and ambitions
Vantage point	Relatively homogenous	Multiple and heterogeneous
Relative strength	Depth of the knowledge base	Scope of the knowledge base
Relative weakness	Lack of novelty and variation (myopia, simplicity)	Lack of relevance and compatibility
Primary type of innovation	Incremental	Radical
Type of opportunities	Related to existing product areas and existing uses of resources and capabilities	Related to new product areas and new uses of resources and capabilities

### **Attraction supports radical innovation**

Importantly, these differences in terms of the processes that undergird attraction and search have significant implications for the extent to which they can support *radical or incremental innovation*, respectively (Henderson & Clark 1990). The findings suggest that because external impulse providers cannot to the same extent draw upon the focal firm's existing knowledge base and its previous innovation, their ideas and inventions tend to be more radical in relation to the focal firm's existing products and technologies, and thereby relatively more likely than the focal firm's own search to *instigate radical innovation* in terms of triggering the creation of entirely new products and the introduction of new technologies (Dewar & Dutton 1986, Ahuja & Lampert 2001). Conversely, the findings suggest that since the firm's own innovation search tends to build and draw upon its existing knowledge base and previous innovation efforts, it is relatively more likely to result in incremental innovation that improves existing products and technologies (Dougherty & Hardy 1996).

However, having outlined these differences, it is important to again stress that this does not imply that search cannot produce radical innovation or that attraction cannot produce incremental innovation, but rather that attraction has a *relative* advantage in promoting radical innovation and that search has a *relative* advantage in driving incremental innovation.

### **7.2.3 Relative weaknesses of attraction and search**

The differences between attraction and search are also reflected in the fact that they are subject to different weaknesses and limitations. The problems associated with search have been outlined in the extant literature and have been reviewed at some length in previous chapters. In sum, the literature demonstrates that the potential problems or deficiencies of firms' own search processes center on their tendency to become overly restricted by existing routines, cognitions, and technologies and as such, to create *too little novelty and too little variation*. This can in turn lead to innovation that is overly incremental and that firms overlook valuable opportunities because they diverge from their existing product portfolios, technologies, or ways of operating, which ultimately can make firms vulnerable to environmental changes that render their existing products, technologies or ways of operating obsolete (Miller 1993, Levinthal & March 1993).

## Chapter 7

The problems associated with the ideas and inventions that firms attract are, however, generally of a different nature. Because these ideas typically originate among a diverse group of external actors, they tend to display *significant variation* and be more *independent* of the recipient firm's existing product portfolio, technologies, cognitions, and routines, and therefore contain significant novelty for the recipient firm. The main problem associated with the attraction-based input is instead a common *lack of relevance and compatibility*. In effect, because the impulses that firms attract have emerged outside the focal firm, the actors behind the impulses may lack an understanding of the specific conditions under which the focal firm operates, and as such, the proposed impulse and the recipient firm are not compatible.

Such problems associated with compatibility may be technological in the sense that the technology upon which an attracted impulse is built diverges from the technological trajectory of the focal firm, rendering the adoption of the impulse problematic. Other problems may be related to the recipient firm's existing business models, with which the external impulse has a poor fit. As a consequence, the case findings demonstrate that attraction is *a more unreliable and variable process* than search, in the sense that the proportion of ideas and inventions that get implemented typically is lower than for the ideas and inventions that result from the firm's own search processes, even though the external ideas often have greater potential because they contain a significant degree of novelty for the recipient firm.

### 7.2.4 Summary of the differences between search and attraction

In sum, this discussion suggests that attraction has its primary strength in creating *variation*, and in broadening *the scope of a firm's "vision" and its knowledge base*, which in turn contributes to informing the firm about opportunities that it otherwise would have overlooked because of limitations that dictate its manner of searching. Notably, these benefits occur because the external impulses that a firm attracts originate with multiple external actors who observe the focal firm and the external environment from several *different vantage points* (Denrell et al. 2003). The disadvantage of attraction, on the other hand, is that a large share of all external impulses is not relevant to the recipient firms because they are not compatible with their existing technologies, competencies, and mindsets, which leads to

*Attraction: A new driver of learning and innovation*

that the success rate of attraction is relatively low compared to search.

In the terminology of a *performance landscape*, this can be expressed by saying that the primary benefit of attraction is that it gives the recipient firms the possibility of conducting a *broader examination* of the performance landscape, as it tends to point to possible “long jumps” to new peaks in the landscape that the focal firm has not yet identified or explored (Levinthal 1997, Gavetti & Levinthal 2000). However, because such long jumps tend to be risky, a smaller number of all the external impulses that firms attract are ultimately adopted by the recipient firms. On the other hand, the impulses that are adopted can create benefits for firms in terms of radical innovation and growth into new product areas. Conversely, the case analysis suggests that attraction is relatively limited, compared to internally initiated search, in its ability to offer feasible ways in which the recipient firms can improve their position in the performance landscape by incrementally reaching higher on the peak that the recipient firm is already climbing. Concretely, this means that attraction is relatively more effective with respect to radical innovation and informing firms about opportunities related to new product areas and new technologies, whereas search has a relative advantage with respect to incremental innovation and identifying opportunities within existing product areas and technologies.

Importantly, it should be noted at this stage that both types of learning and innovation, i.e., the exploration-related benefits associated with attraction and the exploitation-related benefits associated with search, are equally important in the sense that both are needed in order to ensure a firm’s short- and long-term survival and success (March 1991). In other words, the analysis of the previous section should *not* be understood as that attraction, because of its broader scope, is more valuable than search, but merely that attraction has a relative advantage in helping firms explore new sources of advantage whereas search has relative advantage in helping firms exploit their existing advantages.

### 7.3 Benefits enjoyed by attractive firms

After having analyzed how attraction and search differ in terms of their strengths and weaknesses, the following section will outline some of the unique aspects of attraction by presenting the conclusions about how an attractive firm's potential for learning, innovation, and strategy creation differs from firms that do not attract external impulses and hence have to rely only on their own search. The following section is divided into three parts, since the analysis suggests that highly attractive firms primarily enjoy three types of advantages compared to less attractive firms, namely, that attraction (i) *enables them to more broadly explore the opportunity landscape that they face*, (ii) *allows them to economize on their exploration-related costs*, and (iii) *puts them in a better position to make informed and accurate strategic decisions*; each of which is discussed below.

#### 7.3.1 Attraction enables broader exploration

The first and foremost benefit that attractive firms enjoy compared to firms that do not attract externally developed ideas and inventions is that they tend to be in a better position to broadly explore the opportunity landscape that they face. The reason for this is, as outlined in previous sections, that whereas search is based on exploration from a relatively homogenous vantage point (inside the firm that conducts the search), attraction is based on exploration from *multiple vantage points* (the vantage points of a multitude of impulse providers). By getting exposed to the exploration of multiple impulse providers who each explore from their idiosyncratic vantage point, attractive firms get access to *a broader set of ideas and inventions* than that which they could have achieved if they had been less attractive and would have had to rely only on their own search.

#### 'Unknown unknowns'

With respect to the finding that attraction enables broader exploration of new opportunities than search, the study suggests, more specifically, that attraction plays a particularly important role for firms by informing them about so-called *unknown unknowns*, which are things that firms could potentially benefit from, but the existence of which they are unaware (and hence do not know that they are missing). The reason why attraction is particularly important with respect

*Attraction: A new driver of learning and innovation*

to such unknown unknowns is that search is subject to the fundamental limitation that it requires the searching firm to have a certain understanding of what it is that it is missing and hence to have an understanding of what it should be searching for (Becker 2001), which implies that firms are limited to searching for things that lie *within the scope of their imagination*. Importantly, however, this restriction does not apply to attraction, since the fact that attraction is not based on the focal firm's own knowledge or imagination means that attraction can inform a focal firm about ideas, inventions, and opportunities that it previously did not know existed, and hence provide it with new opportunities that reach *beyond the firm's collective imagination*.

The case studies point to multiple instances in which a recipient firm attracted ideas and opportunities that lay beyond the scope of its imagination and that the firm, therefore, did not know what it was missing. For instance, the notion of on-farm milk analysis had not occurred to DeLaval at the time that the idea was presented to the company by ChemoMetec. Consequently, as a result of its failure to imagine such a product, the company also had not engaged in any search activities related to on-farm milk analysis. Likewise, the concept of FM synthesis, which would prove instrumental for Yamaha's development of the digital synthesizer, was unknown to the company at the time that Yamaha was presented with this concept by the Stanford Office of Technology Licensing. Notably, at this time, Yamaha was already engaged in intense search for solutions that would enable the company to develop a digital synthesizer, but because the company essentially did not know what to look for, it failed to identify FM synthesis through its own search.

★ ★ ★

In sum, this discussion points to a general conclusion about the relative benefits of search and attraction with respect to the broad exploration of new opportunities, namely, that search is relatively more effective with respect to exploring things that *the firm knows that it is lacking*, i.e., *known unknowns*, whereas attraction, on the other hand, is relatively more effective with respect to informing firms about the previously mentioned *unknown unknowns*, i.e., things that would be useful and valuable to the firm but of which it is unaware and hence does not know that it is lacking.



**Attraction is not dependent of the focal firm's motivation**

In addition to informing firms about things that they did not know they were missing, a unique feature of attraction that allows it to contribute to broadening the scope of their exploration is that it is *not dependent on the motivation of the focal firm*. In contrast to search, which is dependent on whether the focal firm is motivated to engage in search, the attraction mechanism can inform a firm about new ideas, inventions, and opportunities even at times when the firm itself lacks the motivation to search. Further, attraction can inform the firm about opportunities in technological areas or product areas in which it has theretofore refrained from searching.<sup>145</sup>

Given the depiction in the extant literature of search as being *motivational*, in the sense that it is typically triggered by concrete problems or a discrepancy between current performance and the firm's aspiration level (Cyert & March 1963), there is reason to believe that most firms, due to a lack of motivation to engage in search, have overlooked certain opportunities and solutions that are better than the ones that are currently used. This suggests that the fact that attraction is not bound by the focal firm's own motivation indeed can be important for firms as it represents a mechanism through which they become informed about new opportunities and more optimal solutions that they would otherwise have overlooked. It can hence be concluded that the fact that attraction informs firms about new ideas and inventions in areas that they themselves have chosen not to search thus grants firms access to a larger pool of ideas and inventions around which to innovate and from which to select their future products, technologies, and strategies compared to what they would have had access to using only their own search.

★ ★ ★

In sum, this increased scope of exploration upon which attractive firms can draw creates two main benefits that are not available to firms that have to rely on only search-based exploration. First, it in-

---

<sup>145</sup> Notably, such decisions by a focal firm to refrain from investigating a certain area may reflect an element of "laziness" on the part of the focal firm, but they may also reflect an assessment that additional search within the area has a *negative net present value* because the anticipated benefits do not offset the costs associated with increased search efforts (Denrell et al. 2003).

### *Attraction: A new driver of learning and innovation*

creases the focal firm's chances of *identifying new opportunities* to grow into new product areas or to use new technologies in its existing product areas. Attractive firms, in other words, get *a more complete picture of the opportunity landscape* that they face than do firms that have to rely only on their own search (Makadok & Barney 2001, Denrell et al. 2003).

Second, the fact that attractive firms get "pushed" into encountering a wider range of perspectives as a result of external actors presenting ideas that are based on their idiosyncratic vantage points tends to decrease the risk that they will fall into various types of *learning traps* (Levinthal & March 1993, Miller 1994). Specifically, the analysis suggests that the broader scope of exploration that is enabled by attraction lowers the probability that a firm will become *myopic* and will fail to notice important changes in its environment that require the firm to adapt (Levinthal & March 1993, Miller 1994). Likewise, it indicates that the increased variation that an attractive firm becomes exposed to decreases the risk that it will become overly simplistic in its ways of collecting information and intelligence (Miller 1994).

Importantly, however, these findings do *not* imply that attraction can provide a complete antidote to these common problems; instead, they merely suggest that a continuous exposure to perspectives that contradict the focal firm's own ways of thinking and acting typically serves to *alleviate these problems and lowers the risk* that a firm will fall victim to the various learning traps. The extent to which firms can enjoy the benefits of attraction is, also dependent on the extent to which it chooses to pay attention to the impulses it attracts. If a firm neglects these impulses as a result of overconfidence or other factors (Miller 1993, Kroll et al. 2000), it will enjoy none of the benefits of attraction and will be as susceptible to learning traps as less attractive firms.

#### **7.3.2 Attraction as a low-cost substitute for search-based exploration**

The arguments set forth in the previous section related to how attraction can inform also *passive firms* about new opportunities in their environment point to a further property of attraction that sets it apart from search, namely that attraction, unlike search, *does not necessarily entail any costs or efforts on the part of the recipient firm*, as it is the impulse providers that identify the opportunities and initiate the

## Chapter 7

contact with the recipient firm. This means that attraction represents a more *economical* way of becoming informed about new opportunities than search (Williamson 1991).

This economizing aspect of attraction is potentially important, as it is known from previous studies that exploration is *costly* and that firms that engage in a great deal of exploration appear less efficient at a given point in time than firms that refrain from exploration and instead focus on exploiting their existing advantages (March 1991). In effect, if a firm wants to engage in broad exploration of new technological fields or product areas, it typically needs to dedicate substantial resources to activities such as R&D and technology scouting, and possibly also to allow a certain amount of *slack and experimentation* within the organization by, for instance, setting up so-called 'skunk-works projects' that are dedicated to pursuing endeavors that lie outside of the firm's mainstream innovation efforts.

In addition, a typical feature of such exploration-inducing activities is that only a fraction of all new projects ever actually materialize and lead to viable new products or technologies, which makes them costly, as a significant proportion of the experimentation that is undertaken does not lead to any tangible results. A important difference between firms that are attractive to external innovators and firms that have to rely only on their own search is that the latter need to *bear the full cost of potentially beneficial exploration*, whereas the former can enjoy some of the benefits of other actors' exploration *without having to bear their full costs*. In effect, in those instances where a firm attracts external impulses, the impulse providers have developed the ideas and initiated the contact with recipient firm, which means that they have borne all the costs up to that point. At that stage, the recipient firm can choose which of the impulses to adopt and pay for, as it can simply reject those in which it is not interested without paying anything for them. This means that the recipient firm only needs to pay for the ideas or inventions that it actually adopts and can benefit from, whereas the costs for the impulses that they reject must be fully borne by the impulse providers. In contrast, in its search-based exploration, the focal firm must to a greater extent bear the costs for the failed efforts that it chooses not to pursue. In sum, this means that attraction, from the perspective of the focal firm, represents a cheaper exploration mechanism compared to those that are based on the firm's own search.

*Attraction: A new driver of learning and innovation*

In terms of the empirical findings pertaining to this aspect of attraction and search, the case analyses reveal that firms that are sufficiently attractive typically can economize on the cost and effort they invest in search activities, such as environmental scanning and technology scouting, compared to the funds they would have to spend if they were less attractive. This finding, namely, that highly attractive firms can afford to devote fewer resources to scanning the environment for potential innovation partners, is illustrated by the following statement by Torbjörn Nilsson, former Senior Vice President of Strategy at Ericsson:

“Typically, we don’t have to worry, because these companies usually come to Ericsson pretty quickly, wanting to promote themselves in different ways, so there is little risk that we will miss them.”

On a similar note, Fredrik Backner, who is Director of Mobility at one of Ericsson Multimedia’s largest customers, TeliaSonera, argues that:

“We don’t have to search for them – they come to us anyway. If someone has an idea, then they go to the operators.”

In sum, the case analysis hence suggests that attraction to some extent can offer *a substitute for search*, and that attraction enables firms to economize on the costs that they have to incur for exploration.

★ ★ ★

After having argued that attraction represents a cheaper exploration mechanism than search, it is, however, important to emphasize a number of caveats pertaining to this finding. First, it should be noted that there are also certain costs associated with attraction. In effect, attracting a large number of ideas and inventions requires the recipient firm to devote resources to the handling and evaluation of the ideas and inventions. This consumes managerial resources and can also lead to costs associated with the building of an IT infrastructure for the reception of external impulses, such as the one that P&G has constructed. However, the case findings suggest that the costs associated with evaluating these ideas and inventions are not exceedingly great for the case companies, particularly when compared to the costs associated with developing the equivalent ideas and inventions

## Chapter 7

internally or searching for them outside of the company, which is reflected in the statement from Mark Peterson, Director of External Business Development at P&G:

“The best way to get them [ideas and innovations] in efficiently these days is actually via the web. We have a website where people submit their ideas.”

Second, it is important to note that even though attraction represents an economical way of accessing new opportunities, the capture of those opportunities typically requires the recipient firm to devote resources to develop the ideas or inventions that it attracts into commercial products. These later-stage costs typically cannot be mitigated, even for highly attractive firms.

### 7.3.3 Attraction puts firms in favorable positions to make decisions

Finally, the analysis suggests that firms that are highly attractive to external innovators generally are in a better position to make *informed and accurate strategic decisions* about which technologies and product areas to invest in and which customers to target compared with less attractive firms that have to rely on their own search. Two underlying reasons for this effect of attraction have been identified.

#### Combining otherwise unconnected information

First, the case analysis suggests, as previously outlined, that attractive firms, because they interact with many different actors that each possess different information and knowledge, tend to become exposed to unique sets of information and thereby get the opportunity to combine otherwise unconnected information and knowledge (Hargadon & Sutton 1997). This opportunity to combine and synthesize multiple sets of information tends to give attractive firms *a unique overview of the industry*, which enables them more readily to discern emerging trajectories in their industries with respect to technological development, changes in customer preferences, and other factors. This, in turn, tends to put the attractive firms in particularly advantageous positions to be able to make informed strategic decisions compared to firms that have to rely on only the information that they have collected through their own search.

### **The distribution of external impulses as a source of information**

Second, it can be inferred from the study that the inflow of external impulses that firms attract, in terms of the *distribution of impulses between different product areas, may in itself contain important information*. In effect, the analysis suggests that the distribution of the external impulses, in terms of the number of impulses, the product areas that the impulses target and the changes over time in this inflow, also provides important information to the recipient firm. For example, if a firm receives a large number of impulses related to a certain type of emerging product area in which it has not yet established a presence, this may constitute a signal that this product area is about to “take off” and that the firm should consider establishing a presence in this area. Likewise, if the inflow of external impulses that target a specific product area in which a firm has previously attracted many impulses starts to decline and “dry out,” this may represent a signal that the area is starting to mature and that innovative activity in this area is slowing down.

Taken together, this suggests that the distribution of the external impulses that a firm attracts can provide valuable information, which is not otherwise readily available, about the nature of the innovation that is being conducted outside of the firm, and hence offers guidance to the firm about the areas in which it should focus its future investments and the junctures at which it should increase or decrease its own innovation efforts in different product areas.

In addition to this, the distribution of the impulses that a firm attracts can also provide a firm with potentially valuable information about how it is *positioned for the future*, in terms of how well it is expected by the external actors in its environment to be able to respond to anticipated changes in its environment. This aspect of attraction derives from the fact that the inflow of impulses that a firm attracts is partly *a function of how much confidence the community of external innovators has in the future prospects of the firm*. In effect, if the community of external innovators perceives that the firm is on the right track and is well positioned for the future within a certain product area given the changes that are anticipated to occur, then the firm will be considered an attractive partner and will typically attract an extensive stream of impulses that are related to that area. If, on the other hand, the community of external innovators believes that the firm is in an unfavorable position given anticipated changes in

## Chapter 7

the industry (e.g., due to the advent of a new disruptive technology that is expected to undermine the firm's competitive position), then its attractiveness will diminish and the stream of impulses will likely begin to evaporate. This pattern occurs because when external innovators select a firm to approach with a new idea or a new technology, they essentially place bets on which company they believe to be best positioned to successfully commercialize their idea or inventions. Hence, if a focal firm is perceived by many external innovators to offer the best opportunity for commercialization within a certain product area, it will receive a large inflow of external impulses (cf. Gans & Stern 2002). If, on the other hand, external actors identify other and better routes to commercialization, such as working with a venture capitalist or a competing firm, the inflow of impulses to the focal firm will likely decline.

This suggests that the aggregated stream of proposals that a firm receives, or does not receive, in itself constitutes a form of *market assessment of the firm's future prospects*. Since external innovators often are experts in their respective areas and are highly motivated to find the best route to commercializing their ideas and inventions, there is reason to believe that their collective assessments of and behavior vis-à-vis the focal firm carry important information and should be taken seriously by the firm. Specifically, if the inflow of impulses within a certain product area, or in the more general market environment, begins to diminish, it may constitute a serious warning signal that the firm is not perceived to be up-to-date with the most recent developments in the industry.

It is important to note that the significance of these arguments should not be overstated, since external innovators by no means possess perfect information about either the focal firm's future prospects, or how the market is developing. In fact, they may often know even less than the focal firm since they typically are not aware of all the innovation that is underway within the focal firm or may have a less than comprehensive perspective of the field as a whole. However, it is argued here that the inflow, and in particular the fluctuations in the inflow, can constitute an important "second opinion" for the focal firm. One reason why these external innovators can be considered an important source of information is that they essentially bet with their own money and time that their collective analytical acuity and subsequent behaviors, as argued previously, constitute a type of market assessment of the focal firm's prospects and how the market is devel-

### *Attraction: A new driver of learning and innovation*

oping. Significantly, assessments upon which groups of actors bet their own money have in other settings proved superior to expert opinions, which suggests that they should also be taken seriously by the recipient firms in this context (cf. Surowiecki 2004).

★ ★ ★

Altogether, the analysis set forth in the previous sections points to a number of benefits that differentiate attractive firms from firms that have to rely on their own search. In short, the analysis suggests that attractive firms are able *to more broadly explore the opportunity landscape that they face* than are firms that have to rely on their own search, which strengthens attractive firms' *ability to explore new sources of advantage and lessens the risk that they will fall victim to different types of learning traps*. In addition, attractive firms are typically in a more favorable position to make *informed and accurate strategic decisions* compared to firms that have to rely on their own search, as they become exposed to a broader information set and a more diverse pool of perspectives. The analysis also suggests that attraction enables firms to *economize on costs* associated with innovation and search.

Finally, after having outlined these features of attraction, in the following section, this chapter is concluded with a discussion that brings together and synthesizes some of the various strands that have been explored in the previous chapters.

#### **7.4 Attraction power: Conclusions and propositions**

In conclusion, this study reveals that firms, in addition to other qualities and capabilities that they are known to possess that enable them to innovate, learn, and renew their strategies, also may attract external actors to approach them with ideas and inventions that these actors seek to realize in cooperation with the focal firm, which implies that these firms may possess what I refer to as *attraction power*. Based on the analysis set forth in the previous sections, I propose as a definition of this concept that a firm has attraction power if (i) *external actors are able to identify opportunities pertaining to new products and technologies that involve the firm's resources and capa-*



## Chapter 7

bilities, and if (ii) *they are inclined to approach the firm in order to present it with the possibility of leveraging these opportunities.*

As outlined in Chapter 6, a firm's attraction power is determined primarily by the nature of its resource base, and specifically by the extent to which external actors perceive that this resource base can provide services that will help them reach their goals, such as commercializing a new product idea that they have developed. Resources that are *valuable, unique, and fungible* in the sense that: i) they can provide services that are of value to external actors, ii) they cannot be easily replicated, and iii) they can be redeployed beyond their existing uses, are shown to be associated with high attraction power. Typical examples of resources in the case companies that create strong attraction power are DeLaval's worldwide distribution network, without which it is difficult to commercialize new products in its industry, and Autoliv's long-term relationships with the major car markers, without which it is difficult to get new safety products accepted by players in the industry.

In addition, auxiliary factors such as *high visibility, high receptiveness to external impulses, high trustworthiness, and a high degree of openness and transparency* with respect to the firm's resources and future intentions are also shown to create and enhance attraction power. Notably, the study shows that a firm can *to some extent deliberately strengthen its attraction power* by making itself highly visible, by signaling that it is receptive to external impulses, and by revealing information about its resources and future intentions. However, the study also suggests that a firm's attraction power to a large extent *emerges spontaneously as a byproduct of its regular operations, its operational resources and capabilities, and its previous track record of successes in the marketplace.* Importantly, a firm's attraction power is hence *only partly controlled by the firm*, since the extent to which it is attractive ultimately lies in the eyes of the beholders, i.e., the potential impulse providers that may or may not choose to approach the firm to present their ideas and inventions.

As is outlined in the previous sections, possessing attraction power has a number of positive effects on firms. In the following section, these findings will be revisited and used to formulate a set of propositions that are intended to capture the core of what the study has found regarding how attraction affects firms.

★ ★ ★

*Attraction: A new driver of learning and innovation*

First, the study reveals that firms with attraction power tend to get access to *a larger pool of ideas and inventions around which to innovate* compared to less attractive firms that have to rely on their own search. This increased pool typically consists partly of technologies and products that can be put to commercial use immediately, and partly of undeveloped ideas and inventions that constitute new starting points for the recipient firms' additional and future searches and hence serve to re-direct their own search into new directions. Further, because the ideas and inventions that a firm attracts are based on the cognitions, practices, technologies, and norms of *a multitude of external actors*, this pool of ideas and inventions tends to be *more diverse* than the pool of ideas and inventions that the firm creates or identifies through its own search, which is based on the firm's own, and typically more homogenous, cognitions, practices, technologies, and norms. In sum, this implies that firms with attraction power not only get access to a larger pool of ideas and inventions, but also have a more *diverse* pool to draw upon as they select their new products, technologies, and strategies. I hence propose that:

Proposition 1: Firms with high attraction power get access to a larger and more diverse pool of ideas and inventions to innovate around, and from which to select their future products, technologies, and strategies (than firms with weaker attraction power that have to rely on their own search).

In addition, since the ideas and inventions that firms attract tend to be more diverse than those that firms identify through their own search, they often infuse significant new knowledge into the firms' innovation processes, which in turn tends to *stimulate the exploration of new opportunities and new sources of advantage*, as well as to trigger more *radical innovation* than what can typically be achieved through regular internal innovation processes (March 1991, Ahuja & Lampert 2001). I thus suggest that:

Proposition 1a: Firms with high attraction power are in better position to broadly explore new opportunities and engage in radical innovation (than firms with weaker attraction power that have to rely on their own search).

Further, the study suggests that the fact that attractive firms get "pushed" to encounter a wider range of perspectives as a result of external actors presenting them with ideas based on their *idiosyncratic vantage points* decreases the risk that these firms will fall into vari-

## Chapter 7

ous types of *learning traps* (Levinthal & March 1993, Miller 1994). In effect, the analysis indicates that the broader scope of exploration that is enabled by attraction lowers the probability that a firm will become *myopic* and fail to notice important changes in its environment that require the firm to adapt. Likewise, it suggests that the fact that firms with high attraction power get exposed to new impulses even at times when they themselves *lack the motivation to search* alleviates the negative consequences of the common tendency among firms to reduce the intensity and scope of their search and information acquisition when they have experienced success for an extended period of time (Cyert & March 1963, Miller 1994). I hence propose that:

Proposition 1b: Firms with strong attraction power are less likely to become myopic and to fall into success-induced learning traps (than firms with weaker attraction power that have to rely on their own search).

Second, the study suggests that by being exposed to a variety of new ideas and inventions that originate among a multitude of external actors who differ in terms of their cognitions, technologies, capabilities, and ambitions, attractive firms tend to gain access to a unique set of information that they can combine and synthesize, which in turn allows them to gain a superior understanding for their competitive environment with respect to how it is evolving, in terms of technological development, changes in customer behaviors, and other factors. This implies that firms with strong attraction power typically are in a more favorable position to learn about changes and trends in their environment, which can support their strategic decision-making regarding the selection of technologies and product areas to invest in and customers to target in the future (Barr et al. 1992, Teece 2007). I hence propose that:

Proposition 2: Firms with high attraction power are better positioned to sense changes and trends in their competitive environment and thereby to make informed and accurate strategic decisions (than firms with weaker attraction power that have to rely on their own search).

Third, the study suggests that attraction represents a more economical mechanism for exploration than search, since attraction typically entails lower costs and less effort than search for the focal firm. In effect, in those instances where a firm attracts external impulses, the

*Attraction: A new driver of learning and innovation*

impulse providers have developed the ideas and initiated contact with the recipient firm, which means that they *have borne all the costs up to that point*. At that stage, the recipient firm can choose which of the impulses to adopt, and importantly, it only needs to pay for the ideas or inventions that it actually chooses to adopt and can benefit from, whereas the costs for the impulses that they reject have to be fully borne by the impulse providers. In contrast, in search-based exploration, the focal firm must also bear the costs for failed efforts that it chooses not to pursue. This implies that firms that have high attraction power do not need to bear the full cost of the degree of exploration from which they can benefit, and that because of this “low-cost” exploration, attractive firms do not need to invest as much in search-based exploration as less attractive firms that have to rely only on their own search. Hence:

Proposition 3: Firms with high attraction power can afford to invest less in resource-intensive exploration activities and thereby incur lower costs for their exploration (than firms with weaker attraction power that have to rely on their own search).

★ ★ ★

In sum, based on the reasoning set forth in the previous sections, it can hence be concluded that firms with strong attraction power enjoy certain advantages in terms of their potential for learning and innovation, and ultimately, their prospects for sustaining and renewing the basis of their competitive advantage compared to firms that exert little or no attraction on external innovators and hence need to rely solely on their own search. In the following chapter, these findings will be related to prior theory in order to investigate whether and how the findings discussed above, and the introduction of the attraction concept, moderates, challenges, and extends existing theoretical predictions.

# Chapter 8

## Discussion and implications

As outlined in the introductory chapters, this study addresses the larger issue of how firms sustain and renew the basis of their competitive advantage through learning and innovation. As such, the study has sought to investigate attraction in order to further our understanding of this issue. In keeping with this aim, this chapter relates the findings of the study to existing theories about the factors that enable and impede learning, innovation, and ultimately the creation of new strategies in firms, in order to explicate *the theoretical implications* of the study. Specifically, this chapter addresses existing theories about *organizational search* (Cyert & March 1963, Greve 2003, 2007), *dynamic capabilities* (Teece et al. 1997, Eisenhardt & Martin 2000, Pierce et al. 2002, Teece 2007), and *strategy creation in established firms* (Burgelman 1983b,c, Regnér 2003) by outlining the ways in which the findings of this study challenge or moderate the predictions of these theories. In addition, a set of managerial implications are formulated, which are intended to inform managers in established companies, as well as innovators that seek to interest large firms in their ideas and inventions.

## **8.1 Implications for the organizational search literature**

As was demonstrated by the findings presented in the previous chapters, the pool of ideas and inventions from which firms select their new products and strategies typically is not limited to the ideas and inventions that they find or create through their own search, which is broadly defined to include both external search processes and internal innovation processes. Instead, in addition to the ideas and inventions that are outcomes of own search efforts, firms also become exposed to ideas and inventions as a result of the attraction they exert on external actors and the search activities of external actors who seek to combine their ideas and inventions with the resources and capabilities of the focal firm.

However, as shown in the theoretical review in Chapter 2, most existing search-based theories do not take into account *other actors' search* and the possibility of *attraction*. In response to this gap in the literature, in this section, I outline the implications of this study's findings for existing theories about organizational search by showing how the theoretical predictions of the extant literature are moderated by taking attraction and other actors' search into consideration. The first part of this section addresses Cyert & March's (1963) behavioral theory of search, as well as later contributions in the same tradition by Greve (2003, 2007), while the second part of this section addresses the literature pertaining to the ways in which a firm's performance can influence its search behaviors and learning outcomes (Miller 1993, 1994).

### **8.1.1 The behavioral theory of search**

As discussed in previous chapters of this thesis, Cyert & March's (1963) behavioral theory of organizational search has had a profound impact on subsequent search theories and the generally received understanding of organizational behavior. The theory is based on a number of key assumptions; first, that search is *motivated* (or *problemistic*) in the sense that firms engage in search in response to *concrete problems* or *a discrepancy between the firm's current performance and its aspiration level*; second, that firms are *satisficers* and that once a satisfactory solution has been identified by the firm, search (e.g., for more optimal solutions) is abandoned; and third, that a firm's search is biased by the experiences and ambitions of the

## Chapter 8

firm, as well as by a tendency to look for new solutions in the same conceptual realm as existing solutions. Based on these assumptions, organizational search emerges as a process that is initiated as a result of concrete problems or unsatisfactory performance and that is conducted *sequentially*, as firms search initially for new solutions in the neighborhood of existing solutions and then gradually explore more distant contexts if the local search fails to provide satisfactory solutions. Based on these assumptions and the typical depiction of the processes through which firms search, prevailing theory predicts that: (i) once a firm has identified a satisfactory solution, it discontinues its search and refrains from looking any further for new solutions, and as such, may overlook other potentially beneficial solutions and (ii) due to local search biases, firms rely primarily on solutions found within their local environments and may thereby often overlook more optimal solutions that exist outside of their standard frames of reference.

This means that extant theory is relatively *restrictive* (or pessimistic) with respect to its predictions about the likelihood that firms, especially successful firms, will identify new and more optimal solutions outside of their local contexts.<sup>146</sup> However, the findings of the current study call these restrictive predictions into question and suggest that these underlying assumptions are not as restrictive as has previously been assumed. Significantly, this study shows that even with the underlying assumptions of satisficing and biased search kept intact, *firms are more likely to be equipped to identify optimal solutions (more often) than existing theory would predict.*

With respect to the first prediction that firms *stop searching once they have found a satisfactory solution* and that they therefore *overlook more optimal solutions* that may be available, this study suggests that whereas the first part of the prediction is correct, the second part is not necessarily valid. The case analysis of DeLaval and the creation of its new product area for on-farm milk analysis equipment shows that DeLaval was satisfied with existing solutions for milk analysis before the creation of this new product category and that the

---

<sup>146</sup> Significantly, these restrictive assumptions reflect the assumptions of bounded rationality that characterize the literature on this subject, as well as the presumption that there are costs associated with gathering information about more optimal alternatives, and that it is therefore often rational for firms to engage primarily in search when an urgent need arises and to search primarily within their local contexts (Simon 1955).

*Attraction: A new driver of learning and innovation*

company therefore had little motivation to search for better solutions. Hence, in accordance with the existing theoretical prediction, DeLaval did not initiate any search within this field. However, the case study also shows that despite its lack of motivation to search, DeLaval was still exposed to the opportunity to develop instruments for on-farm milk analysis (a move that, from DeLaval's perspective, has proven to be a more optimal solution compared to previous solutions, since it has provided profitable growth for the company). As can be seen from the case analysis, DeLaval was only able to benefit from this solution because an external actor, Danish startup ChemoMetec, was highly motivated to engage in search within this area. Because the people behind ChemoMetec believed that they needed the support of DeLaval to successfully commercialize the envisioned solution, the opportunity was brought to DeLaval's attention.

This example shows that *a firm can be exposed to more optimal solutions even if the company itself has no motivation to search for better alternatives* if there are other actors that are motivated to engage in search and want to cooperate with the focal firm. Theoretically, this means that *the assumptions of satisficing and motivational search are not as restrictive as existing theory predicts* because the motivation of a focal firm to engage in search typically is *independent* of the motivations that compel other actors around that firm to engage in search.

With respect to the second prediction that firms often are *limited to solutions drawn from their local contexts* because of biases in their search processes, the findings of the study suggest that even if these search processes are as biased and local as the theory states, firms are typically not as restricted as has been previously assumed, because they can benefit not only from their own search but also from *the search of other actors*. Specifically, the study shows that the search processes of different actors are *biased in different ways*, and further, that they tend to be *asymmetrical* in the sense that if two actors may be able to benefit from combining their resources, the actors are typically not equally likely to identify the combinatorial opportunity. This means that firms, thanks to other actors' search, often are exposed to solutions and opportunities that they would not have identified through their own search. A notable example of this is the case of Yamaha and the creation of the digital synthesizer based on FM synthesis technology. This case shows that Yamaha was engaged in intense internal and external search for solutions that would enable it to produce a high-quality digital synthesizer, but that its search



## Chapter 8

processes were too limited and thus failed to produce satisfactory solutions. However, the case also shows that despite its limited search processes, Yamaha became exposed to a solution, FM synthesis, that would solve the problem, because an external actor (the Stanford Office of Technology Licensing) had identified Yamaha as a viable target and sought to present the FM synthesis technology to the company in the hopes that Yamaha would be able to make use of it in a commercial application. In other words, although Yamaha's own search proved to be too local and limited, its visibility and attraction were sufficiently influential to allow the firm to be identified by the Stanford Office of Technology Licensing, which possessed a superior solution that was able to solve Yamaha's previously intractable problem. This example illustrates how asymmetries between the search processes of different actors can grant a focal firm access to a broader pool of solutions than one would predict when taking only its own search efforts into account.

★ ★ ★

In sum, this discussion shows that taking attraction and other actors' search into account moderates some of the predictions of Cyert & March's (1963) behavioral theory of organizational search by making them less restrictive with respect to firms' potential for innovation and the identification of more optimal solutions. Specifically, this study shows that firms, thanks to *the attraction that they exert and other actors' search*, can become exposed to new and better solutions even when they have already found satisfactory solutions, and further, that firms are not limited to the solutions that lie within the scope of their own (local) search.

In addition, by showing that not all new solutions are the result of firms' failure-induced search, and by pointing to a mechanism through which already-successful firms innovate and identify new solutions, this study also complements Cyert & March's theory of *slack-driven innovation*. The notion of organizational slack was advanced in order to accommodate within the behavioral theory of the firm the empirical observation that not all innovation is problematic and local, but that also successful firms innovate and that they at times even engage in non-local search and more radical innovation. Cyert & March argued that the non-local innovation that could be observed in successful firms derived from the existence of unused hu-

### *Attraction: A new driver of learning and innovation*

man or material resources within firms, i.e., *organizational slack*, which tends to trigger *experimentation* within the firm that is more far-reaching than the problemistic and local search that otherwise typically characterizes organizational behavior. Significantly, the current study, and the concept of attraction, complements this explanation by offering *an additional theoretical explanation* for why successful firms innovate and why non-local innovation arises in such firms, that is also *consistent with the underlying assumptions of the behavioral theory of the firm*. The relative power of these two explanations, slack and attraction (and other actors' search), is however an empirical question, which this study cannot conclusively answer. This study does, however, offer empirical evidence of the validity of attraction as an explanation for why successful and satisfied firms innovate.

In the next section, this connection between a firm's performance and its potential for learning and innovation will be further discussed in light of the findings of this study.

#### **8.1.2 Implications for the effects of firm performance on learning**

As pointed out in the previous section, a key tenet of Cyert & March's (1963) behavioral search theory is that failure induces firms to engage in search, and that this search typically results in the identification of new solutions, as well as in *organizational learning*. This theoretical link between *a firm's performance, its inclination to engage in search, and its potential for learning and adaptation* has been an important theme in subsequent work on organizational learning and innovation (Miller 1994, Greve 2003, 2007).

More specifically, it has been suggested within this body of literature that *success weakens a firm's motivation to search*, and that the decline in the intensity of search, scanning, and information acquisition associated with high performance tends to *hamper organizational learning* (Lant & Montgomery 1987, Miller 1993, Levinthal & March 1993). Further, it has been argued that the positive reinforcements that are associated with success induce firms to *search less broadly* by focusing on areas where they have previously experienced success, a tendency that fosters specialization and deeper learning in existing areas of expertise but that simultaneously limits their exploratory learning in new areas (Levitt & March 1988, March 1991). On a similar note, Miller (1993) suggests that success reinforces existing rou-

## Chapter 8

tines and systems for search and information acquisition, which over time can cause firms to *institutionalize and routinize gaps in organizational intelligence*. This is further posited to reduce firms' potential for learning and adaptation by rendering them *myopic*, putting them at greater risk of failing to recognize new opportunities and threats that emerge outside the areas covered by their ingrained routines for search and information acquisition (Miller 1993).

In sum, this line of reasoning suggests that extended periods of corporate success put firms at risk of falling into different types of *learning traps*, which can in turn have detrimental effects on long-term future performance (Levitt & March 1988, Leonard-Barton 1992, Miller 1993, 1994), an argument that is summarized graphically in Figure 8.1.

In the following section, I discuss this body of literature in light of the findings of the current study. Based on these findings, I argue that some of the existing predictions about the relationship between firm performance and organizational learning are *moderated* by taking attraction and other actors' search into account. Specifically, I suggest that although it is evident that success can impede a firm's potential for learning, this relationship may not be as clear-cut as has been argued in the extant literature, and that previous contributions tend to *exaggerate the negative effects of success* on firms' potential for learning due to a failure to take into account the effect of attraction in the analysis of the relationship between performance and learning.

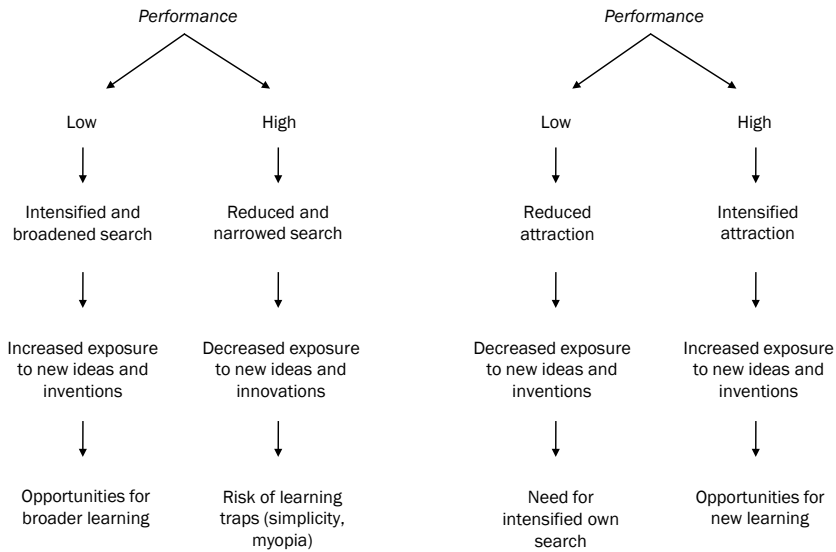
### The dual effect of success on firms' learning and adaptation

The fundamental argument that I make here, one which is represented graphically in Figure 8.1, is that whereas *success weakens firms' search-based learning*, success simultaneously *strengthens their attraction-based learning*. In effect, I suggest that whereas success, in accordance with the predictions of Cyert & March (1963) and Miller (1994), *lowers the intensity and limits the scope of a firm's search*, which in turn diminishes its potential for learning in general and its exploratory learning in particular, success also *increases the intensity of the attraction* that the firm exerts on external actors. This in turn leads to *a larger and potentially more diverse inflow of external ideas and inventions* into the firm and consequently increases its potential for learning. Vice versa, I argue that whereas low performance stimulates broader and more intense search and information acquisi-

*Attraction: A new driver of learning and innovation*

tion by a firm, it also decreases the intensity of the attraction that the firm exerts and thereby reduces the inflow of externally developed ideas and inventions.

**Figure 8.1 (i) The link between performance and search-based learning, and (ii) the link between performance and attraction-based learning**



Significantly, the reason why high performance strengthens the attraction that a firm exerts on external innovators is that innovators with new ideas and inventions, as suggested by the case findings, *prefer to associate themselves with successful firms*, and avoid underperforming firms, since they generally assume that successful firms represent a better route to the commercialization of their ideas and inventions than firms that are struggling. Hence, high-performing firms tend to attract a larger number of external impulses. Notably, this further implies that because the inflow of external ideas and inventions that firms attract will tend to be characterized by *a substantial degree of diversity*, successful firms will also tend to become exposed to *a wide scope of external impulses*, since a larger pool of

## Chapter 8

impulses will tend to contain a larger number of “outliers” than a smaller pool. Ultimately this means that, successful firms tend to gain access not only to a larger number of impulses from which to learn compared to under-performing firms, but also to *a more diverse pool of impulses from which to learn*.

In sum, I predict, based on these arguments, that success has a more ambiguous effect on a firm’s potential for learning and adaptation than has previously been acknowledged in the literature and that successful firms are *less vulnerable* than has previously been suggested to different types of learning traps. In effect, the risk that a firm will fall prey to search patterns characterized by myopia, overly narrow information acquisition, and a lack of exploration is argued here to be less pronounced than what has previously been assumed, since attraction to a certain extent *compensates* for success-triggered tendencies toward narrowed search and information acquisition by exposing the firm to a large and diverse pool of externally developed ideas and inventions.<sup>147</sup>

Importantly, however, this argument needs to be qualified, as it is subject to certain *boundary conditions*; in effect, the argument that was advanced in the previous paragraphs presumes that the focal firms possess a certain degree of *receptiveness to external ideas*, in terms of a willingness and an ability to learn from the external impulses that they attract (cf. Cohen & Levinthal 1990, Zahra & George 2002). It is important to note that if, on the other hand, a successful firm that attracts a large number of external impulses systematically rejects all of the external impulses that it attracts without paying attention to them due to, for instance, overconfidence among the firm’s managers, none of the positive attraction-based learning effects will in fact materialize. Whereas this possibility needs to be taken seriously, the empirical findings suggest that most of the companies that were investigated in this study chose to interact with impulse providers and pay attention to their ideas and inventions, which suggests that the argument advanced in this section has indeed been empirically validated. Having said this, however, it should be noted that the empirical findings also suggest that significant differences exist with respect to the degrees to which different firms take advan-

---

<sup>147</sup> Importantly, as shown by the study, *the extent to which attraction can compensate for reduced and narrowed search* differs between industries and between companies.

tage of the inflow of external impulses that they attract and thereby the extent to which attraction can alleviate myopic tendencies in their learning processes.

★ ★ ★

Further, in terms of the current study's contribution to the literature, the arguments advanced here should not be understood as efforts to question the relevance of the success-induced impediments to firm learning that were discussed previously, but rather to *moderate* the arguments made in the extant literature. In effect, the arguments made here largely *complement* the existing literature in the sense that they *explain a different phenomenon*. Whereas the existing literature primarily explains *corporate decline* through concepts such as *myopia* (Miller 1994), *competency traps* (Levitt & March 1988), *simplicity* (Miller 1993), and *core rigidities* (Leonard-Barton 1992), this study offers a theoretical explanation for *sustained patterns of performance* and specifically, the ways in which success, by creating attraction and stimulating an inflow of externally developed ideas and inventions, *reinforces further learning in a virtuous circle*, which in turn supports successful future adaptation (cf. Zahra 2008).<sup>148</sup>

Significantly, the existing literature pertaining to strategic renewal in firms suggests that both these patterns exist, and hence need to be explained, as it points to examples of both previously successful firms that have failed due to an inability to adapt to changing circumstances (Christensen 1997, Tripsas & Gavetti 2000), and firms that have been able to sustain their success over extended periods of time by adapting to changing circumstances through learning, innovation, and growth into new product areas (Burgelman 1991, Regnér 2003).

### **Reinterpreting existing empirical findings**

Notably, the arguments that are advanced here also have certain implications for the interpretation of previous empirical findings about firm behavior related to performance, search and learning. In accor-

---

<sup>148</sup> This argument represents a variation of the so-called Matthew effect, which has previously been described by Podolny (1993) and Podolny & Phillips (1996) in the context of the dynamics of organizational status. Their findings show that firms already possessing high status automatically incur an array of benefits, such as being able to produce similar products at a lower cost as compared to lower status firms.

## Chapter 8

dance with Cyert & March's (1963) predictions, Greve (2003) found that low performance (relative to aspiration levels) induces firms to engage in more R&D search. The finding that firms engage in more search when experiencing low performance is interpreted in light of the received assumption that firms are satisficers and hence tend primarily to search for better alternatives when they experience low performance or face concrete problems. The argument illustrated by Figure 8.1 however, points to a slightly different interpretation of this finding. The interpretation advanced here, which is supported by the analysis of Chapter 7 (7.3), suggests that the reason we observe higher search intensity among firms with low performance is not necessarily that the high-performing firms are satisfied or "lazy" and hence are less committed to learning and finding better solutions, but rather that *these firms do not need to search as intensely* as the low-performing firm, since attraction provides them with a sufficiently large and diverse pool from which to select future products, solutions, and strategies. This argument is not least reflected in the statement by Torbjörn Nilsson, former Senior Vice President of Strategy at Ericsson:

"Typically, we don't have to search for them, because these companies usually come to Ericsson anyway, wanting to promote themselves in different ways, so there is little risk that we will miss them."

This pattern of highly successful firms not having to engage in search as intensively as do less successful (and less attractive) firms is also reflected in DeLaval's choice of only devoting limited resources to search and technology scouting, and rather choosing to rely on external actors to approach the company and initiate the contact.

Taken together, this suggests that the differences in search intensity that can be explained by firms' performance may not necessarily imply that firms satisfice, but could also reflect that *attraction and search to some extent are substitutable*, and that a highly successful and attractive firm can to some extent rely on the fact that if there are better solutions available, they will be brought to light through attraction, thus obviating the need for the firms to engage in intense search. Theoretically, this translates into the proposition that *the marginal benefit of additional search is lower for a firm that is successful* and thus can attract a large number of externally developed ideas

### *Attraction: A new driver of learning and innovation*

and inventions than for a less successful firm that attracts fewer externally developed ideas and inventions.<sup>149</sup>

#### **Conclusions**

In sum, contrary to the prediction that high firm performance hampers learning as a result of lower motivation to search and to acquire new information (Cyert & March 1963, Miller 1994), it is contended here that *firms with high performance are in a favorable position to learn* because of the substantial inflow of externally developed ideas and inventions that they tend to attract. It is further argued that the lower search intensity that can be observed in firms with high performance does not necessarily reflect a lower commitment to learning of the sort that results from satisfaction or complacency, but may instead reflect the fact that because of the high attraction they exert on external actors, these firms *can afford to invest less in own search* and still be in a favorable position to learn.

Finally, after having emphasized the learning-related benefits of success, it is, however, important to again stress the previously mentioned caveat regarding these arguments. In effect, even if an inflow of externally developed ideas and inventions provides *ample opportunities for learning*, these only contribute to firms' learning if the firms take these opportunities seriously and make use of them. On the other hand, if a firm disregards this inflow of externally developed ideas

---

<sup>149</sup> As an illustration of this argument from a different setting, imagine a successful Hollywood star at the peak of her career and compare her search behavior to that of a less successful actor who is struggling to make a living in Hollywood. We can probably assume that the struggling actor engages in more intensive search activities for parts in films than does the famous actress. According to the existing behavioral search theories, these differences can be explained by differences in the motivation to search, insofar as the star actress is satisfied, whereas the struggling actor is not satisfied and hence engages in search in order to narrow the gap between his actual performance and his desired level of performance. I argue, however, that whereas the star actress may be satisfied in one sense, there is no reason to believe that she does not want to find the very best and most interesting parts that are available to her, and the reason that she engages in less search is not that she is not motivated to find the best parts. Instead, I argue that the reason that she engages in less search is that because of her previous success, she can safely assume that any interesting casting opportunities *will be presented to her without her having to exert effort in order to find them*, which is a luxury that the less successful actor, who is forced to identify potential opportunities through his own intense search efforts, cannot afford.



and innovation due to hubris, overconfidence, or other factors (Miller 1993, Kroll et al. 2000), it will remain fully susceptible to the learning traps that have been set forth in the extant literature (Levitt & March 1988, Miller 1993, 1994). In other words, it is vital to remember that success and the attraction it creates cannot drive learning per se, but that it merely provides firms with opportunities and put them in a favorable position to learn.

## 8.2 Implications for the dynamic capabilities literature

Helfat et al. (2007, pp. 1) define a dynamic capability as the “capacity of an organization to purposefully create, extend, or modify its resource base,” and they stress that firms need to develop such dynamic capabilities in order to survive and prosper under conditions of change. Pierce et al. (2002) argue that a firm’s dynamic capabilities depend on two dimensions: its ability to *identify opportunities* and its *ability to accommodate and exploit them*. This distinction is also echoed in Teece’s (2007) disaggregation of dynamic capabilities into the constituent capacities to *sense opportunities and threats*, to *seize opportunities*, and to *enhance and re-configure tangible and intangible assets to exploit the opportunities or fend off the threats*. The findings of this study have a number of implications for the first dimension of dynamic capabilities, related to *the identification and perception of opportunities and threats*. In particular, three implications stand out, each of which will be outlined and discussed in the following sections.

### 8.2.1 External perceptions as determinants of sustained competitive advantage

The purpose of the dynamic capabilities framework is to explain how firms can sustain their competitive advantage over time. A central tenet of the dynamic capabilities view is that the development and exercise of internal dynamic capabilities determine the enterprise’s long-term success or failure (Teece et al. 1997, Eisenhardt & Martin 2000, Teece 2007). Although the findings of this study partially support this view, not least by outlining in a subsequent section how attraction can in itself be considered to be a dynamic capability, it is, however, also suggested here that the previous literature may have

*Attraction: A new driver of learning and innovation*

*overstated the importance of internal dynamic capabilities* and that factors other than internal dynamic capabilities may need to be taken into account in order to explain why and how some firms are able to sustain and renew their competitive advantage through innovation, learning, and growth into new product areas, whereas other firms fail.

The findings of this study suggest that a firm's potential for learning, innovation, and ultimately its prospects for renewing the basis of its competitive advantage is determined not only by internal capabilities and activities initiated by the firm itself, but also *by initiatives by external actors* who seek to commercialize their ideas and inventions in cooperation with the firm. As outlined in the previous chapter, this study shows that while a firm can partially influence the type of ideas and inventions that it attracts, the magnitude and nature of this pool of external initiatives and the associated inflow of externally developed ideas and inventions ultimately lies *outside of the control of the focal firm*, as it depends on the decisions made by each potential external innovator. Importantly, these external innovators will only choose to approach the firm if they believe that this will further their own interest and that the potential partnership represents a better option than the alternatives, such as approaching a competing firm or trying to commercialize the idea on their own or with the support of a venture capital firm. This means that an important mechanism through which firms can become better informed about new ideas, inventions, and opportunities lies largely *out of their own control*, as it is governed by the independent decisions of external actors. In other words, a significant share of the pool of ideas, inventions, and opportunities from which a firm selects its future products and strategies is largely created *independently of the focal firms' own dynamic capabilities*.

★ ★ ★

Altogether, this suggests that a firm's ability to identify new opportunities, which is a central component of its ability to sustain and renew the basis of its competitive advantage (Pierce et al. 2002, Teece 2007), is not as strongly determined by the quality of its internal dynamic capabilities as has been assumed in the extant literature, as the firm's ability to identify these opportunities depends largely on whether the right externally developed ideas and inventions find their

## Chapter 8

way to the firm through outside channels. Notably, this finding shifts the locus of explanation from the firm's own dynamic capabilities to *the many independent decisions made by external innovators about how best to leverage their ideas and inventions*. The implication of this shift in perspective is that a dominant firm, in order to sustain and renew its competitive advantage, is dependent not only upon its internal dynamic capabilities, but also upon how it is *perceived* by external innovators in its environment, in terms of their assessments of the firm's future prospects of retaining its competitiveness and thereby still offering an attractive route to the commercialization of new ideas and inventions within the industry. This further implies that even a firm that has invested heavily in developing dynamic capabilities runs the risk of failing if the external community of innovators loses *faith in its ability to manage upcoming changes and to dominate the market in the future*, since external innovators will then tend to place their bets elsewhere, so to speak, and the firm will no longer be exposed to valuable new ideas and inventions that emerge outside of the firm.

In sum, this suggests that to predict the likelihood that an incumbent firm will be able to sustain and renew its competitive advantage, we must *look beyond the internal dynamic capabilities of that firm and study the perception of the firm among the community of external innovators* in terms of how they assess the firm's prospects and whether, based on that assessment, they intend to seek to commercialize their ideas and inventions through that firm in the future, since such inflows of externally developed ideas and inventions have been shown in the study to help incumbents identify emerging opportunities and threats, an ability that is known to be crucial to sustaining competitive advantage over time.

### 8.2.2 Attraction as a dynamic capability

Despite the perspective that was advanced in the previous section, where it was argued that the extant literature may have overstated the importance of firms' internal dynamic capabilities, the conclusions of the study are also partially compatible with the received dynamic capabilities view, since they suggest that the ability to deliberately strengthen a firm's attractiveness among external innovators and thereby stimulate the inflow external ideas and inventions can be understood as *a previously unrecognized dynamic capability*.

*Attraction: A new driver of learning and innovation*

As argued, a dynamic capability is constituted by the purposeful and systematic nature of the underlying activities, and in accordance with this definition, the study reveals that three of the case companies, namely, DFJ, P&G, and Ericsson Multimedia, exhibited purposeful and systematic activities aimed at attracting external ideas and inventions and intended to contribute to renewing the firms' product portfolios and upgrading their underlying resources and capabilities.<sup>150</sup>

These activities that undergird the dynamic capability of attracting external impulses include *increasing the firms' visibility* among external actors and *revealing aspects of their resources and future strategic intentions* (cf. Henkel 2006). In the case of P&G, this specifically includes (i) efforts to build *an innovation brand* through the systematic promotion of the Connect + Develop approach to innovation by means of frequent media appearances by top executives; in-depth descriptions in the business press of the company's approach to innovation; and systematized procedures for handling and evaluating the impulses the company attracts; and (ii) the careful formulation and systematic broadcasting of the company's technology needs and its prioritized innovation areas. These activities are intended to increase the likelihood that external innovators that exist in the environment around P&G will be able to identify how their ideas or inventions can fit into P&G's innovation efforts and to increase the likelihood that they will choose to approach P&G once they need a partner to commercialize a new idea or invention.

On a similar note, Ericsson Multimedia *selectively reveals information and shares certain parts of its technology and software* with the external community of innovators through the Ericsson Developer Connection, in the hopes that external innovators will be more inclined to approach and choose to work with Ericsson Multimedia when they are seeking to commercialize new ideas or inventions, which in turn will strengthen Ericsson Multimedia's capacity to manage the dynamism of the industry. Other activities that are intended to strengthen a firm's attraction include DFJ's efforts to establish *a position of leadership in people's perceptions in new and emerging*

---

<sup>150</sup> It is, however, important to note while discussing how firms seek to attract external impulses, that firms, as previously argued, can only partially control which external impulses it attracts, since the decision to approach them ultimately is made by the potential external impulse providers.

## Chapter 8

*areas* in which the company has taken an interest through frequent media appearances, blogging, and conference speeches. By staking out a position of perceived leadership, DFJ seeks to establish itself as the primary choice for entrepreneurs who are active within these areas and are seeking financing, thereby increasing the likelihood that the firm will attract the best investment opportunities within these fields.

In sum, these observations of *the purposeful and patterned nature of the activities*, along with *the dynamic intent* of the activities, suggest that the capacity to stimulate the inflow of externally developed ideas and inventions by strengthening the attraction that the firm exerts on external innovators qualifies as a dynamic capability. The findings specifically suggest that attraction represents an addition to the above-mentioned class of dynamic capabilities, such as R&D, environmental scanning and technology scouting, all of which drive innovation and enable firms to sense opportunities to grow into new areas by developing novel products and services (Pierce et al. 2002, Teece 2007).

### Divergent microfoundations

However, a comparison of the *microfoundations* underlying these different dynamic capabilities points to a fundamental difference between attraction and previously described dynamic capabilities. The extant literature pertaining to this class of dynamic capabilities has been based largely on the assumption that a firm's capacity to sense new opportunities is determined by *its capabilities in search and scanning*, which is reflected in Teece's (2007) statement that: "[to] identify and shape opportunities, enterprises must constantly scan, search, and explore across technologies and markets." This quote suggests that in order to improve their chances of identifying opportunities and threats in a timely and accurate manner, firms must intensify and improve their innovation, scanning and scouting activities by means of, for instance, investing in their systems for R&D, business intelligence, and technology scouting, and seeking to improve their ability to interpret and make sense of the information they collect.

Attraction as a dynamic capability, on the other hand, rests upon a distinctly divergent set of activities. Unlike the activities that Teece (2007) emphasizes, which are aimed at *strengthening the perceptual and cognitive capabilities of the focal firm*, attraction-enhancing activi-

*Attraction: A new driver of learning and innovation*

ties are aimed at *influencing how external actors perceive and understand the focal firm* in such a way that they will become more likely to identify opportunities that involve the focal firm and also more inclined to approach the firm to present these opportunities. The microfoundations of attraction as a dynamic capability hence include activities related to *increasing the firm's visibility and prominence in people's minds*, such as *communication* (Gray & Balmer 1999) and *impression management* (Elsbach & Sutton 1992). Essentially, this comparison shows that whereas the microfoundations underlying conventional dynamic capabilities are intended to make the focal firm's personnel *more knowledgeable and better informed* through improved methods for information gathering and translating the information into opportunities and threats, the microfoundations undergirding attraction are intended to *shape how people in the external environment perceive the firm*, and specifically, to make them more knowledgeable about it in order to facilitate for them to identify opportunities that involve the focal firm, thereby encouraging them to "help" the focal firm by offering it ideas and opportunities.

Significantly, as a result of these differences in the microfoundations that underlie search-based dynamic capabilities and attraction as a dynamic capability, the findings of the current study also suggest that search and attraction tend to create somewhat different outcomes for firms, in the sense that attraction provides firms with a different set of information, ideas, inventions, and ultimately opportunities compared to those that can be identified through the firms' own search. Previous work on dynamic capabilities emphasizes that it is necessary for firms to explore both local and distant contexts, since firms need both incremental innovation and strategic adjustments and more radical innovation and strategic re-orientations in order to sustain their competitive advantage over time (Helfat et al. 2007, Teece 2007).

In relation to this imperative to combine local and distant search, as well as incremental and radical innovation, the findings of this study suggest, in accordance with previous studies, that firms' dynamic search capabilities typically are *well adapted for investigating their local contexts*, but that *overcoming these narrow search horizons can be difficult and costly*, as firms tend to become imprisoned in their own deeply ingrained search routines, knowledge structures, information systems, and problem-solving strategies (Teece 2007). However, as outlined in Chapter 7, this study further suggests that

*attraction is less bound by these restrictions, as the impulses that a firm attracts are shaped by the search routines, knowledge structures, needs, and ambitions of a broad range of external actors. Attraction is thereby more likely to inform the firm about non-local opportunities, which implies that whereas dynamic search capabilities are relatively more suited to investigating the local context and driving incremental innovation, dynamic attraction capabilities are relatively more helpful for exploring distant sources of opportunities and of driving radical innovation and strategic re-orientation.*

### **8.2.3 The dynamic potential in operational resources and capabilities**

In addition to the identification of attraction as a dynamic capability and the role played by the assessments and decisions by external innovators for a firm's prospects of sustaining and renewing the basis of its competitive advantage, the current study also points to a relationship between *operational resources and capabilities* and *dynamic capabilities* that has not previously been recognized. As previously discussed, the dynamic capabilities view is based on the distinction between the operational resources and capabilities through which firms "make a living today," and their dynamic capabilities, which are purposeful and patterned ways of modifying and upgrading operational resources and capabilities (Winter 2003, Helfat et al. 2007). While it is acknowledged here that this is a valid and important distinction, the findings of this study show that the distinction may not be as clear-cut as previously assumed. In effect, the findings suggest that a firm's operational resources and capabilities do not necessarily support only existing operations, but that they can also perform important *dynamic functions*, as they can be major drivers of attraction and thus contribute significantly to stimulating the inflow of external ideas and inventions, which in turn, as shown by previous sections, contributes to informing the firm about new opportunities.

As was shown in the previous section, whereas all the case companies observed in this study receive an inflow of external ideas and inventions, only some of them engage in the type of deliberate and patterned activities with respect to building attraction that can be said to constitute a dynamic capability. Importantly, what can be seen in the cases in which the companies do not deliberately try to stimulate an inflow of external impulses is that the operational resources and capabilities of these firms *are in themselves sufficient to*

*Attraction: A new driver of learning and innovation*

*induce external actors to approach them with new ideas and inventions.* Notable examples are DeLaval and Autoliv, neither of which engages in any attraction-enhancing activities, because both firms possess the type of high-value operational resources, i.e., distribution networks and customer relationships, that in themselves tend to attract large numbers of external ideas and inventions.

★ ★ ★

In sum, these observations suggest that operational resources and capabilities that are sufficiently unique and valuable, such as the distribution systems and customer relationships possessed by DeLaval and Autoliv, can fulfill some of the same functions as dynamic capabilities, such as environmental scanning, technology scouting, and R&D, in the sense that they indirectly provide the firm with new information, ideas, and inventions. Thus, it can tentatively be concluded that firms with sufficiently valuable and unique resources and capabilities can to a certain extent *afford to invest less in the development of their dynamic capabilities*, while still remaining confident that they can rely on external actors to help them sense emerging opportunities and threats. Clearly, this argument should not be overstated, since all firms need to invest to some extent in dynamic capabilities such as internal R&D and environmental scanning. However, the findings suggest that the magnitude of the investments that need to be made in dynamic capabilities are often determined by the degree to which the firm's operational resources serve to attract externally developed ideas and inventions.

**Conclusions of the implications for the dynamic capabilities literature**

Taken together, the arguments that have been advanced in the previous sections demonstrate how the findings of this study and the identification of attraction as a phenomenon both extend and challenge the dynamic capability view as it has been outlined in the extant literature. By pointing to the roles played by (i) *external actors' perceptions and assessments* and (ii) firms' operational resources for their potential for learning, innovation, and ultimately strategic renewal, the study challenges the strong emphasis in the existing literature on a firm's internal dynamic capabilities. However, in addition to this criticism, it is also argued that the findings about the case companies' deliberate activities intended to strengthen the attraction



## Chapter 8

they exert on external innovators can be *reconciled with the dynamic capabilities literature* and may in fact constitute an extension of it by pointing to attraction as a previously unrecognized dynamic capability.

★ ★ ★

Finally, after having discussed the findings of the study in light of the dynamic capabilities view, in the following section the literature about *strategy creation in established firms* will be addressed. This literature deals with some of the same issues set forth in the dynamic capabilities literature but from a slightly different perspective.

### 8.3 Implications for the literature on strategy creation in large firms

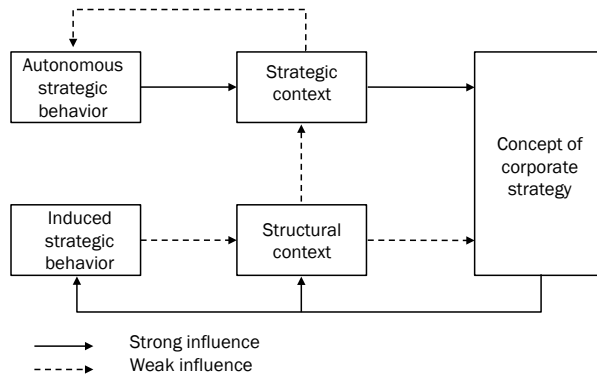
As was described in previous chapters, the findings of this study show that attracting externally developed ideas and inventions not only stimulates product-level innovation within the frames of the recipient firm's existing corporate strategy, but also at times can trigger changes in firms' corporate strategies by stimulating the development of completely new product areas. Notable examples of this, such as Apple's entry into the digital music industry and DeLaval's entry into the market for milk analysis instruments, suggest that the findings of this study may have certain implications for the literature about *strategic renewal and the creation of new strategies in established firms* (Burgelman 1983b, 1991, Regnér 2003).

With respect to strategy creation in established firms, one influential theory holds that the motor of strategic change is *the ecology of strategic initiatives* that emerge within firms as the result of opportunities that are identified by managers at multiple levels (Burgelman 1983b, 1991, Lovas & Ghoshal 2000). Based on this conceptualization, Burgelman (1983b) presents a conceptual model of the strategic process in large, complex firms, which is reproduced in Figure 8.2. This model illustrates how the evolution of a firm's corporate strategy is determined by the tension between *strategic behavior (initiatives) that is induced by existing corporate strategy* and *autonomous strategic behavior* that originates from the reservoir of entrepreneurial opportunities that are identified at multiple organizational levels and

*Attraction: A new driver of learning and innovation*

which depart from the existing corporate strategy. It further shows how these two streams of strategic behavior are mediated by a *structural context* that works as a selection mechanism to ensure that operational behavior is in accordance with the existing corporate strategy, and a *strategic context* that is constituted by the mechanisms through which proponents of autonomous strategic behavior can question the existing corporate strategy and argue for the inclusion of their initiatives in the firm's future corporate strategy.

**Figure 8.2 Model of the Interaction of Strategic Behavior, Corporate Context, and the Concept of Strategy**



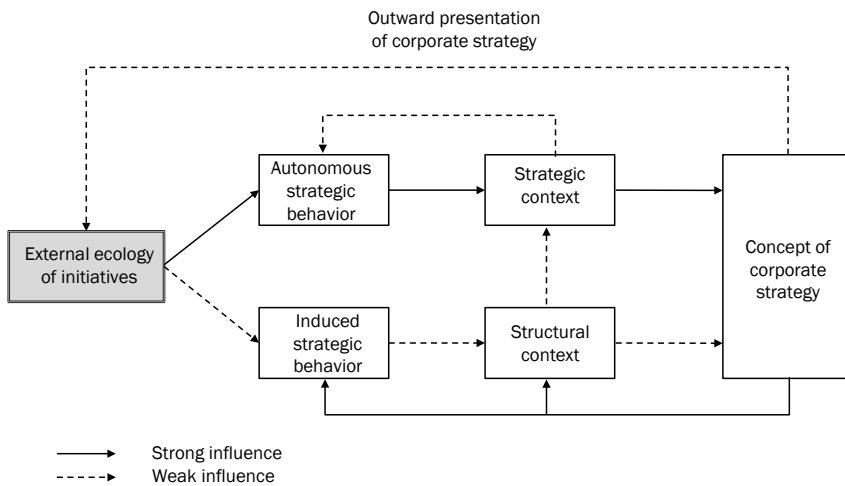
Source: Burgelman (1983b).

The current study addresses and engages this theory of the strategy process of large, complex firms by suggesting two extensions. First, the study shows that in addition to the internal ecology of strategic initiatives that emerge within firms based on opportunities that internal managers identify, there is an *external ecology of strategic initiatives* based on opportunities that are identified by external actors, but which are directed at the focal firm. Second, the study points to a previously unrecognized link between a firm's outward appearance and its potential for strategy creation; namely, the study shows that *the way a focal firm communicates and presents its corporate strategy*

## Chapter 8

influences the type of opportunities external actors identify which involve the focal firm and consequently, what kind of strategic initiatives they engage in vis-à-vis the firm. This in turn shapes the ecology of external initiatives, which constitutes a source of raw material for strategy creation upon which the focal firm can draw. Figure 8.3 graphically illustrates these proposed extensions of Burgelman's model. In the sections below, each of these extensions is discussed in greater detail.

Figure 8.3 Adaptation and extensions of "Model of the Interaction of Strategic Behavior, Corporate Context, and the Concept of Strategy"



Note: Adapted from Burgelman (1983b).

### 8.3.1 Ecologies of external initiatives and strategy creation

Previous research shows that a multitude of internal actors, including mid-level managers (Burgelman 1983, 1991, Wooldridge & Floyd 1990), operative personnel (Mantere 2005), and organizational peripheries (Regnér 2003), are involved in the strategy creation process of large established firms by identifying and pursuing internal strategic initiatives (Lovas & Ghoshal 2000). The current study extends this

line of research by showing that strategic initiatives arise not only within large, established firms, but also in the environment around them, as external actors identify opportunities that involve the focal firm and try to involve it in the exploitation of those opportunities. While consistent with the received notion that multiple actors are involved in strategy creation, the finding that external opportunity recognition and subsequent external strategic initiatives influence strategy creation in firms challenges the long-held assumption that a firm's potential for growth and strategic change is limited by the opportunities that internal managers can identify (Penrose 1959, pp. 31). This study shows that firms, in effect, are not limited to the opportunities that can be identified by personnel within the organization, since firms frequently "get help" from external actors who have identified opportunities that involve the focal firm.

A significant implication of this finding is that the analysis of strategy creation in large established firms should include not only the multitude of internal actors who engage in strategic behavior based on the opportunities they have identified from their *vantage points within the firm*, but also the diverse group of actors who observe the focal firm and the environment from *different vantage points outside the firm*, and who tend to identify a different set of opportunities compared to those that are identified from within the firm, based upon which they can engage in strategic initiatives vis-à-vis the firm.

With respect to the nature of these external initiatives, the current study, and specifically the analysis presented in Chapter 7, finds that the ecologies of external initiatives that tend to emerge around large, established firms consist of both induced and autonomous initiatives, in the sense that some of the initiatives consist of far-reaching ideas that supersede the boundaries of the focal firm's existing corporate strategy by involving the development of unrelated products that are based on capabilities and technologies that are new to the focal firm, whereas others are constituted by suggestions that are shaped by the focal firm's existing corporate strategy and which can easily be incorporated within the frames of that strategy (Burgelman 1983a,b). However, this study further suggests that *the proportion of autonomous initiatives is higher among the pool of externally developed initiatives* as compared to the internal initiatives, of which the majority can typically be classified as induced.

Notably, the finding that the ecologies of external initiatives are a source of variation, which was stressed in the analysis set forth in

## Chapter 8

Chapter 7, and that they tend to be more autonomous and decoupled from existing corporate strategies than internal ecologies is largely consistent with Regnér's (1999, 2003) finding that people at *the peripheries of organizations* function as an important source of exploration and creativity and that these peripheral actors are more likely to generate autonomous initiatives than people who are closer to the core of the organization. The findings of this study also further corroborate Regnér's (2003) finding that people further away from the center of an organization tend to draw upon *a different set of competencies and technologies* (Prahalad & Hamel 1990), *practices and routines* (Nelson & Winter 1982, Whittington 1996, Regnér 2003), and *cognitions* (Prahalad & Bettis 1986, Walsh 1995), and that these points of divergence tend to produce different outcomes.

To draw on a specific example, it was shown in the study of the creation of the iPod and the iTunes Store within Apple that Tony Fadell's set of capabilities that he had acquired by working with handheld devices and digital media in other companies, and which differed from Apple's core competencies, along with his status as an outsider vis-à-vis Apple (which meant that he was less shaped by dominant ways of thinking within the company), allowed him more easily (than internal actors) to envision the opportunity of Apple transforming itself into a digital music company. On a similar note, the study of DeLaval's entry into the market for milk analysis shows that ChemoMetec, the Danish start-up that initiated the creation of the DeLaval Cell Counter device with which DeLaval entered this market, was built on competencies and technologies that fundamentally differed from DeLaval's own core competencies and technologies, which enabled it to identify an opportunity that had not been discerned by actors within DeLaval and which deviated from DeLaval's then-current corporate strategy.

★ ★ ★

In sum, based on this discussion, it can be concluded that the external ecologies of strategic initiatives that arise in the vicinity of large, established firms represent an additional, and previously unrecognized, source of raw material for internal strategic initiatives that may ultimately drive the creation of new strategies. In terms of gauging the overall contribution to the literature, it can be concluded that the current study *adds the external dimension to the analysis of strategic*

*initiatives* and hence suggests that the future analysis of strategic change in large, established firms should also take into account ecologies of external strategic initiatives.

### **8.3.2 Managing the external context**

Having suggested the existence and delineated the impact of external strategic initiatives in the strategy creation processes of large, established firms in the previous section, in this section I will discuss the extent to which firms can influence the emergence of external strategic initiatives, and thereby outline the role of strategic choice with respect to the external drivers of new strategies (Child 1997). Previous literature about the strategy process in large, complex firms asserts that even though this process is difficult to control, specifically with respect to autonomous strategic behavior, it can be influenced by actors at the higher echelons of the firm by *managing the context* in which new strategic initiatives are created, evaluated, and selected (Burgelman 1983c, Regnér 1999, Lovas & Ghoshal 2000). For instance, in a context where both the formal structure and the organizational culture support and reward autonomous strategic initiatives (Hill & Rothaermel 2003), the probability that major changes in corporate strategy will be enacted is higher than in a context where only induced strategic behavior is rewarded and autonomous initiatives are dismissed by the firm's selection system (Czernich 2004).

This study extends these insights about the indirect ways through which strategy creation can be influenced by pointing to a previously overlooked mechanism for manipulating a firm's strategy context. Based on the findings discussed in the previous section about ways in which external strategic initiatives impact strategy creation in firms, I argue here that the strategy creation process can be influenced not only by managing the internal context and thereby the internal creation of strategic initiatives, but also by *managing the external context* and thereby the creation of external strategic initiatives. The findings of this study show that whereas the emergence of external initiatives does lie outside of the direct control of the focal firm, the external actors who engage in strategic behavior vis-à-vis the focal firm tend to be *susceptible to influence from the firm*. As shown in previous chapters, a certain set of behaviors with respect to how the firm communicates its future strategies and innovation projects, tend to influence the types of external initiatives that are

## Chapter 8

attracted. As illustrated in Figure 8.3, this study points to the existence of a previously unrecognized *feedback loop* between how the firm communicates its corporate strategy and the types of external strategic initiatives that emerge in the environment around the firm.

Specifically, the current study suggests that firms face a trade-off between trying to impose existing corporate strategies onto the community of external innovators and thereby seeking to control external innovation activity as much as possible, or attempting to stimulate autonomous external initiatives that fall outside of current strategy. The case findings show that if a firm displays little variation in the way it presents itself by keeping *tightly centralized control over communication and projecting a narrow corporate strategy* that is closely linked to its existing product areas and technologies, the inflow of externally developed ideas and innovation will also contain relatively little variation and will likely be limited to the firm's existing product areas and technologies, and therefore will primarily support the exploitation of existing strengths. Conversely, the analysis shows that if a firm projects *a broader and more multifaceted corporate strategy* that is less tightly linked to the firm's existing product, the inflow of externally developed ideas and inventions will be more diverse and will contain a larger degree of variation, and will hence support the exploration of new opportunities to a larger extent (March 1991).

In other words, the analysis suggests that firms face a trade-off between (i) *projecting a monolithic corporate strategy and identity* that promotes an inflow of externally developed ideas and inventions that are closely related to existing product areas and technologies and which are congruent with the firm's existing strategies, and (ii) *projecting a multifaceted corporate strategy and identity* that promotes a diverse inflow of the sort that reaches beyond the firm's existing product areas and technologies and may not necessarily be congruent with the firm's existing strategies. In the case companies, distinctly different behaviors with respect to these ideational dimensions of firm behavior can be observed. Whereas Autoliv projects a highly monolithic corporate strategy that is tightly linked to its existing product areas, it is clear that the creation of Ericsson Multimedia as an independent business unit within Ericsson represented a deliberate effort to promote a more multifaceted corporate strategy, and thereby to invite a broader range of external strategic initiatives.

★ ★ ★

### *Attraction: A new driver of learning and innovation*

In sum, this section points to a previously under-recognized link between a firm's outward appearance in terms of how it presents its corporate strategy and the outcomes of its strategy creation process. This serves to explicate an additional mechanism through which top management can guide the strategy creation process in their firms indirectly, as the study shows how a firm's outward presentation of its corporate strategy influences the ecology of external strategic initiatives that emerge around the firm and which constitutes a source of inspiration and raw material for new strategies in the focal firm.

Altogether, the identification of these extensions to Burgelman's (1983b) model is posited to offer additional insights and thereby to extend the existing theories pertaining to the process of strategy creation in large, complex firms and the methods by which a firm's managers can manipulate the strategy creation process.

## **8.4 Managerial implications**

After having discussed the theoretical implications of the findings, in this section I will formulate a set of managerial implications to outline how the study can inform practicing managers. Notably, the following section will provide recommendations both to firms that want to attract external impulses and to firms that seek to approach established firms to present them with new ideas and inventions.

### **8.4.1 Assess the need for external impulses**

The case findings show that many companies take an *ad hoc approach to attraction*, in the sense that they neither engage in attraction-enhancing activities, nor have any systematic procedures for the reception and evaluation of external impulses. I argue that whereas a passive approach may be appropriate for some firms, in many cases, firms fail to take full advantage of the attraction mechanism. I hence suggest that firms should carefully evaluate their approach to attraction and make a conscious decision about how to best leverage it. Importantly, however, the study does not suggest that all firms should dedicate significant resources to building attraction, as the findings show that attraction is not equally useful for all firms. Instead, *a contingency approach* is advocated, whereby the factors that increase or decrease the relevance of attraction should determine how



## Chapter 8

much effort is allocated to stimulating inflows of external ideas and inventions.

The case analysis suggests that firms that are active in *complex and turbulent strategic contexts* are well advised to ensure that they attract a substantial inflow of external impulses, since this will help them make sense of market dynamics and technological developments, which in turn will support their strategic decision-making. It further demonstrates that firms with a *heterogeneous customer base and a diverse product portfolio* should seek to stimulate an inflow of external impulses, since such firms typically struggle to be perfectly in tune with the needs of all of their customers and therefore can be helped significantly by attracting impulses from external actors that are specialized in specific customer segments. The findings further suggest that firms that have *recently entered a new product area* should seek to build attraction, since such firms, due to their newness, typically have not yet developed superior internal capabilities, which means that they can be aided by attracting external ideas and inventions. Finally, firms that pursue strategies committed to aggressively growing into new product areas are recommended to build attraction, since external impulses often revolve around product ideas that diverge from the recipient firms' existing product portfolios, thus providing opportunities to diversify into new product areas.

### 8.4.2 Stimulate the external inflow and compete to attract the best ideas

Firms that meet one or several of these criteria are consequently recommended to actively work to build attraction and stimulate inflows of externally developed ideas and inventions. In response to this general advice, the study also offers a set of specific recommendations for how this can be achieved.

First, the study recommends that firms seek to maximize the chances that external actors are able to identify ways of combining their ideas and inventions with the resources and capabilities of the focal firm. In other words, a firm should work to *facilitate* the process by which external actors identify *combinatorial opportunities* between themselves and the focal firm. The study suggests that this can be achieved through *increased openness and transparency* in terms of the focal firm *selectively revealing information about its resource base, its current innovation projects, and its future strategies*. The logic behind this recommendation is that revealing such information enables

*Attraction: A new driver of learning and innovation*

external actors to get a better understanding of how their ideas and inventions could be combined with the firm's resources and how they might fit into its innovation projects and future strategies.

Having said this, it is important to stress that any such attraction-related benefits of sharing information need to be weighed against the possible detrimental effects in terms of revealing trade secrets and weakening the firm's protection of its intellectual property. However, despite this caveat, I suggest that *firms should reveal more information about their innovation and future strategies than what conventional wisdom suggests*. In effect, I argue that because the received knowledge about the optimal degree of secrecy and openness has neglected the attraction-related benefits associated with openness and revealing information, the received wisdom has typically called for too much secrecy and too little openness compared to what is actually optimal for firms.

Second, based on the findings, I recommend that firms *actively compete for the best ideas* by working to make themselves *the preferred choice* among external innovators when these are seeking a partner to commercialize new ideas or inventions. The study suggests that this can be achieved by building a strong *innovation brand*. Analogous to how a traditional brand seeks to make a firm attractive to potential customers, an 'innovation brand' is intended to make a firm attractive among external innovators. The findings suggest that building an innovation brand entails several different components.

First, it is recommended that firms should seek to cultivate a reputation of being *trustworthy and receptive to external impulses*. This may include making targeted investments in certain external ideas or inventions in order to signal to the community of external actors that the firm is "open for business." It further entails ensuring that external impulse providers receive a swift and professional response each time they contact the company with a new idea.

Second, building a strong innovation brand also includes establishing *leadership in people's perceptions* in key areas that the focal firm has identified as interesting. Becoming perceived as the innovation leader within an area will tend to increase external innovators' willingness to approach the focal firm and will give it an advantage over other firms in the competition to attract the best ideas and inventions. In order to establish such perceived leadership, the study of Draper Fisher Jurvetson shows that it is essential *early on to communicate an interest in the area as it is starting emerge*. This entails en-

gaging in the public discussion, in terms of media appearances by company managers and the participation at conferences and trade shows, even before the firm has in fact established a market presence or acquired a sophisticated expertise in the area, in order early on to associate the firm with the emerging area in the minds of external actors, so that external innovators will be inclined to approach the firm when they seek a partner to commercialize their ideas and inventions within that particular field.

#### 8.4.3 Build multifaceted attraction

Importantly, the fact that certain firms are recommended to take a more active approach to attraction does *not* imply that the top management of firms are advised to take a more centralized control over the attraction process. Instead, it is contended here that in order to make the best use of the attraction mechanism, attraction should be *a decentralized process*, whereby *multiple people and units* within the firm engage in attraction-enhancing activities. The rationale behind this recommendation is that *different people will tend to attract different impulses*. This means that by allowing multiple actors within the firm to engage in attraction-enhancing activities, the attraction that the firm exerts becomes more *multifaceted*, enabling the firm to *cast a wider net* by appealing to a broader group of innovators, which ultimately increases the chances that the firm will attract valuable ideas or inventions.

Concretely, this means that not only top managers, such as the heads of R&D, should be allowed to communicate about the firm's innovation efforts, but that also other, lower-level actors should contribute to making the firm's innovation projects visible to external innovators. It further means that the communication of a firm's corporate strategy should not necessarily be the prerogative of a small number of top managers, since this will typically lead to that a narrow depiction of the firm's strategy is conveyed that is closely related to the firm's existing product areas. Instead, it is suggested here that in order to attract a broad array of external strategic initiatives, it is fruitful to let multiple actors within the firm communicate the firm's strategy, and hence thereby to allow for a certain amount of *experimentation* in terms of the way the firm presents its strategy.

Altogether, it is argued here that such a decentralized approach to how a firm presents itself and makes its innovation projects and

### *Attraction: A new driver of learning and innovation*

strategies visible, may lead to that unexpected, and value-creating combinations will be identified by external actors from distant context between their ideas and resources and the resources, capabilities, and strategies of the focal firm, such as when firms from other industries realize that their existing technologies can be put to use by the focal firm in its industry.

#### **8.4.4 Use meetings with impulse providers as learning opportunities**

Further, it is recommended that when managers evaluate the benefits of attracting external impulses, they should consider more than just the effects of the ideas and inventions that are adopted and commercialized, as the findings suggest that the pool of impulses that are not adopted also often contains valuable information and knowledge. In effect, in each meeting with an impulse provider, the manager at the recipient firm gets the opportunity to interact, free of charge, with someone who is typically an expert within a specific field that is related to the recipient firm's business. This means that even if the proposition as such is not relevant, there is usually potentially important information or knowledge to be gained by carefully listening and discussing the proposition. The recommendation for managers, based on this study, is to treat the meetings with external impulse providers as *sources of information and opportunities for learning*.

In addition, it is recommended that firms should not only be attentive to the content of the external impulses that the firm attracts, but also to *the inflow as such*. The study demonstrates that the inflow contains important information in the way it fluctuates over time and how the impulses are distributed with respect to the product areas and technologies that they target. For instance, if the inflow of external impulses starts to decline, this may represent a signal that some change has occurred that the firm needs to heed. The change may represent either a *warning signal* that the community of external innovators is losing their confidence in the firm's future prospects, or an indication that the field is becoming more mature and consolidated, thereby reducing the level of new ideas and innovations that emerge in the field, either of which should compel the firm to further investigate these changes. In addition, the study suggests that firms should take note of the product areas and technology domains within which it attracts the greatest number of external impulses. If a number of these external impulses centre around a certain type of new

product that the firm has not yet invested in, this may indicate that this represents an emerging product area that is about to “take off” and that the firm should consider investing in.

#### 8.4.5 Recommendations to impulse providers

Finally, as the study delineates the conditions under which external impulses are more likely to be of value to the recipient firms, and thereby more likely to get adopted, the study can also offer recommendations to innovators by informing them about the type of circumstances under which they might have the greatest chances of successfully “pitching” their ideas or inventions to established firms. Significantly, the study identifies *a common mistake* that many impulse providers make when they approach large, established firms, which is that they target the recipient firms’ mature, core product areas in which the firms are *already highly knowledgeable and capable*.

The study for instance shows that a large proportion of the impulses that DeLaval attracts are directly related to milking systems, which is DeLaval’s core product area. Likewise, a large share of the impulses that Autoliv attracts relates to seat belts, which is an area within which Autoliv, through large investments in R&D, has developed a highly sophisticated internal expertise. The study demonstrates that external impulses rarely get adopted in the recipient firms’ core areas because the recipient firms’ strong internal capabilities in these areas tend to put the external innovators at a disadvantage, and because the recipient firms tend to have already picked the “low-hanging fruit” in these areas, making it less likely that an external actor will be able to come up with a genuinely valuable opportunity.

Taken together, this suggests that external innovators should avoid presenting ideas and inventions that fall within the recipient firms’ core product areas. Instead, impulse providers should look for one of the two following things:

- 1) Product areas or technological areas that the recipient firm has recently entered and therefore has not yet had the time to develop expertise. In such areas, there is a higher probability that the knowledge that is held by the impulse provider can add value to recipient firm, and hence that the impulse will be adopted. As an example, the study recounts that when Ericsson Multimedia started developing

IPTV systems, the company was aided substantially by the inflow of external impulses and adopted several of these impulses.

2) Product areas which lie outside of the recipient firm's core competencies, but which still are of interest to the firm, as they provide additional revenues or support the sales of its core products. The study shows that DeLaval's aftermarket product area is one such example where the company frequently adopts external impulses, because they can benefit from the expertise of external actors in areas within which the firm lacks a specialized internal expertise.

## **8.5 Limitations**

After having presented the conclusions of the study and its theoretical and managerial implications, it is also important to again note that the conclusions are subject to the same type of limitations as is all research that is based on a small number of cases. As discussed in earlier chapters, external validity is always a challenging issue in case study research, since the sample sizes are typically not large enough to allow for statistical generalization (Yin 1989). This study is based on three case companies in the main study and four companies in the pilot study, which represents a limited number of cases. This suggests that a certain measure of restraint is warranted when generalizing based on the study's findings. In particular, since all the companies originate in two countries, Sweden and the U.S., certain caution is warranted with respect to the possibility that attraction might play out differently in different institutional and cultural contexts. Hence, it would be valuable for future studies to replicate the findings in other settings, in order to verify if the findings presented in this study are robust across different contexts.

In addition, the study's heavy reliance on interview-based accounts of key respondents calls for certain caution when interpreting the results. Arguably, the use of interviews is both a strength and a weakness; it may be considered a strength because close access, based on direct interaction with knowledgeable respondents, is considered to be a primary way of accessing information about complex processes within companies (Eisenhardt & Graebner 2007). However, this argument presumes that the respondents are able and willing to provide accurate information. Clearly, this cannot be taken for granted, and the information that is obtained from an interview

## Chapter 8

should not be accepted at face value as there is always the risk that the respondents are ill-informed about the subject matter and therefore provide inaccurate information (Miller et al. 1997).

As argued previously, this problem was addressed in this study by carefully selecting the best-informed respondents in the case companies and by interviewing multiple respondents at *different hierarchical levels* from both *within* and *outside* the case companies and then *triangulating* the respondents' accounts, which according to Eisenhardt & Graebner's (2007) are potent ways of ameliorating such problems. However, despite these measures, the possible risk that the validity is compromised by certain shared misperceptions among the respondents, such as, for instance, a systematic tendency among the respondents to under- or overestimate the significance of the attraction of external impulses, cannot entirely be ruled out. As a consequence, a future study that uses methods other than interviews would potentially be valuable in order to verify the findings that have been obtained from this study.

★ ★ ★

Finally, after having presented the theoretical and managerial implications of the findings of the study and having discussed some of the study's limitations, the thesis will be concluded in the next section where some of the core findings of study will be briefly revisited.

### 8.6 Concluding remarks

What is it that makes a firm skilled at innovating and exploring new opportunities, and ultimately successful at renewing the basis of its competitive advantage? The current study offers an answer to this question that diverges to some degree from the explanations that have been advanced in the extant literature. This study finds that a firm's capacity to learn, innovate and identify new opportunities is determined not only by its own *internal capabilities* with respect to innovation and opportunity recognition, but also by how the firm is *perceived by external actors in its environment*, as this determines what new impulses it becomes exposed to as a result of external actors approaching the firm to present it with new ideas and inventions that they want to commercialize in cooperation with the firm. The

*Attraction: A new driver of learning and innovation*

study shows that the impulses that firms attract from the outside environment can constitute an important *source of raw material and complementary capabilities* around which they innovate and from where they select their future products, technologies, and strategies; factors that enable the firms to upgrade their resource bases and renew their product portfolios and ultimately to sustain their competitiveness.

As such, this study *redirects the locus of explanation* from the focal firm's internal capabilities to the perceptions and opportunity recognition of external innovators in the environment around the focal firm. This is a shift that is driven by the finding that the way a focal firm innovates, collects information about its external environment and searches for opportunities, i.e., from "the inside looking out," is not the only determinant of a firm's ability to benefit from new opportunities. Rather, the way that external actors perceive the focal firm, i.e., from "the outside looking in," and specifically, the extent to which external innovators identify ways of combining their ideas and inventions with the focal firm's resources and capabilities, can also profoundly influence a firm's access to new opportunities. In other words, the thesis demonstrates that a firm's innovativeness and its ability to access to new opportunities are determined not only by how "smart" and perceptive a firm and its managers are, but also by how attractive the firm is to external innovators.

Specifically, the study demonstrates that attracting external ideas and inventions represents a means through which firms can *reach beyond their own search and innovation routines and their established ways of thinking*. Further, attracting impulses from a diverse group of external actors tends to place a firm in a *favorable position to pursue radical innovation and to explore opportunities to grow into new product areas*. In essence, the benefits associated with attraction are succinctly captured by Lior Yaron, Director of Global Customer Project Support at DeLaval, who states that:

"We have the advantage in that every crazy guy in the industry comes to us first when they have a new idea."



## **Appendix A**

### **Sources for the pilot study**

## **Appendix A.1 Sources for Yamaha**

### Interviews:

John Chowning, Professor Emeritus at Stanford University and inventor of FM synthesis, September 2007.

Jon Sandelin, Senior Associate Emeritus at Stanford University Office of Technology Licensing, May 2007.

### Secondary sources:

Chaiken, A. (2006) Interview with composer and electronic music pioneer John Chowning, Available online: [http://en.wikipedia.org/wiki/File:JohnChowning041306\\_part1.ogg](http://en.wikipedia.org/wiki/File:JohnChowning041306_part1.ogg) (Retrieved 2009-11-07).

Chowning, J. (1973) The Synthesis of Complex Audio Spectra by Means of Frequency Modulation, *Journal of the Audio Engineering Society*, Vol. 21 (7).

Johnstone, B. (1999) *We were burning: Japanese entrepreneurs and the forging of the electronic age*, NY: Basic Books.

Nelson, A. (2004) Cacophony or harmony: Multivocal logics in and technology licensing by the Stanford University, *Industrial and corporate change*, Vol. 14 (1).

Lehrman, P. (2005), A talk with John Chowning, *Mix Magazine*, 1 March.

Darter, T. (year unknown) An Exclusive Interview with the Father of Digital FM Synthesis, *Aftertouch Magazine*. Vol. 1 (2).

Stanford Technology Ventures Program (1998) Stanford Office of Technology Licensing (OTL) A: Crossroads in the Yamaha Alliance. STVP – 1998-008.

## Appendix A

### Appendix A.2 Sources for Apple

- Apple (2008a) *Annual Report 2008*, Available online: [http://library.-corporate-ir.net/library/10/107/107357/items/315133/AAPL\\_-10K\\_FY08.pdf](http://library.-corporate-ir.net/library/10/107/107357/items/315133/AAPL_-10K_FY08.pdf) (Retrieved 2009-11-07).
- Apple (2008b) iTunes Store Top Music Retailer in the US, Press release, Available online: <http://www.apple.com/pr/library/2008-/04/03itunes.html> (Retrieved 2009-11-07).
- Burgelman, R. & Grove, A. (2007) Cross-Boundary Disruptors: Powerful Inter-Industry Entrepreneurial Change Agents, Research Paper No. 1978, Stanford Graduate School of Business.
- Coff, R. (2009) The Co-evolution of Rent Appropriation and Capability Development, Conference Paper, Druid Copenhagen Business School.
- Elmer-Devitt, P. (2008) How to grow the iPod as the MP3 market shrinks, *Fortune*, 29 January.
- Evangelista, B. (2002) Napster runs out of lives – Judge rules against sale, *San Francisco Chronicle*, 4 September.
- Hormby, T & Knight, B. (2005), A history of the iPod 2000-2004, *Tom Hormby's Orchard*, Available online: <http://lowendmac.com-/orchard/05/origin-of-the-ipod.html#0> (Retrieved 2009-11-07).
- Kahney, L. (2004) Inside Look at Birth of the iPod, *Wired*, 21 July.
- Kahney, L. (2005) *The cult of the iPod*, San Francisco: No Starch Press.
- Kahney, L. (2006), Straight Dope on the iPod's Birth, *Wired*, 17 October.
- Kelly, K. (2007) Case Study: The Development of the iPod, In Sexton, J. (ed), *Music, Sound, and Multimedia: From the Live to the Virtual*, Edinburgh: Edinburgh University Press.
- Lovallo, D. & Mendonca, L. (2007) Strategy's strategist: An interview with Richard Rumelt, *McKinsey Quarterly*, November.
- Markoff, J. (2004) Oh, Yeah, He Also Sells computers, *NY Times*, 25 April.

*Attraction: A new driver of learning and innovation*

Menn, J. (2003) Steal this record and millions like it, *San Francisco Chronicle*, 27 April.

Sherman, E. (2002) Inside the Apple iPod Design Triumph, *Electronic Design Chain*, Vol. 1 (Summer Issue).

Walker, R. (2003) The Guts of a New Machine, *NY Times*, 30 November.

## Appendix A

### Appendix A.3 Sources for Draper Fisher Jurvetson (DFJ)

- Austin, S. (2009) The importance of “crazy ideas” to a successful VC firm, *Wall Street Journal*, 9 October.
- Calvey, D (2001) Jurvetson pins big hops on tiny nanomachines, *San Francisco Business Times*, 13 July.
- Iwata, E. (2008) Venture-capital firm transforms global start-ups, *USA Today*, 9 October.
- Jurvetson, S. (2007) DFJ’s search for innovation, Presentation at Stanford University, September 2007.
- Kanellos, M. (2005) The big winner behind Skype and Baidu, *CNET News*, 15 September.
- Kanellos, M. (2004) Steve Jurvetson says nanotech will tap nature’s potential, *CNET News*, 24 August.
- Needleman, R. (2009) Steve Jurvetson: Only investing in the unknown, *CNET News*, 6 July.
- Pogue, D. (2005) Explaining Nanotechnology, *NY Times*, 3 February.
- Stanford University’s Entrepreneurship Corner, Available online: <http://e-corner.stanford.edu/authorMaterialInfo.html?author=20> (Retrieved 2009-11-07).
- Takahashi, D. (2008) Steve Jurvetson on focusing on clean-tech during the economic storm, *Deals & More*, 18 December.
- TED (2007) Steve Jurvetson on model rocketry, Available online: [http://www.ted.com/talks/steve\\_jurvetson\\_on\\_model\\_rocketry.html](http://www.ted.com/talks/steve_jurvetson_on_model_rocketry.html). (Retrieved 2009-11-07).
- Thayer, A. (2005) Nanotech Investing, *Chemical & Engineering News*, 2 May.
- The J Curve. Available online: <http://jurvetson.blogspot.com/> (Retrieved 2009-11-07).
- Waters, R. (2005) Why nanotechnology is next big thing, *Financial Times*, 29 March.

#### **Appendix A.4 Sources for Procter & Gamble (P&G)**

- Coomber, S. (2007) P&G and New Models of Innovation, *In View*, Issue 12, January.
- Brady, D. (2008) Interview with Mark Petersen, Director External Business Development at P&G, Available online: <http://feedroom.businessweek.com> (Retrieved 2009-11-07).
- Dodgson, M., Gann, D. & Salter, A. (2006) The role of technology in the shift towards open innovation: the case of Procter & Gamble, *R&D Management*, Vol. 36 (3).
- Hof. R.D. (2004) At P&G, It's 360-Degree Innovation, *BusinessWeek*, 11 October.
- Holthaus, D. (2009) P&G spreads idea net, *Cincinnati inquirer*, 13 January.
- Huston, L. & Sakkab, N. (2006) P&G's New Innovation Model, *Harvard Business Review*, March.
- Knowledge&Wharton (2007) Innovation Networks: Looking for Ideas Outside of the Company, 14 November.
- Lafley, A.G. (2008) P&G's Innovation Culture, *enews strategy+business*, 26 August.
- McGregor, J. (2007) P&G asks: What's the Big Idea, *BusinessWeek*, 4 May.
- Procter & Gamble (2010) *Annual Report 2009*, Available online: <http://www.pg.com/annualreport2009/financials/index.shtml>.
- P&G.com (2008) Interview with Jeff Leroy, Available online: [http://www.pg.com/company/connect\\_develop.shtml](http://www.pg.com/company/connect_develop.shtml) (Retrieved 2009-11-07).
- Research-Technology Management (2007) Implementing Open Innovation: RTM interviews Larry Huston and Nabil Sakkab, March-April.
- Staggs, S. (2008) Connect + Develop with P&G: An interview with Jeff Weedman. *IdeaConnection*, 20 November.
- Teresko, J. (2004) Technology Leader of the Year – P&G's Secret: Innovating Innovation, *Industryweek*, 1 December.

## **Appendix B**

### **Sources for the main study**

## Appendix B.1 Sources for DeLaval

### Interviews:

Respondent	Company	Position	Interview time (minutes)
Uzi Birk	DeLaval	Senior Technical Director, Research & Innovation	150
Ole Lind	DeLaval	Director, Research & Innovation	150
Hans Holmgren	DeLaval	Director, Research & Innovation	120
Lior Yaron	DeLaval	Director, Global Customer Project Support	60
Göran Karlsson	DeLaval	Director of Product Portfolio, Barn Equipment and Farm Supply	60
Tor Bratland	DeLaval	Director of Product Portfolio, Tied-Up Milking Systems and Supply	80
Otto Hellekant	DeLaval	Manager Mechanical Engineering	70
Axel Elfgrén	DeLaval	Service Coach	80
Stefan Bergstrand	DeLaval	Dairy Expert	90
Torbjörn Petterson	DeLaval	Senior Specialist Milk Extraction	90
Karin Östensson	Swedish University of Agricultural Sciences	Lecturer	60
Frans Ravn	ChemoMetec	Founder	30
Staffan Bohman	Formerly DeLaval	Former CEO of DeLaval	30

### Secondary sources:

DeLaval (2009) Corporate Presentation 2008/2009, Available online: [http://www.tetralaval.com/SiteCollectionDocuments/TLA\\_2009\\_DeLaval.pdf](http://www.tetralaval.com/SiteCollectionDocuments/TLA_2009_DeLaval.pdf).

DeLaval (2010) DeLaval kopplar Herd Navigator till VMS, Press release, 10 June.

DeLaval (2010) Smart teknologi säkerställer gårdens lönsamhet, Press release, 16 February.

DeLaval (2005) DeLaval utvecklar nytt koncept för Automatisk Mjölkning för Australien, Press release, 7 September.

DeLaval (2005) Pris för bästa tekniska uppfinning till DeLaval celltalsmätare DCC, Press release, 1 July.



## Appendix B

- Doz, Y, & Dalsace, M.A. (2000) Alfa Laval Agri (A), (B), (C), INSEAD Business Case.
- Kinander, K. (2010) Sensorer och system i mjölk Kobesättningar: en litteraturstudie, Bachelor Thesis, Swedish University of Agricultural Sciences.
- Lattec (2007) Pro-active Herd Management - A Brief Status, Presentation at ICAR General Assembly.
- Mills, R. (2008) On-farm analysis – An eye on the future, *In Focus*, Vol. 32 (1).
- Ravn, F. & Glensbjerg, M. (1997) A method and a system for determination of particles in a liquid sample, C12Q1/06; G01N15/02; G01N15/06.
- Ravn, F. & Glensbjerg, M. (1997) A method and a system for determination of biological particles in a liquid sample, G01N15/14; G01N15/14.
- Åman, P. (2003) *Revolution by Evolution – Transforming international management in the established MNC*, Published Doctoral Dissertation, Stockholm: Institute of International Business.

## Appendix B.2 Sources for Autoliv

### Interviews:

Respondent	Company	Position	Interview time (minutes)
Henrik Kaar	Autoliv	Director of Corporate Communication	120
Jan Olsson	Autoliv	Vice President of Research	60
Sture Andersson	Formerly Autoliv	Former Vice President of Engineering	90
Mathias Johansson	Gabria AB	Founder	30
Ulf Elman	Sensice	Founder	45
Sten Löfving	Optical Sensors	Founder	45
Bo Swedenklef		Independent inventor	60
Anders Bruzelius	Swedbank	Head of Equity Research	60
Lotta Jacobsson	Volvo Cars	Biomechanics and technical specialist	45
Björn Frenell	Independent Inventor		45
Björn Lundell	Volvo Cars	Construction specialist	45
Hugo Mellander	Traffic safety research & Engineering	CEO	60
Mats Lindquist	Saab	Car Safety Specialist	60
Maria Krafft	Folksam	Head of Safety Research	45
Anders Lie	Swedish Road Administration	Traffic Safety Specialist	45
Claes Tingwall	Swedish Road Administration	Director of Traffic Safety	30

### Secondary sources:

Autoliv (2009) *Annual Report 2008*, Available online: [http://www.ion.se/autoliv/Autoliv\\_AR2008.pdf](http://www.ion.se/autoliv/Autoliv_AR2008.pdf) (Retrieved 2009-11-09).

Autoliv (2008) Autoliv assists Volvo to be top-rated for whiplash protection, Press release, 2 December.

Autoliv (2008) Autoliv Launches Second Generation Night Vision with Pedestrian Detection, Press release, 2 October.

## Appendix B

- Carlsson, J. (2007) Capital Market Presentation Autoliv, 29 August.
- Eriksson, L. (1996) Autoliv tror på Swedenklefs bilstol, *Ny Teknik*, 14 March.
- Johansson, N. (2007) Personporträtt: Jan Carlsson – För säkerhets skull, *Veckans Affärer*, 22 November.
- Karlberg, P., Malm, C., Smolak, D. & Väcklén, S, (2007) The S-curse – En fallstudie av Autoliv, Master Thesis, Lund University.
- Lundell, B., Jakobsson, L., Alfredsson, B., Lindström, M., Simonsson, L. (1998) The WHIPS Seat – A Car Seat for Improved Protection Against Neck Injuries in Rear Impacts, 16th ESV Conference. Paper no. 98-S7-O-08.
- Regné, P. (1999) Strategy Creation and Change in Complexity – Adaptive and Creative Learning Dynamics in the Firm, Published doctoral dissertation, Stockholm: Institute of International Business.
- Sandberg Ericsson, K.E. & Hervik, A. (2004) Effektanalys av nackskadeforskning vid Chalmers. Sammanfattning, Vinnova Case No: 2004-00608.
- Sportinformation (2008) Volvos pisksnärtssystem firar 10 år, 12 December.
- Swedenklef, B. (1995) Stol för persontransport, C2 512722..
- Swedenklef, B. (1995) Stol med parallellstag för persontransport, C2 512723.
- Swedenklef, B. (1995) Stol med aktivt ryggstöd, C2 513122.
- Swärd, L. (1995) Småföretag tävlar med Autoliv, *Svenska Dagbladet*, 13 December.
- Swärd, L. (1995) Autoliv växer genom köp, *Svenska Dagbladet*, 14 December.
- Wahlström, M. (1995) Hans bil stoppar nackskadorna, *Ny teknik*, 30 November.

## Appendix B.3 Sources for Ericsson Multimedia

### Interviews:

Respondent	Company	Position	Interview time (minutes)
Dan Fahrman	Ericsson Multimedia	Senior Advisor	90
Pär Karlsson	Ericsson Multimedia	Manager, Ericsson Consumer lab	60
Mark Jefford-Baker	Ericsson Multimedia	Manager Business development	75
Martin Körling	Ericsson Research	Director, Ericsson Research	60
Peter Gregefors	Ericsson Multimedia	Business development, Acquisitions	120
Rickard Brorsson	Ericsson	Head of Global Change	60
Dmitry Maselsky	Ericsson	Director, Group Strategy	120
Bernt-Eije Peterson	Ericsson Multimedia	Development Manager	60
Torbjörn Nilsson	Ericsson	Former Senior Vice President Strategy	120
Jörgen Odgaard	Ericsson Multimedia	Former Director of Ericsson Developer Connection	120
Henrik Ericsson	Ericsson Multimedia	Strategic Product Manager	30
Jörgen Lantto	Ericsson Multimedia	Research Director	40
Staffan Ljung	Ericsson Multimedia	Head of Music and Entertainment Solutions	30
Jöran Hoff	Formerly Ericsson	Former Director of Ericsson Business Innovation	60
Ulf Wahlberg	Ericsson	Research Director, Ericsson	30
Mårten Wesslén	Ericsson Multimedia	Strategic Product Manager	120
Fredrik Andersson	Accedo	COO	120
Helena Nordman-Knutsson	Öhman	Financial Analyst	60
Per Ekstrand	Kauping	Financial Analyst	60
Greger Johansson	Redeye	Head of Equity Research	60
Torbjörn Carlbom	Veckans affärer	Journalist	120
Tomas Bennich	Kista Mobile Showcase	Project Manager	60
Oskar Fajerson	Carmenta	VP Sales	70
Niklas Sjöberg	Mozoomi	CEO	60

## Appendix B

Christina Sundman	Mobilechallenger	CEO	70
Cesar Albiz	Tritelum	Owner	50
Anna Caracolias	Adimo	CEO	60
Maria Christensen	CEO	Mobizoft	60
Karl Bohman	Mondozer	CEO	70
Mia Sandell	Qbrick	Mobile Manager	90
Magnus Fagerholm	Pharmtech	CEO	70
Agneta Wistrand	Kiwok	CEO	60
Dusyant Patel	Mobispine	CEO	60
Venture capitalist	(Name withheld)		90
Fredrik Nyström	Plusfoursix	Creative Director	60
Henrik von Schultz	Mobile Sorcery	Business Manager	60
Per Leine	Extransit	CTO	60
Fredrik Backner	TeliaSonera	Director of Product Management	60
Tomas Olsson	Telenor	New Business	60
Andreas Cedborg	3	Head of Innovation	60

### Secondary sources:

Ahlbom, H. (2007) Det här är Ericsson Multimedia, *Ny Teknik*, 18 April.

Badulescu, C., Greene, N, Gustavsson, Å., Jaramillo, C., LeClerc, M., Postmus, P., Saavedra, G. & Servant, M. (2008) Delivering the optimal end-user experience: Ericsson Multimedia Communication Suite, *Ericsson Review*, No. 2.

Berg, M. (2006) Ericssonchef spår multimediaboom, *Privata Affärer*, 27 September.

Broadband Services Forum (2008) IPTV Explained. Part 1 in a BSF Series. Available online: <http://www.broadbandservicesforum.org/images/Pages/IPTV%20Explained.pdf> (Retrieved 2009-11-09).

Callahn, D. & Hermansson, H. (2009) Ericsson Research – 10 years of shaping change, *Ericsson Review*, No. 1.

Carlander, M.T. & Olander, J. (2008) Service delivery platforms for the multimedia marketplace, *Ericsson Review*, No. 2.

*Attraction: A new driver of learning and innovation*

- Carlbohm, T. (2007) Personporträtt: Jan Wäreby – Ericssons framtidshopp, *Veckans affärer*, 8 November.
- Cooper, W. & Lovelace, G. (2006) IPTV Guide – Delivering audio and video over broadband. Lovelace Consulting. Available online: <http://www.broadbandservicesforum.org/images/Pages/IPTV%20Explained.pdf> (Retrieved 2009-11-09).
- Ericsson (2006) Ericsson tar ännu ett steg för att utöka sitt ledarskap och marknadsställning, Press release, 15 September.
- Ericsson (2006) Ericsson utser Jan Wäreby till Senior Vice President och chef för affärsområdet Multimedia, Press release, 18 September.
- Ericsson Multimedia (2007) Business Innovation Process, Internal Document.
- Ericsson (2008) Ericsson IPTV Multimedia Solution - Commercial Solutions description, Internal Document.
- Ericsson (2009) *Annual Report 2008*, Available online: [http://www.ericsson.com/ericsson/investors/financial\\_reports/-2008/annual08/sites/default/files/downloads/Complete\\_Annual\\_Report\\_2008\\_EN.pdf](http://www.ericsson.com/ericsson/investors/financial_reports/-2008/annual08/sites/default/files/downloads/Complete_Annual_Report_2008_EN.pdf) (Retrieved 2009-11-09).
- Ericsson (2007) Ericsson Capital Markets Day, 9-10 May.
- Glimstedt, H. (2001) Competitive dynamics of technological standardization: The case of third generation cellular communication, *Industry and Innovation*, Vol. 8 (1).
- Guzman, R. (2008) Ericsson: "Multimedia är inte big-bang", *IT-tjej*, 18 August
- Göteborgsposten (2009) Tv:n på väg in i mobilen – nya medievänor kräver snabbare och snabbare nät, 23 February.
- Hässler, D (2008) Nytt fokus för Ericsson Multimedia, *Realtid.se*, 30 May.
- Minde, T., Timsäter, M., Sandberg, J., Björn, M. & Körling, M. (2009) Ericsson Labs, *Ericsson Review*, No. 2.
- Olsson, U. & Dahlén, L. (2008) Multimedia services overview, *Ericsson Review*, No. 3.

## Appendix B

- Olsson, U. & Stille, M. (2008) Communication Services – The key to IMS service growth, *Ericsson Review*, No. 1.
- Regnér, P. (1999) *Strategy Creation and Change in Complexity – Adaptive and Creative Learning Dynamics in the Firm*, Published doctoral dissertation, Stockholm: Institute of International Business.
- Strandberg, H. (2008) Ericssons snabbväxare ser ingen avmattning, *Dagens Industri*, 10 September.
- Thulin, C. (2009) Jan Wäreby utmanar Apple, *Dagens industri*, 20 August.
- Turina, D., Andersson, O., Wallin, B., Blockstrand, M. & Cagenius, T. (2009) Converged TV, *Ericsson Review*, No 2.
- Wallström, M. (2006) Ericsson massrekryterar och satsar på multimedia, *ComputerSweden*, 17 September.





## **Appendix C**

### **Lists of interview questions**

*Attraction: A new driver of learning and innovation*

**Appendix C.1 Questions to managers of the case companies**

1	What characterizes your industry in terms of innovation?
2	Where do new product ideas and technologies ideas originate in this industry?
3	What trends can you see in term of how product development and innovation is conducted?
4	What are the new opportunities and challenges with respect to innovation?
5	How is R&D and innovation organized in your company? What are the different units involved?
6	How are the new product ideas that your company pursues generated and where do they originate?
7	How does your company stay up to date with recent market development and technological development?
8	Does the company have dedicated units for business intelligence and technology scouting or similar functions?
9	Do external actors come and present ideas for new products or technologies?
10	Why do they approach the company?
11	Who in the company receives the proposals?
12	How are they handled and evaluated?
13	Do you often accept meetings with the impulse providers?
14	How common is it that you adopt such ideas?
15	How is the company impacted by the inflow of external ideas?
16	Is it valuable/important for your company? Why/ Why not?
17	In what product areas is it relatively more important?
18	What kind of ideas and inventions are particularly interesting?
19	Do you try to stimulate the inflow of external ideas and inventions?
20	Do you have formal channels for stimulating and evaluating the inflow of external ideas and inventions?
21	Do you have some examples of interesting things that the company has attracted and which were subsequently adopted?
22	Why were these particular ideas adopted and how did they influence the company?
23	What are the difficulties/challenges associated with using external ideas?

## Appendix C

### Appendix C.2 Questions to external innovators

1	Please give a brief overview of your company.
2	Please describe your existing products and technologies.
3	Please describe how you developed and commercialized the company's existing products.
4	In the process of developing and commercializing your products were there any external actors involved as partners?
5	If so, who were these actors and what were their roles?
6	How was the contact with these actors established?
7	If you initiated the contact, why did you initiate a contact with these particular actors?
8	What did they contribute with in the development and commercialization process? How did your company benefit from the co-operation?
9	How did the external actors benefit from the co-operation?
10	How was the partnership or co-operation organized and structured?
11	During the development and commercialization process were you in contact with other actors that you ultimately did not co-operate with?
12	Why did you contact these particular actors?
13	For the future, how do you seek to develop and commercialize your new product ideas?
14	Do you look for co-operations and partnerships in the development and commercialization process?
15	What determines if you try to develop and commercialize your product ideas on your own or in co-operation with a partner?
16	Have you presented your product ideas to potential partners?
17	If yes, why did you approach these particular actors?
18	What came out of the discussions?
19	Are you planning to approach other companies as potential partners in the development and commercialization process as well?
20	In your experience is it common that firms with new product ideas approach other firms to "pitch" ideas?
21	What are your experiences from pitching ideas to other firms?
22	Are firms generally receptive to adopting external ideas that are presented to them?
23	What are the difficulties/challenges of presenting ideas to other companies related to the development and commercialization process?



# Bibliography

- Ashby, W.R. (1956) *An Introduction to Cybernetics*, New York: Barnes & Noble.
- Ahuja, G. & Lampert, C. (2001) Entrepreneurship in the Large Corporation: A Longitudinal Study of How Established Firms Create Breakthrough Innovations, *Strategic Management Journal*, Vol. 22 (6/7).
- Ahuja, G. & Katila, R. (2004) Where Do Resources Come From? The Role of Idiosyncratic Resources, *Strategic Management Journal*, Vol. 25 (8/9).
- Alvarez, S. & Barney, J. (2001) How Entrepreneurial Firms Can Benefit from Alliances with Large Partners, *Academy of Management Executive*, Vol. 15 (1).
- Ansoff, I. (1980) Strategic Issue Management, *Strategic Management Journal*, Vol. 1 (2).
- Arenius, P. & De Clercq, D. (2005) A Network-based Approach on Opportunity Recognition, *Small Business Economics*, Vol. 24 (3).
- Baldwin, C., Hienerth, C. & von Hippel, E. (2006) How user innovations become commercial products: A theoretical investigation and case study, *Research Policy*, Vol. 35 (9).
- Barney, J. (1986) Strategic Factor Markets: Expectations, Luck and Business Strategy, *Management Science*, 32 (10).
- Barney, J. (1991) Firm Resources and Sustained Competitive Advantage, *Journal of Management*, Vol. 17(1).
- Barr, P.S., Stimpert, J.L. & Huff, A.S. (1992). Cognitive Change, Strategic Action, and Organizational Renewal, *Strategic Management Journal*, Vol. 13 (Special Issue).
- Baum, J., Rowley, T., Shipilov, A. & Chuang, Y. (2005) Dancing with Strangers: Aspiration Performance and the Search for Underwriting Syndicate Partners, *Administrative Science Quarterly*, Vol. 50 (4).

*Attraction: A new driver of learning and innovation*

- Baumol, W.J. (2002) *The Free Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*, Cambridge, Mass.: Princeton University Press.
- Baumol, W.J. (2004) Entrepreneurial Enterprises, Large Established Firms and Other Components of the Free-Market Growth Machine, *Small Business Economics*, Vol. 23 (1).
- Becker, M.C. (2004) Organizational routines: a review of the literature, *Industrial and Corporate Change*, Vol. 13 (4).
- Becker, M.C. (2001) Managing Dispersed Knowledge: Organizational Challenges, Managerial Strategies, and Their Effectiveness, *Journal of Management Studies*, Vol. 38 (7).
- Beckman, C., Haunschild, P. & Phillips, D. (2004) Friends or Strangers? Firm-specific Uncertainty, Market Uncertainty, and Network Partner Selection, *Organization Science*, Vol. 15 (3).
- Bettis, R.A. & Prahalad, C.K. (1995) The Dominant Logic: Retrospective and Extension, *Strategic Management Journal*, Vol. 16 (1).
- Bhardwaj, G., Camillus, J.C. & Hounshell, D.A. (2005) Continual Corporate Entrepreneurial Search for Long-Term Growth, *Management Science*, Vol. 52 (2).
- Birkinshaw, J. & Ridderstråle, J. (1999) Fighting the corporate immune system: A process study of subsidiary initiatives in multinational corporations, *International Business Review*, Vol. 8.
- Boudreau, K. & Lakhani, K. (2009) How to Manage Outside Innovation, *Sloan Management Review*, Vol. 50 (4).
- Brabham, D. (2008) Crowdsourcing as a Model for Problem Solving: An Introduction and Cases Convergence, *The International Journal of Research into New Media Technologies*, Vol. 14 (1).
- Browning, L.D., Beyer, J.M. & Shetler, J.C. (1995) Building Cooperation in a Competitive Industry: SEMATECH and the Semiconductor Industry, *Academy of Management Journal*, Vol. 38 (1).
- Brown & Eisenhardt (1997) The Art of Continuous Change, *Administrative Science Quarterly*, Vol. 42 (1).
- Burgelman, R.A. (1983a) A Process Model of Internal Corporate Venturing in the Diversified Major Firm, *Administrative Science Quarterly*, Vol. 28 (2).

## Bibliography

- Burgelman, R.A. (1983b) A Model of Interaction of Strategic Behavior, Corporate Context, and the Concept of Strategy, *Academy of Management Review*, Vol. 8 (1).
- Burgelman, R.A. (1983c) Corporate Entrepreneurship and Strategic Management: Insights from a Process Study, *Management Science*, Vol. 29 (12).
- Burgelman, R.A. (1991) Intraorganizational Ecology of Strategy Making and Organizational Adaption: Theory and Field Research, *Organization Science*, Vol. 2 (3).
- Burt, R.S. (1992) *Structural holes: The social structure of competition*, Cambridge, Mass.: Harvard University Press.
- Burt, R.S. (2004) Structural Holes and Good Ideas, *American Journal of Sociology*, Vol. 110 (2).
- Cassiman, B. & Veugelers, R. (2006) In Search of Complementarity in Innovation Strategy: Internal R&D and External Knowledge acquisition, *Management Science*, Vol. 52 (1).
- Chandy, R. & Tellis, G. (1998) Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize, *Journal of Marketing Research*, Vol. 35 (4).
- Chesbrough, H. (2003a) *Open Innovation. The New Imperative for creating and profiting from technology*, Boston: Harvard Business School Press.
- Chesbrough, H. (2003b) The Logic of Open Innovation: Managing Intellectual Capital, *California Management Review*, Vol. 45 (3).
- Chesbrough (2006) Open Innovation: A new paradigm for understanding industrial innovation, in Chesbrough, H., Vanhaverbeke, W. & West, J. (eds), *Open Innovation: Researching a New Paradigm*, Oxford: Oxford University Press.
- Child, J. (1997) Strategic Choice in the Analysis of Action, Structure, Organizations and Environment: Retrospect and Prospect, *Organization Studies*, Vol. 18 (1).
- Christensen, C. (1997) *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Boston: Harvard Business School Press.

*Attraction: A new driver of learning and innovation*

- Christensen, C.M. & Rosenbloom, R.S. (1995) Explaining the Attackers Advantage, *Research Policy*, Vol. 24 (2).
- Christensen, C. & Bower, J. (1996) Customer Power, Strategic Investment and the Failure of Leading Firms, *Strategic Management Journal*, Vol. 17 (3).
- Cohen, W.M. & Levinthal, D.A. (1989) Innovation and Learning: The Two Faces of R&D, *The Economic Journal*, Vol. 99 (397).
- Cohen, W.M. & Levinthal, D.A. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly*, Vol. 35 (1).
- Cohen, W.M. & Levinthal, D.A. (1994) Fortune Favours the Prepared Firm, *Management Science*, Vol. 40 (2).
- Cohen, W.M., Nelson, R.R. & Walsh, J.P. (2000) Protecting their intellectual assets: Appropriability conditions and why U.S. manufacturing firms patent (or not), NBER Working paper series, No. 7552.
- Corbin, J. & Strauss, A. (2008) *Basics of Qualitative Research*, Thousand Oaks: Sage.
- Crossan, M. & Bedrow, I. (2003) Organizational Learning and Strategic Renewal, *Strategic Management Journal*, Vol. 24 (11).
- Cyert, R.M. & March, J.G. (1963) *A Behavioral Theory of the Firm*, Englewood Cliffs, NJ: Prentice Hall.
- Czernich, C. (2004) *When Ideas Meet Organizations: The survival of entrepreneurial ventures inside the established firm*, Published Doctoral Dissertation, Stockholm: Institute of International Business.
- Danneels, E. (2002) The Dynamics of Product Innovation and Firm Competences, *Strategic Management Journal*, Vol. 23 (12).
- Danneels, E. (2007) The Process of Technological Competence Leveraging, *Strategic Management Journal*, Vol. 28 (5).
- Danneels, E. (2008) Organizational Antecedents of Second-Order Competences, *Strategic Management Journal*, Vol. 29 (5).
- De Vaus, David (2001) *Research Design in Social Research*, Thousand Oaks: Sage.



## Bibliography

- Deeds, C. & David, D. (1996) Strategic alliances and the rate of new product development: An empirical study of entrepreneurial biotechnology firms, *Journal of Business Venturing*, Vol. 11 (1).
- Delios, A. & Beamish, P. (1999) Geographic Scope, Product Diversification, and the Corporate Performance of Japanese Firms, *Strategic Management Journal*, Vol. 20 (8).
- Denrell, J, Fang, C. & Winter S.G. (2003) The Economics of Strategic Opportunity, *Strategic Management Journal*, Vol. 24 (Special Issue).
- Dess, G. & Beard, D. (1984) Dimensions of Organizational Task Environments, *Administrative Science Quarterly*, Vol. 29 (1).
- Dewar, R. & Dutton, J. (1986) The Adoption of Radical and Incremental Innovations: An Empirical Analysis, *Management Science*, Vol. 32 (11).
- Dhanaraj, C. & Parkhe, A. (2006) Orchestrating Innovation Networks, *Academy of Management Review*, Vol. 31 (3).
- Dierickx, I., & Cool, K., (1989) Asset Stock Accumulation and Sustainability of Competitive Advantage, *Management Science*, Vol. 35 (12).
- Dosi, G. (1982) Technological Paradigms and Technological Trajectories, *Research Policy*, Vol. 11 (3).
- Dougherty, D. & Hardy, C. (1996) Sustained Product Innovation in Large, Mature Organizations: Overcoming Innovation-to-Organization Problems, *Academy of Management Journal*, Vol. 39 (5).
- Doz, Y., Santos, J. & Williamson, P. (2001) *From Global to Meta-national*, Boston: Harvard Business School Press.
- Dushnitsky, G. & Lenox, M. (2005) When does corporate venture capital investment create firm value? *Journal of Business Venturing*, Vol. 21 (6).
- Dushnitsky, G. & Lenox, M. (2006) When Do Firms Undertake R&D by Investing in New Ventures? *Strategic Management Journal*, Vol. 26 (10).
- Dutton, J. & Ashford, S. (1993) Selling Issues to Top Management, *Academy of Management Review*, Vol. 18 (3).

*Attraction: A new driver of learning and innovation*

- Dutton, J. & Ashford, S., O'Neill, R. & Lawrence, K. (2001) Moves That Matter: Issue Selling and Organizational Change, *Academy of Management Journal*, Vol. 44 (4).
- Easterby-Smith, M., Thorpe, R. & Lowe, A. (2002) *Management Research: An introduction*, London: Sage.
- Edman, J. (2009) *The Paradox of Foreignness: Norm-breaking MNEs in the Japanese Banking Industry*, Published Doctoral Dissertation, Stockholm: Institute of International Business.
- Eisenhardt, K.M. (1989a) Building Theory from Case Study Research, *Academy of Management Review*, Vol. 14 (4).
- Eisenhardt, K.M. (1989b) Making Fast Strategic Decisions in High-velocity Environments, *Academy of Management Journal*, Vol. 32 (3).
- Eisenhardt, K.M. & Martin, J.A. (2000) Dynamic Capabilities: What are they? *Strategic Management Journal*, Vol. 21 (10/11).
- Eisenhardt, K.M. & Graebner, M.E. (2007) Building Theory from Cases: Opportunities & Challenges, *Academy of Management Journal*, Vol. 50 (1).
- Elsbach, K. D. & Sutton, R. I. (1992) Acquiring Organizational Legitimacy through Illegitimate Actions: A Marriage of Institutional and Impression Management Theories, *Academy of Management Journal*, Vol. 35 (4).
- Fleming, L. & Sorenson, O. (2004) Science as a Map in Technological Search, *Strategic Management Journal*, Vol. 25 (8/9).
- Fontana, A. & Frey, J.H. (1994) Interviewing: The Art of Science. In N. Denzin & Y.Lincoln (Eds.), *Handbook of qualitative research* (pp. 361–377), Thousand Oaks: Sage.
- Gans, J.S. & Stern, S. (2002) The Product Market and the Market for "Ideas": Commercialization Strategies for Technology Entrepreneurs, *Research Policy*, Vol. 32 (2).
- Gavetti, G. & Levinthal, D. (2000) Looking Forward and Looking Backward: Cognitive and Experiential Search, *Administrative Science Quarterly*, Vol. 45 (1).

## Bibliography

- Gavetti, G., Levinthal, D. & Rivkin, J. (2005) Strategy Making in Novel and Complex worlds: The Power of Analogy, *Strategic Management Journal*, Vol. 26 (1).
- Gavetti, G. & Rivkin, J. (2007) On the Origins of strategy: Action and Cognition over Time, *Organization Science*, Vol. 18 (3).
- Gibbert, M, Ruigrok, W. & Wicki, B. (2008) What Passes as a Rigorous Case Study? *Strategic Management Journal*, Vol. 29 (13).
- Gioia, D.A., Schultz, M. & Corley, K.G. (2000) Organizational identity, image and adaptive instability, *Academy of Management Review*, Vol. 25 (1).
- Glaser, B.G. & Strauss, A.L. (1967), *The Discovery of Grounded Theory: Strategies for qualitative research*, New York: Aldine.
- Golden, B. (1992) The Past Is the Past--Or Is It? The Use of Retrospective Accounts as Indicators of past Strategy, *Academy of Management Journal*, Vol. 35 (4).
- Golden, B. (1997) Further Remarks on Retrospective Accounts in Organizational and Strategic Management Research, *Academy of Management Journal*, Vol. 40 (5).
- Granovetter, M.S. (1973) The Strength of Weak Ties, *American Journal of Sociology*, Vol. 78 (6).
- Granstrand, O., Patel P. & Pavitt, K. (1997) Multi-technology corporations: why they have "distributed" rather than "distinctive core" competencies, *California Management Review*, Vol 39 (4).
- Gray, J. & Balmer, E. (1999) Corporate identity and corporate communications: creating a competitive advantage, *Corporate Communication*, Vol. 4 (4).
- Greve, H. (2003) A Behavioral Theory of R&D Expenditures and Innovations: Evidence from Shipbuilding, *Academy of Management Journal*, Vol. 46 (6).
- Greve, H. (2007) Exploration and exploitation in product innovation, *Industrial and Corporate Change*, Vol. 16 (5).
- Gulati, R. (1998) Alliances and Networks, *Strategic Management Journal*, Vol. 19 (4).
- Gulati, R., Nohria, N. & Zaheer, A. (1998) Strategic Networks, *Strategic Management Journal*, Vol. 21 (3).

*Attraction: A new driver of learning and innovation*

- Gupta, A.K., Smith, K.G. & Shalley, C.E. (2006) The Interplay between Exploration and Exploitation, *Academy of Management Journal*, Vol. 49 (4).
- Haagedorn, J. & Duysters, G. (2002) External Sources of Innovative Capabilities: The Preference for Strategic Alliances or Merger and Acquisitions, *Journal of Management Studies*, Vol. 29 (2).
- Hagström, P. (1991) *The 'Wired' MNC: The Role of Information Systems for Structural Change in Complex Organizations*, Published Doctoral Dissertation, Stockholm: Institute of International Business.
- Hambrick, D. (1982) Environmental Scanning and Organizational Strategy, *Strategic Management Journal*, Vol. 3 (2).
- Hannan, M.T. & Freeman, J. (1984) Structural Inertia and Organizational Change, *American Sociological Review*, Vol. 49 (2).
- Hansen, M.T. (1999) The Search-transfer Problem: The Role of Weak Ties in Sharing Knowledge across Organization Subunits, *Administrative Science Quarterly*, Vol. 44 (1).
- Hargadon, A. & Sutton, R.I. (1997) Technology Brokering and Innovation in a Product Development Firm, *Administrative Science Quarterly*, Vol. 42 (4).
- Hargadon, A. (1998) Firms as Knowledge Brokers: Lessons in Pursuing Continuous Innovation, *California Management Review*, Vol. 40 (3).
- Hayek, F. (1945) The Use of Knowledge in Society, *The American Economic Review*, Vol. 35 (4).
- Helfat, C., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. & Winter, S. (2007) *Dynamic Capabilities: Understanding Strategic Change in Organizations*, Malden: Blackwell Publishing.
- Henderson R.M. (1993) Underinvestment and Incompetence as Responses to Radical Innovation: Evidence from the Photolithographic Alignment Equipment Industry, *RAND Journal of Economics*, Vol. 24 (2).
- Henderson, R.M. & Clark, K.B. (1990) Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms, *Administrative Science Quarterly*, Vol. 35 (1).

## Bibliography

- Henkel, J. (2006) Selective revealing in open innovation processes: The case of embedded Linux, *Research Policy*, Vol. 35 (7).
- Hill, C. & Rothaermel, F. (2003) The Performance of Incumbent Firms in the Face of Technological Innovation, *Academy of Management Review*, Vol. 28 (2).
- von Hippel, E. (1986) Lead Users: A Source of Novel Product Concepts, *Management Science*, Vol. 32 (7).
- von Hippel, E. (1988) *The Sources of Innovation*, New York: Oxford University Press.
- von Hippel, Eric (2005). *Democratizing Innovation*, Cambridge, MA: MIT Press.
- von Hippel, E. & Katz, R. (2002) Shifting Innovation to Users Via Toolkits, *Management Science*, Vol. 48 (7).
- Hitt, M., Ireland, D., Camp, M. & Sexton, D. (2001) Guest Editors' Introduction to the Special Issue on Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth creation, *Strategic Management Journal*, Vol. 22 (Special Issue).
- Huber, G. & Power, D. (1985) Retrospective Reports of Strategic-level Managers: Guidelines for Increasing their Accuracy, *Strategic Management Journal*, Vol. 6 (2).
- Ireland, R.D., Hitt, M.A. & Sirmon, D.G. (2003) A Model of Strategic Entrepreneurship: The Constructs and its Dimensions, *Journal of Management*, Vol. 29 (6).
- Jeppesen, L.B. & Molin, M. (2003) Consumers as Co-developers: Learning and Innovation Outside the Firm, *Technology Analysis and Strategic Management*, Vol. 15 (3).
- Jeppesen, L.B. & Lakhani, K. (2010) Marginality and Problem Solving: Effectiveness in Broadcast Search, *Organization Science*, Vol. 21 (1).
- Jonsson, S. & Regnér, P. (2009) Normative barriers to imitation: social complexity of core competences in a mutual fund industry, *Strategic Management Journal*, Vol. 30 (5).
- Kattila, R. & Ahuja, G. (2002) Something Old, Something New: A Longitudinal Study of Search Behaviour and New Product Innovation, *Academy of Management Journal*, Vol. 45 (6).

*Attraction: A new driver of learning and innovation*

- Katz, R. & Allen, T. (2007) Investigating the Not Invented Here (NIH) Syndrome: A Look at the Performance, Tenure, and Communication Patterns of 50 R & D Project Groups, *R&D Management*, Vol. 12 (1).
- King, G., Keohane, R. & Verba S. (1994) *Designing Social Inquiry: Scientific Inferences in Qualitative Research*, Princeton: Princeton University Press.
- King, D., Covin, J. & Hegarty, H. (2003) Complementary Resources and the Exploitation of Technological Innovations, *Journal of Management*, Vol. 29 (4).
- Kirzner, I. (1997) Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach, *Journal of Economic Literature*, Vol. 35 (1).
- Kirzner, I. (1999) Creativity and/or Alertness: A Reconsideration of the Schumpeterian Entrepreneur. *Review of Austrian Economics*, Vol. 11.
- Kogut, B. & Zander, U. (1992) Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology, *Organization Science*, Vol. 3 (3).
- Kogut, B. & Zander, U. (1996) What Firms do? Coordination, Identity, and Learning, *Organization Science*, Vol. 7 (5).
- Kogut, B. & Metiu, A. (2001) Open Source Software Development and Distributed Innovation, *Oxford Review of Economic Policy*, Vol. 17 (2).
- Kroll, M., Toobs, L. & Wright, P. (2002) Napoleon's tragic march home from Moscow: Lessons in Hubris, *Academy of Management Executive*, Vol. 14 (1).
- Laamanen, T. & Autio, E. (1996) Dominant dynamic complementarities and technology-motivated acquisitions of new, technology-based firms, *International Journal of Technology Management*, Vol. 12 (7/8).
- Lakhani, K. (2006) Broadcast Search in Problem Solving: Attracting Solutions from the Periphery, Unpublished Manuscript.

## Bibliography

- Lakhani, K.R., Jeppesen, L.B., Lohse, P.A. & Panetta, J.A. (2007) The Value of Openness in Scientific Problem Solving, Harvard Business School Working Paper 07-050.
- Lane, D. & Maxfield, R. (1996) Strategy under Complexity: Fostering Generative Relationships, *Long Range Planning*, Vol. 29 (2).
- Lane, P. & Lubatkin, M. 1998, Relative absorptive capacity and interorganizational learning, *Strategic Management Journal*, Vol. 19 (5).
- Langley, A. (1999) Strategies for Theorizing from Process Data, *Academy of Management Review*, Vol. 24 (4).
- Lant T.K. & Montgomery, D.D. (1987) Learning from Strategic Success and Failure, *Journal of Business Research*, Vol. 15 (6).
- Laursen, K. & Salter, A. (2005) Open for Innovation: The Role of Openness in Explaining Innovation Performance among U.K. Manufacturing Firms, *Strategic Management Journal*, Vol. 27 (2).
- Lavie, D. & Rosenkopf, L. (2006) Balancing Exploration and Exploitation in Alliance Formation, *Academy of Management Journal*, Vol. 49 (6).
- Leonard-Barton, D. (1991) Core Capabilities and Core Rigidities: A Paradox in Managing New product Development, *Strategic Management Journal*, Vol. 13 (Special Issue).
- Levinthal, D.A. (1997) Adaption on Rugged Landscapes, *Management Science*, Vol. 43 (7).
- Levinthal, D.A. & March, J.G. (1993) The Myopia of Learning, *Strategic Management Journal*, Vol. 14 (Special Issue).
- Levitt, B. & March, J.G. (1988) Organizational Learning, *Annual Review of Sociology*, Vol. 14.
- Li, D., Eden, L., Hitt, M. & Ireland, D. (2008) Friends, Acquaintances, or Strangers? Partner Selection in R&D Alliances, *Academy of Management Journal*, Vol. 51 (2).
- Lovas, B. & Ghoshal, S. (2000) Strategy as guided evolution, *Strategic Management Journal*, Vol. 21.
- Lyles, M.A., & Schwenk, C.R. (1992) Top Management, Strategy and Organizational Knowledge Structures, *Journal of Management Studies*, 29 (2).

*Attraction: A new driver of learning and innovation*

- Makadok, R. & Barney, J. (2001) Strategic Factor Market Intelligence: An Application of Information Economics to Strategy Formulation and Competitor Intelligence, *Management Science*, Vol. 47 (12).
- Mantere, S. (2005). Strategic Practices as Enablers and Disablers of Championing Activity. *Strategic Organization*, Vol. 3 (2).
- Mantere, S. (2008) Role expectations and middle manager strategic agency, *Journal of Management Studies*, Vol. 45 (2).
- March, J.G. (1991) Exploration and Exploitation in Organizational Learning, *Organization Science*, Vol. 2 (1).
- Marshall, C. & Rossman, G. (2006) *Designing Qualitative Research*, Thousand Oaks: Sage Publications.
- Mathisen, S, (1988) Why Triangulate? *Educational Researcher*, Vol. 17 (2).
- McPherson, M., Smith-Lovin, L. & Cook, J. (2001) Birds of a Feather: Homophily in Social Networks, *Annual Review of Sociology*, Vol. 27.
- McDermot, C. & O'Connor, G. (2001) Managing Radical Innovation: an Overview of Emergent Strategy Issues, *The Journal of Product Innovation Management*, Vol. 19 (6).
- Merriam, S.B. (2002) *Qualitative Research in Practice, Examples for Discussion and Analysis*, San Francisco: Jossey-Bass.
- Miles, M. & Huberman, M. (1994) *Qualitative Data Analysis*, Thousand Oaks: Sage Publications.
- Miller, D. (1993) The Architecture of Simplicity, *Academy of Management Review*, Vol. 18 (1).
- Miller, D. (1994) What Happens After Success: The Perils of Excellence. *Journal of Management Studies*, Vol. 31 (3).
- Miller, D. (2003) An Asymmetry-Based View of Advantage – Overcoming the Sustainability-Attainability Dilemma, *Strategic Management Journal*, Vol. 24 (10).
- Miller, C., Cardinal, L. & Glick, W. (1997) Retrospective Reports in Organizational Research: A Reexamination of Recent Evidence, *Academy of Management Journal*, Vol. 41 (1).



## Bibliography

- Minzberg, H. (1979) An Emergent Strategy of "Direct" Research, *Administrative Science Quarterly*, Vol. 24 (4).
- Moran, P., & Ghoshal, S. (1999) Markets, Firms and the Process of Economic Development, *Academy of Management Review*, Vol. 24 (3).
- Mosakowski, E. (1997) Strategy Making Under Causal Ambiguity: Conceptual Issues and Empirical Evidence, *Organization Science*, Vol. 8 (4).
- Nelson, R. (1991) Why do firms differ, and how does it matter? *Strategic Management Journal*, Vol. 12 (Special Issue).
- Nelson, R. & S. Winter, (1982) *An Evolutionary Theory of Economic Change*, Cambridge: Harvard University Press.
- Nonaka, I., Toyama, R. & Nagata, A. (2000) A Firm as a Knowledge-creating Entity: A New Perspective on the Theory of the Firm, *Industrial and Corporate Change*, Vol. 9 (1).
- Ocasio, W. (1997) Towards an Attention-Based View of the Firm. *Strategic Management Journal*, Vol. 18 (Special Issue).
- O'Connor, G.C. & Rice, M.P. (2003) Opportunity Recognition and Breakthrough Innovation in Large Established Firms, *California Management Review*, Vol. 43 (2).
- Page, S. (2007) *The Difference: How the Power of Diversity Creates Better Groups, Teams, Schools and Societies*, Cambridge Mass.: Princeton University Press.
- Patel, P. & Pavitt, K. (1997) The Technological Competencies of the World's Largest Firms: Complex and Path-dependent, but not much Variety, *Research Policy*, Vol. 26 (2).
- Penrose, E. (1959) *The theory of the growth of the firm*, New York: Wiley.
- Pentland, B. (1999) Building Process Theory with Narrative: From Description to Explanation, *Academy of Management Review*, Vol. 24 (4).
- Peteraf, M.A. (1993) The Cornerstones of Competitive Advantage: A Resource-based View, *Strategic Management Journal*, Vol. 14 (3).

*Attraction: A new driver of learning and innovation*

- Pettigrew, A. (1992) The Character and Significance of Strategy Process Research, *Strategic Management Journal*, Vol. 13 (Special Issue).
- Pettigrew, A. (1990) Longitudinal Field Research on Change: Theory and Practice, *Organization Science*, Vol. 1 (3).
- Pierce, J.L. Boerner, C.S. & Teece, D.J. (2002) Dynamic Capabilities, Competence and the Behavioural Theory of the Firm, in Augier, M. & March, J.M., (eds) *The Economics of Change, Choice and Structure: Essays in the Memory of Richard M. Cyert*, Cheltenham: Edward Elgar.
- Podolny, J.M. (2005) *Status Signal: A Sociological Study of Market Competition*, Cambridge: Princeton University Press.
- Porac, J.F., Thomas H., & Baden-Fuller, C. (1989) Competitive Groups as Cognitive Communities: The Case of Scottish Knitwear Manufacturers, *Journal of Management Studies*, Vol. 26 (4).
- Porter, M. (1980) *Competitive Strategy*, New York: Free Press.
- Powell, W.W. (1998) Learning from Collaboration: Knowledge and Networks in the Biotechnology and Pharmaceutical industry, *California Management Review*, Vol. 40 (3).
- Powell, W.W., Koput, K.W. & Smith-Doerr, L. (1996) Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Bio-technology, *Administrative Science Quarterly*, Vol. 41 (1).
- Powell, W., White, D., Koput, K. & Owen-Smith, J. (2005) Network Dynamics and Field Evolution: The Growth of Interorganizational Collaboration in the Life Sciences, *American Journal of Sociology*, Vol. 110 (4).
- Prahalad, C.K. & Bettis, R.A. (1986) The Dominant Logic: A New Linkage Between Diversity and Performance, *Strategic Management Journal*, Vol. 7 (6).
- Prahalad, C.K. & Hamel, G. (1990) The Core Competence of the Corporation, *Harvard Business Review*, Vol. 68 (3).
- Pratt, M. (2009) From the Editors: For the Lack of a Boilerplate: Tips on Writing Up (and Reviewing) Qualitative Research, *Academy of Management Journal*, Vol. 52 (5).

## Bibliography

- Regnér, P. (1999) *Strategy Creation and Change in Complexity – Adaptive and Creative Learning Dynamics in the Firm*, Published Doctoral Dissertation, Stockholm: Institute of International Business.
- Regnér, P. (2001) Complexity and Multiple Rationalities in Strategy Processes, in Volberda, H.W. & Elfring, T, (eds), *Rethinking Strategy*, London, UK: Sage.
- Regnér, P. (2003) Strategy Creation in the Periphery: Inductive Versus Deductive Strategy Making, *Journal of Management Studies*, Vol. 40 (1).
- Regnér, P. (2005) Adaptive and creative strategy logics in strategy processes, in Szulanski G., Porac J. & Doz, Y. (eds), *Strategy Process (Advances in Strategic Management, Vol. 22)*, Amsterdam: Elsevier.
- Regnér, P. & Bohman, C. (2009) Individuality in strategizing activity and practice: Formulators, implementers, innovators, Conference Paper: Presented at EGOS Colloquium 2009.
- Ridderstråle, J, (1996) *Global Innovation*, Published Doctoral Dissertation, Stockholm: Institute of International Business.
- Rivkin, J & Siggelkow, N. (2007) Patterned Interaction in Complex Systems: Implications for Exploration, *Management Science*, Vol. 53 (7).
- Rivkin, J. (2000) Imitation of Complex Strategies, *Management Science*, Vol. 46 (6).
- Roethermal, F.T. (2001) Complementary Assets, Strategic Alliances, and the Incumbent's Advantage: An Empirical Study of Industry and Firm Effects in the Biopharmaceutical Industry, *Research Policy*, Vol. 30 (8).
- Rothaermel, F. & Boeker, W. (2008) Old Technology Meets New Technology: Complementarities, Similarities, and Alliance Formation, *Strategic Management Journal*, Vol. 29 (1).
- Rosenkopf, L. & Nerkar, A. (2001) Beyond Local Search: Boundary-spanning, Exploration, and Impact in the Optical Disc Industry, *Strategic Management Journal*, Vol. 22 (4).
- Rosenkopf, L. & Almeida, P. (2003) Overcoming Local Search through Alliances and Mobility, *Management Science*, Vol. 49 (6).

*Attraction: A new driver of learning and innovation*

- Rumelt, R. (1987) Theory, Strategy, and Entrepreneurship, in Teece, D.J. (Ed.), *The Competitive Advantage – Strategies for Industrial Innovation and Renewal*, New York: Harper & Row.
- Rumelt, R. (1995) Inertia and Transformation, in Montgomery, C.A. (Ed.), *Resource-Based and Evolutionary Theories of the Firm*, Dordrecht: Kluwer Academic Publishers.
- Sarasvathy, S., Dew, N., Velamuri, S. & Venkataraman, S. (2003) Three views of entrepreneurial opportunity, in Acs, Z. & Audretsch, D.B. (Eds.), *Handbook of Entrepreneurial Research*, Dordrecht: Kluwer Academic Publishers.
- Schildt, H. & Laamanen, T. (2006) Who buys whom: Information environments and organizational boundary spanning through acquisitions, *Strategic Organization*, Vol. 4 (2).
- Schumpeter, J. (1934) *The Theory of Economic Development*, New Brunswick: Transaction Publishers.
- Scott, W. R. (2001) *Institutions and Organizations*, Thousand Oaks: Sage Publications.
- Shan, W., Walker, G & Kogut, B. (1994) Interfirm cooperation and startup innovation in the biotechnology industry, *Strategic Management Journal*, 15 (5).
- Shane, S. (2000) Prior Knowledge and the Discovery of Entrepreneurial opportunities, *Organization Science*, Vol. 11 (4).
- Shane, S. (2003) *A general theory of entrepreneurship: The individual-opportunity nexus*, Cheltenham: Edward Elgar Publishing.
- Shane, S. & Venkataraman, S. (2000) The promise of entrepreneurship as a field of research, *Academy of Management Review*, Vol. 25 (1).
- Siggelkow, N. (2002) Evolution toward Fit, *Administrative Science Quarterly*, Vol. 47 (1).
- Siggelkow, N. (2001) Change in the Presence of Fit: The Rise, the Fall, and the Renaissance of Liz Claiborne, *Academy of Management Journal*, Vol. 44 (4).
- Siggelkow N. (2007) Persuasion with Case Studies, *Academy of Management Journal*, Vol. 50 (1).

## Bibliography

- Siggelkow, N. & Rivkin, J. (2005) Speed and Search: Designing Organizations for Turbulence and Complexity, *Organization Science*, Vol. 16 (2).
- Siggelkow, N. & Rivkin, J. (2006) When Exploration Backfires: Unintended Consequences of Multilevel Organizational Search, *Academy of Management Journal*, Vol. 49 (4).
- Simon, H.A. (1955) A Behavioral Model of Rational Choice, *The Quarterly Journal of Economics*, Vol. 69 (1).
- Sleifer, R., McDermott, C., O'Connor, G., Peter, L., Rice, M. & Veryzer, R. (2000) *Radical Innovation*, Boston: Harvard Business Press.
- Stebbins, R. (2001) *Exploratory research in the social sciences*, Thousand Oaks: Sage.
- Street, C. & Cameron, A. (2007) External Relationships and the Small Business: A Review of Small Business Alliance and Network Research, *Journal of Small Business Management*, Vol. 45 (2).
- Stuart, T.E. & Podolny, J.M. (1996) Local Search and the Evolution of Technological Capabilities, *Strategic Management Journal*, Vol. 17 (1).
- Suddaby, R (2006) What Grounded Theory is Not, *Academy of Management Journal*, Vol. 50 (1).
- Surowiecki, J. (2004) *The Wisdom of Crowds*, New York: Anchor Books.
- Tapscott, D. & Williams, A. (2007) *Wikinomics – How Mass Collaboration Changes Everything*, London: Atlantic Books.
- Teece, D.J (1986) Profiting from Technological innovation: Implications for integration, collaboration, licencing and public policy, *Research Policy*, Vol. 15 (6).
- Teece, D.J. (2007) Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance, *Strategic Management Journal*, Vol. 28 (13).
- Teece, D.J., Pisano, G. & Shuen, A. (1997). Dynamic Capabilities and Strategic Management, *Strategic Management Journal*, Vol. 18 (7).
- Teigland, R. (2003) *Knowledge Networking: Structure and Performance in Networks of Practice*, Published Doctoral Dissertation, Stockholm: Institute of International Business.

*Attraction: A new driver of learning and innovation*

- Thomke, S., & Kuemmerle, W. (2002) Asset Accumulation, Interdependence and Technological Change: Evidence from Pharmaceutical Drug Discovery, *Strategic Management Journal*, Vol. 23 (7).
- Tripsas, M. (1997) Unraveling the Process of Creative Destruction: Complementary Assets and Incumbent Survival in the Typesetter Industry, *Strategic Management Journal*, Vol. 18 (Special Issue).
- Tripsas, M. & Gavetti, G. (2000) Capabilities, Cognition, and Inertia: Evidence from Digital Imaging, *Strategic Management Journal*, Vol. 21 (10/11).
- Turban, D. & Cable, D. (2003) Firm Reputation and Applicant Pool Characteristic, *Journal of Organizational Behavior*, Vol. 24 (6).
- Tushman, M.L. & Anderson, P. (1986) Technological Discontinuities and Organizational Environments, *Administrative Science Quarterly*, Vol. 31 (3).
- Vanhaverbeke, W. (2006) The interorganizational context of open innovation, in Chesbrough, H., Vanhaverbeke, W. & West, J. (eds.), *Open Innovation: researching a New Paradigm*, Oxford: Oxford University Press.
- Walsh, J. (1995) Managerial and Organizational Cognitions: Notes from a Trip Down Memory Lane, *Organizational Science*, Vol. 6 (3).
- Weick, K. (1989) Theory Construction as Disciplined Imagination, *Academy of Management Review*, Vol. 14 (4).
- Weick, K. (2007) The Generative Properties of Richness, *Academy of Management Journal*, Vol. 50 (1).
- Whittington, R. (1996) Strategy as Practice, *Long Range Planning*, Vol. 29 (5).
- Williamson, O. (1991) Strategizing, Economizing, and Economic Organization, *Strategic Management Journal*, Vol. 12 (Special Issue).
- Winter, S.G. (2003) Understanding Dynamic Capabilities, *Strategic Management Journal*, Vol. 24 (10).
- Wooldridge, B. & Floyd, S. (1990) The Strategy Process, Middle Management Involvement, and Organizational Performance, *Strategic Management Journal*, Vol. 11 (3).

### *Bibliography*

- Yin, Robert K. (1994) *Case Study Research: Design and Methods*, Thousand Oaks: Sage Publications.
- Zahra, S. (2008) The Virtuous Cycle of Discovery and Creation of Entrepreneurial Opportunities, *Strategic Entrepreneurship Journal*, Vol. 2 (3).
- Zahra, S. A. & George, G. (2002) Absorptive Capacity: A Review, Reconceptualization, and Extension, *Academy of Management Review*, Vol. 27 (2).
- Zander, I. (1997) Technological Diversification in the Multinational Corporation – Historical Evolution and Future Prospects, *Research Policy*, Vol. 26 (2).
- Zander, U. (1991) *Exploiting a Technological Edge – Voluntary and Involuntary Dissemination of Technology*, Stockholm: Institute of International Business.





# SSE Publications

A complete publication list can be found at [www.hhs.se/research/publications](http://www.hhs.se/research/publications). Books and dissertations are published in the language indicated by the title and can be ordered via e-mail: [efi.publications@hhs.se](mailto:efi.publications@hhs.se).

## A selection of recent publications

---

### Books

- Barinaga, Ester. *Powerful dichotomies*.
- Ericsson, Daniel. *Den odöda musiken*.
- Ericsson, Daniel. *Scripting Creativity*.
- Melén, Sara. *Globala från start. Småföretag med världen som marknad*. Forskning i Fickformat.
- Mårtensson, Pär, Mähring, Magnus. *Mönster som ger avtryck: Perspektiv på verksamhetsutveckling*.
- Sjöström, Emma. *Ansiktslösa men ansvarsfulla*. Forskning i fickformat.
- Wijkström, Filip. *Civilsamhällets många ansikten*.

### Dissertations

- Alexandersson, Gunnar. *The Accidental Deregulation. Essays on Reforms in the Swedish Bus and Railway Industries*.
- Ejenäs, Markus. *Ledning av kunskapsintegration – förutsättningar och hinder: en studie av en fusion mellan IT- och managementkonsulter*.
- Engvall, Anders. *Poverty and Conflict in Southeast Asia*.
- Juks, Reimo. *Corporate Governance and the Firm's Behaviour towards Stakeholders*.
- Lychnell, Lars-Olof . *IT- relaterad verksamhetsförändring. Processer som formar växelspelat mellan utveckling och användning*.
- Magnusson Bernard, Kristin. *Remittances, Regions and Risk Sharing*.
- Mohlin, Erik. *Essays on Belief Formatic and Pro-Sociality*.
- Nakatani, Tomoaki. *Four essays on building Conditional Correlation GARCH models*.
- Siming, Linus. *Private Equity and Advisors in Mergers and Acquisitions*.
- Sjöqvist Rafiqi, Pernilla. *Evolving Economic Landscapes: Institutions and localized economies in time and space*.
- Sunesson, Daniel. *School networks and active investors*.
- Öhman, Niclas. *Considering intentions*.



## Attraction

A New Driver of Learning and Innovation

Claes Bohman

In business environments characterized by technological change and rapid imitation, firms must continually innovate and identify new opportunities in order to remain competitive. This study investigates how external actors provide firms with innovative opportunities, ideas, and solutions. Specifically, it examines how firms are influenced by being approached by external innovators who “pitch” ideas for new products that they want to commercialize in cooperation with the firm. Conceptually, the study analyzes firms as magnets to which ideas and resources from outside the firm are attracted.

Employing a multiple case study design of Swedish and U.S. companies, the thesis reveals that a firm’s capacity for innovation and exploration of new opportunities is partly shaped by its ability to attract ideas and inventions from the outside environment. It also demonstrates that firms that are particularly attractive to external innovators are in a favorable position to identify and act on strategic opportunities and threats that emerge in their competitive environments.

The findings of the study suggest that in order to support their innovation and strategy creation processes, firms should work to stimulate inflows of externally developed ideas and inventions. This involves building a reputation of being trustworthy and receptive to external ideas, as well as broadcasting innovation projects and strategies so that external actors can easily understand how their ideas and inventions might fit into the firm’s innovation projects and strategies.



ISBN 978-91-7258-838-7



Attraction

Claes Bohman

# Attraction

A New Driver of Learning  
and Innovation

Claes Bohman