

Exploring Corporate Foresight in the Start-up Context

Theoretical and practical considerations toward an integrated approach

Master's Thesis

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September 2015

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I hereby declare that I have written this Master's Thesis independently, that I have completely specified the utilized sources and resources and that I have definitely marked all parts of the work—including tables, maps and figures—which belong to other works or to the internet, literally or extracted, by referencing the source as borrowed.

Berlin, 14th September, 2015

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Management Summary

Corporate foresight involves future-oriented awareness and enables the company to detect discontinuous change early, interpret the consequences for the company and formulate effective strategic responses. In the present thesis a focus is set on incumbent firms exposed to external change arising from start-ups. It is argued that start-ups are particular sources of disruptions which have therefore to be integrated into the corporate foresight activities. The exploratory research aims at extending the corporate foresight knowledge base to the start-up context and is organized around the following research question: *How do established companies across different industries integrate start-ups into their corporate foresight activities?*

Based on 10 semi-structured interviews with foresight experts across different industries, the findings show how firms identify relevant start-ups and what are possible corporate foresight outcomes with the aim to successfully innovate and adapt to disruptive changes. The findings indicate that start-ups were integrated into corporate foresight in order to source new ideas, to identify upcoming trends in the business environment, to recruit high-potentials as well as a way to perform market-testings. By doing so, corporate foresight practices needed new information sources as well as modern methodologies. Companies had to actively engage with start-ups and the community by organizing hackathons, fairs or contests in order to recognize promising start-ups in their relevant business areas. The insights gained from the corporate foresight activities triggered new kinds of strategic responses: start-up collaborations were established, start-ups were integrated into business units, strategic start-up investments were undertaken, accelerators were opened as well as start-ups were ‘acqui-hired’ based on corporate foresight results.

However, the integration of start-ups into the corporate foresight processes needed adaptations to the current corporate foresight elements and practices in order to recognize the specific characteristics of the start-ups context. Thereupon six challenges

for the integration process were identified. Corporate foresight had to extend its information sources to more modern and start-up suitable data sources that enabled a broad and continuous environmental scanning including distant and adjacent business areas as well as possible white spots. Subsequent to the information gathering process, feedback loops were identified as critical success factors for the data processing and knowledge building. These quality control mechanisms ensured a high quality and a high relevance of foresight outcomes to current strategic issues. A company-wide communication of corporate foresight results stimulated conversations within the company and fostered thereby a future-oriented thinking of employees. An overarching top-management attention and commitment was identified as an important success factor, especially in the case of start-ups, which collided with organizational structures and corporate mentalities due to their speed, agility and out-of-the-box thinking. In addition, the supporting role of a ‘foresight culture’, characterized by entrepreneurial spirit, commitment, sharing and creativity, was critical for the success and impact of start-up focused corporate foresight activities. Furthermore foresight support systems were pointed out to as important enablers of foresight capabilities in the start-up context that will increasingly gain importance for the development of future corporate foresight practices.

Preface

The present thesis is the final assignment of the double degree master program in Innovation Management and Entrepreneurship at the Technical University of Berlin, Germany, and in Business Administration at the University of Twente, The Netherlands.

Throughout this report a large amount of support and constructive feedback has been obtained from fellow students, practitioners, and researchers from the two involved universities. I am grateful to everyone who has been involved in the thesis. However, I wish to dedicate a special thank you to my supervisors from Berlin, Prof. Dr. Katharina Hölzle and Bastian Halecker, whose inputs, help, and feedback to this research have been very valuable. Furthermore a particular thank you is dedicated to my supervisors from the University of Twente, Dr. Rainer Harms and Prof. Dr. Steven Walsh. Moreover, I would like to thank all the interview participants of the research for sharing their interesting and valuable insights.

A very special thank you goes to my parents who taught me the importance of pursuing an exciting university education that truly reflects my interests, the value of questioning the mainstream and thinking out-of-the-box, and the pleasure of taking many breaks and enjoying life.

Thank you!

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List of Abbreviations

CAQDAS computer aided qualitative data analysis software.

CEO chief executive officer.

FinTech financial technology.

ICT information and communication technology.

IPM innovation portfolio management.

IT information technology.

R&D research and development.

RBV resource-based view.

SIM strategic issue management system.

VC venture capitalist.

CHAPTER 1

Introduction

“The world is changing very fast. Big will not beat small anymore. It will be the fast beating the slow.”

— Rupert Murdoch, *Founder and CEO of News Corporation*

1.1 Research Goal

One occurrence of innovation emerging as strategically important to firms in practice is that of disruptive innovation. So-called disruptions emphasize different product or service attributes, start out as small and low-margin businesses and subsequently grow to capture a large share of the established market. Over time, they improve and are thereby able to deliver performance that is ‘good enough’ in the old attributes that established competitors emphasize and ‘superior’ in the new attributes (Charitou and Markides, 2003, pp. 56–57). At this stage, disruptions broaden and develop new markets by providing new functionalities and, thus, disrupt and destroy existing market structures (Yu and Hang, 2010, p. 1). Various examples from the past such as Kodak (Tripsas and Gavetti, 2000) and Barnes & Noble (MacCormack et al., 2014) have shown the difficulties for companies when adapting to external disruptive changes, ultimately leading to a high mortality of established companies. For instance, de Geus (1997) came to the result that the life expectancy of a Fortune 500 company is below 50 years, because most companies were not able to adapt themselves to changes in their business environment (de Geus, 1997, p. 53). Research has identified the high rate of change, inertia and ignorance as the three major reasons why companies fail to adapt to such changes in an effective and timely manner (Rohrbeck and Gemünden, 2011, p. 232). In order to surmount these difficulties, corporate

foresight has been proven as a valuable mechanism to detect external changes early on as well as to trigger and facilitate organizational responses (Rohrbeck, 2014, p. 59). Engaging in corporate foresight allows therefore organizations to maintain sufficient flexibility for future developments and unforeseen circumstances (Keller and von der Gracht, 2014, p. 81).

Inactive. Slow. Arrogant. Incompetent. These are terms researchers use to describe how incumbent and large firms have fared in with disruptive innovations (Ghemawat, 1991; Henderson, 1993; Chandy and Tellis, 2000). Many large corporations fail to develop disruptive innovations, whereas on the other hand new and small entrepreneurial firms, so-called start-ups, are likely to have more inventive capabilities than established companies and are therefore recognized as more appropriate engines of radical and disruptive innovations (Assink, 2006, p. 215; O'Connor, 2006, p. 7; Neyens et al., 2010, p. 394). Start-ups succeed better in disruptive innovation because of their smaller sizes, lower organizational bureaucracy, shorter path-dependent histories, and more limited commitments to value networks and current technological paradigms (O'Connor, 2006, p. 8; Yu and Hang, 2010, p. 7). As Chandy and Tellis puts it, *“radical innovation is likened to a game of chutes and ladders, in which incumbents abruptly lose their positions to upstart outsiders”* (Chandy and Tellis, 2000, p. 14). However, start-ups often lack the necessary resources and reputation to bring a new technology, product or service to a broad market (Baum et al., 2000, p. 268; Alvarez and Barney, 2001, p. 142). Established companies, in turn, have the distribution, manufacturing, marketing resources as well as the financial capabilities that start-ups need to commercialize their product or services (Alvarez and Barney, 2001, p. 139). Alliances between start-ups and established companies can create economic value and are thereby recognized as important mechanisms to overcome smallness and newness effects of start-ups (Alvarez and Barney, 2001; Khilji et al., 2006; Neyens et al., 2010).

In this thesis a focus is set on incumbent firms exposed to external change arising from start-ups. It is argued that start-ups are particular sources of disruptions and have therefore to be considered as potential threats to established companies. In order to identify relevant disruptive start-ups early on and to anticipate with strategic responses, corporate foresight activities have to be extended to the start-up context. However, the literature on corporate foresight has not yet addressed the start-up context and its implications for corporate foresight's information sources, methods,

people and networks, organization, and culture. Moreover, an integration of start-ups into the corporate foresight processes needs adaptations to the current corporate foresight elements and practices in order to recognize the specific characteristics of the start-up context.

1.2 Research Question

The present research is organized around the following research question:

Research Question *How do established companies across different industries integrate start-ups into their corporate foresight activities?*

In particular, the integration refers to how established companies, which already have traditional corporate foresight activities in place, extent their foresight practices to the start-up context. Thereby established companies are defined as those with more than 100 employees, existing for more than 5 years and having sales in excess of \$3 million (i.e. €2.65 million), as suggested by Peterson et al. (2008, p. 355). A focus is set on how firms identify innovative start-ups in their business area and what are possible corporate foresight outcomes with the aim to innovate successfully and/or adapt to disruptive changes. Rohrbeck's (2010) maturity model of corporate foresight with the dimensions of *information usage, method sophistication, people and networks, organization, and culture* will be used to research the start-up focused corporate foresight activities alongside multiple dimensions. Thereby the hurdles, barriers and needed adaptations of the current foresight practices to the start-up context are investigated.

1.3 Theoretical Underpinnings

The central concepts of this thesis are corporate foresight and entrepreneurship. Corporate foresight can be defined as “*an ability that includes any structural or cultural element that enables the company to detect discontinuous change early, interpret the consequences for the company, and formulate effective responses to ensure the long-term survival and success of the company*” (Rohrbeck, 2010, p. 12). In the recent years corporate foresight has become the prevalent term used by companies for their future-oriented research activities. Accordingly, the main objective of corporate foresight can be seen as the analysis of long-term prospects in business environments, markets, competitors and new technologies, and their implications for

corporate strategies and innovation (Ruff, 2006, p. 280; von der Gracht et al., 2010, p. 381). Research on corporate foresight has been approached from three different research streams: (1) strategic management, (2) innovation management, and (3) futures research.

The *strategic management* perspective assumes that organizations alter and indeed have to alter their strategy, when faced with external change. In order to identify these external changes, companies must continuously scan the environment for discontinuities (Ruff, 2006; Rohrbeck and Gemünden, 2011). Such discontinuities, called strategic surprises by Ansoff (1975), are significant departures from the past and represent a potential threat or opportunity for the company. Weak signals are first symptoms of strategic discontinuities (Holopainen and Toivonen, 2012, p. 199). They are precursors of possible future changes and act as warning signs or signs of new possibilities (Ansoff, 1975; Holopainen and Toivonen, 2012). Companies have therefore to scan the environment in order to create knowledge about the direction and magnitude of emerging external change (Jain, 1984; Day and Schoemaker, 2005; Rohrbeck and Gemünden, 2011) and harness it as a source for new innovations (Nylén and Holmström, 2015, p. 7).

The *innovation management* literature recognizes corporate foresight as a mechanism for companies to increase the chances to profit from discontinuous changes. According to Bessant et al. (2005, pp. 1369–1370), the company should harness the environment as source of future-oriented information with the goal to anticipate and monitor competitors, technologies, customers and their changing needs. Thereby the company should develop processes and techniques to systematically scan the periphery, amplify weak signals and use its technological antennae in order to seek out the potential of new technologies, products and business models, and to create actionable insights of potential discontinuities (Paap and Katz, 2004, p. 22).

Futures research aims at a systematic exploration, prediction and explanation of future developments. With the use of different methods and techniques, such as trend exploration, technology forecasting and roadmapping, scenario analysis, and Delphi studies, it enhances sensing change and adapting or renewing accordingly to multiple possible, probable, and preferable futures (van der Duin et al., 2014). Futures research attempts to gain a holistic and systemic view based on insights from different disciplines and tries to challenge and unpack the assumptions behind dominant and contending views of the future (Rohrbeck and Bade, 2012).

Based on the findings from Rohrbeck and Schwarz (2013) and Vecchiato (2014) corporate foresight contributes value to the firm in several ways:

- Corporate foresight fosters an enhanced perception of the environment. By continuously scanning the business environment the firm gains deep insights into environmental changes and is thereby able to reduce the uncertainty (Rohrbeck and Schwarz, 2013).
- Corporate foresight enhances the firm's capacity to interpret and respond to changes in the environment. This is not only due to an augmented perception of environmental changes, but also due to an enhanced development and orchestration of actions when dealing with uncertainty (Rohrbeck and Schwarz, 2013).
- Corporate foresight fosters organizational learning. The foresight process itself triggers discussion about the future, re-educates the attention of the management, and therefore enhances an organization's memory of the future (Rohrbeck and Schwarz, 2013).
- Corporate foresight establishes memories of future sources of first mover advantages. By anticipating changes in external environments, the company is able to achieve first mover advantages and, thus, gain a head start in the development and pre-emption of these advantages in comparison to their rivals. These allow in turn organizations to recognize and address these sources more promptly as well as more profitably than rivals that do not use foresight (Vecchiato, 2014).

When extending the corporate foresight activities to the start-up context, a clear delimitation of start-ups from other businesses is of uttermost importance. The entrepreneurship literature suggests several different definitional criteria for start-ups: According to Luger and Koo, a start-up can be defined as *"a business entity which did not exist before during a given time period (new), which starts hiring at least one paid employee during the given time period (active), and which is neither a subsidiary nor a branch of an existing firm (independent)"* (Luger and Koo, 2005, p. 19). Blank extends the definition by emphasizing scalability as the main criterion for start-ups. For this reason he defines a start-up as *"a temporary organization designed to search for a repeatable and scalable business model"* (Blank, 2013, p. 67). In order to recognize the role of the fuzzy environment while starting up, Ries includes in addition the uncertainty aspect of new business in his definition: *"A start-up is a human institution designed to create a new product or service under conditions*

of extreme uncertainty” (Ries, 2011, p. 27). In the present thesis, all five criteria (newness, activity, independency, scalability, uncertainty) are used when classifying businesses as start-ups.

When looking at start-ups from a corporate perspective, several possible advantages and value contributions become apparent. First, start-ups can be seen as way to externalize research and development (R&D), serving as upstream suppliers of technology for established firms, rather than as horizontal innovation-oriented competitors. This can be accomplished through means of licensing, strategic alliances or even outright acquisitions and is, for instance, common practice in the biotechnology industry (Gans et al., 2002, p. 583). Second, by partnering up with start-ups established firms can not only source innovative ideas, but also profit from the advantages of start-ups when commercializing disruptive and radical innovations. Through alliances with start-ups established companies can gain access to an entrepreneurial firm’s complementary resources and thereby drive innovation (Alvarez and Barney, 2001, pp. 139–140). Third, by investing in start-ups companies can get an inside look at new technological fields and a possible use of new ideas, and can therefore allow a firm to respond quickly to market transformations (Lerner, 2013, p. 88). Moreover, such corporate venturing activities can serve as an intelligence-gathering initiatives with the aim of helping a company to protect itself from emerging competitive threats (Lerner, 2013, p. 89). Fourth, the so-called practice of ‘acqui-hiring’ allows established companies to gain access to young talented employees and thereby to improve their existing products, drive innovation or reconfigure their capabilities (Chatterji and Patro, 2014, p. 404).

1.4 Contributions

It is assumed to show how established companies integrate start-ups into their corporate foresight activities in order to detect discontinuities in a timely manner and anticipate them with appropriate strategic responses. Therefore the theoretical contributions of the present research lies in extending the knowledge base of corporate foresight to the start-up context and in proposing tailored foresight activities for the specific context. Accordingly, it will be shown how the corporate foresight dimensions, taken from the maturity model of corporate foresight of Rohrbeck (2010), have to adapt when integrating start-ups into corporate foresight.

The expected contributions to management practices are (1) the identification of the status-quo of start-up focused corporate foresight activities across different industries and (2) the identification of challenges when integrating start-ups into corporate foresight activities. This may help practitioners to guide the efforts of companies to enhance their own practices as well as to overcome hurdles when integrating start-ups into their corporate foresight activities.

Theoretical Foundation of Corporate Foresight

2.1 Definition

The term corporate foresight has its roots in the strategic foresight research and is used to emphasize the application of foresight practices in private companies, whereas the term strategic foresight includes the application of foresight practices in the public domain as well.

Scholars such as Becker (2002, p. 7) defined corporate foresight with emphasizing its process characteristic. However, corporate foresight is not just a project or a process with a clear start and finish, since it includes next to the processes and techniques also any other cultural and structural elements. Therefore I follow the understanding of corporate foresight as an ability and define corporate foresight in this thesis as:

“Corporate foresight is an ability that includes any structural or cultural element that enables the company to detect discontinuous change early, interpret the consequences for the company, and formulate effective responses to ensure the long-term survival and success of the company” (Rohrbeck, 2010, p. 12).

In the recent years corporate foresight has become the prevalent umbrella term used by companies for their future-oriented research activities (Ruff, 2006, p. 279; von der Gracht et al., 2010, p. 381). However, the term corporate foresight was introduced initially to differentiate against forecasting, which aims at predicting the development of a known trend or issue based on past data. Corporate foresight, in contrast, is directed at identifying, interpreting and responding to new emerging

issues for which often no past data is available and therefore forecasting would not be possible (Rohrbeck and Gemünden, 2008, p. 2). Another term used in this domain is technology foresight. Technology foresight aims at a systematic recognition and observation of new or existing technologies, an evaluation of their potential as well as importance to the company, and the storing and diffusion of information (Reger, 2001, p. 535). Corporate foresight, in contrast, is conducted from a broader perspective with different strategic focuses and includes also economical, social, environmental and legal aspects (Reger, 2001, p. 550).

In this thesis the framework of Rohrbeck (2010), the so-called maturity model of corporate foresight, will be used as a guideline throughout the research. The framework of corporate foresights describes key capabilities in five dimensions to assess the corporate foresight system concerning its strength in identifying, interpreting and responding to discontinuous change. The first dimension, *information usage*, refers to the kind of information that is collected and integrated into the corporate foresight activities. The *method sophistication* describes the methods used to systematically interpret the future-oriented information. The capability area of *people and networks* indicates the characteristics of the foresighters as well as of the internal and external network used by the company. The *organization* dimension refers to the organizational setting of corporate foresight and describes its use as well as its subsequent insight diffusion in the company. The fifth dimension of *culture* captures the extend to which the corporate culture supports or hinders the foresight efforts (Rohrbeck and Gemünden, 2008, p. 13; Rohrbeck, 2010, p. 78).

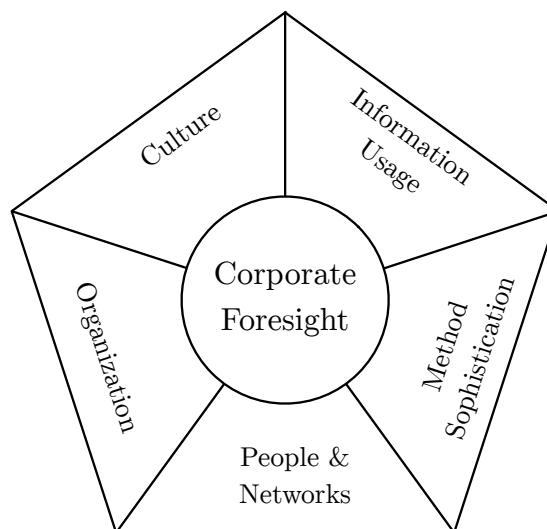


Figure 2.1: The five dimensions of Rohrbeck's maturity model of corporate foresight

2.2 Perspectives on Corporate Foresight

Historically, research on corporate foresight has been conducted by scholars from different business science research streams. As a consequence, research on corporate foresight still exhibits a cross-functional character. In the following, corporate foresight is examined and discussed from three different perspectives, namely the strategic management, the innovation and technology management, and the future research perspective, as also suggested by Rohrbeck (2010, p. 5).

2.2.1 Strategic Management Perspective

According to Porter, strategy is all about creating a unique and valuable market position, making trade-offs between pursuing new activities and rejecting new ideas, and creating a strategic fit by aligning company activities in order to support the chosen strategy (Porter, 1996). The strategic management perspective assumes that organizations alter and indeed have to alter their strategy when faced with external change. In order to identify these external changes, companies must continuously scan the environment for discontinuities (Ruff, 2006, p. 290; Rohrbeck, 2010, p. 15; Rohrbeck and Gemünden, 2011, p. 233). Such discontinuities, called strategic surprises by Ansoff (1975), are significant departures from the past and represent a potential threat or opportunity for the company. Weak signals are first symptoms of strategic discontinuities. They are precursors of possible future changes and act as warning signs or signs of new possibilities. When a weak signal first appears, the information included is very fuzzy and unstructured (Ansoff, 1975, 1980; Day and Schoemaker, 2005; Holopainen and Toivonen, 2012).

Researchers have used several other terms as synonyms for the concept of weak signals. Among the most well-known are the terms ‘germs’ and ‘seeds’ (Holopainen and Toivonen, 2012, p. 200). Also the concept of ‘wild cards’ has synonymously been used with weak signals, but there are researchers (Mendonça et al., 2004, p. 203; Hiltunen, 2006, p. 247) who disagree on that. These researches argue that weak signals should be separated from phenomena they indicate. Hiltunen partly clarifies the confusion by introducing the novel concept of ‘future signs’ which consists of three dimensions: the signal (representamen), the issue (object) and the interpretation (interpretant) (Hiltunen, 2008, p. 249). Although the difference between a phenomenon and its sign is clear in theory, it is often difficult to make as well as measure in practice (Holopainen and Toivonen, 2012, p. 200).

| | Minor Impact | Major Impact |
|------------------|-------------------|--------------|
| Low Probability | Meaningless Noise | Weak Signal |
| High Probability | Trend | Megatrend |

Table 2.1: Probabilities and effectiveness of futures phenomena.

Source: Kuosa (2010, p. 43)

Another important aspect of weak signals is the nature of the future phenomena they indicate. The two dimensions of future phenomena are the probability of occurrence and the degree of impact, which separate thereby phenomena that are able to cause substantial impacts from those which cannot. When a future phenomena with a low probability will have only a minor impact, it is categorized as meaningless noise (see Table 2.1). Weak signals have a low probability of coming true, but reveal a major impact. As the probability rises, phenomena with minor impact are called trends. Phenomena with major impacts and a low probability are trends, whereas phenomena with major impacts and a high probability of realization are megatrends (Kuosu, 2010, p. 43; Holopainen and Toivonen, 2012, p. 200).

In order to affect the future, weak signals have to pass the surveillance filter, the mentality filter and the power filter as shown in Figure 2.2. These filters are Ansoff's conceptualization of mental models used in the evaluation of weak signals in an organization and describe factors hindering the perception of weak signals (Ilmola and Kuusi, 2006, p. 912). The surveillance filter refers to the detection of the weak signal. To pass the first filter, the company has to discover the emerging signal in the environment. A discontinuous or radical change in the environment entails an annulment of the past success model. Because individuals and organizations rely on the past success model, they notice the weak signals but do not understand the importance of them. The past success model blocks the newly emerging signals. This behavior is operationalized by Ansoff with the mentality filter. The power filter refers to the fact that when a weak signal is perceived and understood, it may be intentionally or unintentionally ignored and not taken advantage of. This represents the individual, manager or organization which is neglecting or delaying an appropriate response to the perceived weak signal (Ansoff, 1984; Ilmola and Kuusi, 2006, pp. 911–912; Holopainen and Toivonen, 2012, pp. 199–200).

Ansoff indicates that companies can pursue two options in order to prepare themselves for discontinuities: The first approach is to implement an effective and fast crisis

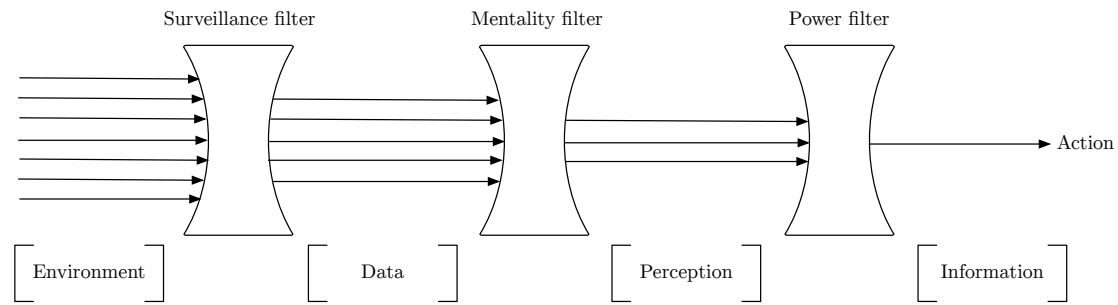


Figure 2.2: Ansoff's conceptualization of mental models used in the evaluation of weak signals. Adapted from Hiltunen (2006, p. 68)

management system. Hereby the company can react to strategic surprises only after their appearance. The second approach is to treat the strategic surprise before its appearance and thereby minimize its probability. Thereby the company needs to develop the ability for strategic preparedness (Ansoff, 1975, p. 33). The quality of the scanning and analysis methods in place limits the organization's capability to trigger direct managerial activities and therefore its strategic flexibility (Ilmola and Kuusi, 2006, p. 911). Both approaches use the environment as source of future-oriented information. For this purpose Ansoff introduced the concept of environmental scanning which will be discussed in the following paragraphs.

Environmental scanning is considered as the primary input to the strategy formulation process and contributes to the strategic fit of the company by aligning its competitive strategy to the environment (Daft and Weick, 1984, p. 127; Beal, 2000, p. 27; Abebe et al., 2010, p. 31). Furthermore strategic fit as a core concept of the strategy formulation has traditionally been viewed as having significant performance implications (Ginsberg and Venkatraman, 1985, p. 421). The initial concept of environmental scanning was first introduced by Ansoff (1975, 1980) with his concept of strategic issue management systems (SIMs). He proposed a framework of processes and procedures for an early detection and fast responses to weak signals in the environment. The system is characterized by its real-time and continuous preoccupation with strategic issues and by its continuous surveillance of the environment both inside and outside the enterprise (Ansoff, 1980, p. 134; Rohrbeck, 2010, p. 15). Later research of Jain (1984) clustered the search domain into the political, economic, social as well as technological sphere and defined appropriate search strategies due to different characteristics of each sphere. Other scholars such as Daft et al. (1988) and Day and Schoemaker (2005) redefined the search strategies and showed that

companies in complex, rapidly changing environments where uncertainty is high, need to scan with a greater frequency and make greater use of personal information sources than companies in relatively simple and stable environments (Daft et al., 1988, p. 123; Day and Schoemaker, 2005, p. 2). Rather than reducing complexity in scanning activities, companies are encouraged to harness it as it may be a source for new innovations (Nylén and Holmström, 2015, p. 7).

Further research of Hambrick (1982) and Daft and Weick (1984) identified environmental scanning as responsibility of the top-management. Their findings revealed that only top-management is able to trigger appropriate responses when discontinuities affect the whole company. Moreover Daft et al. (1988) showed, that top-management in high-performance companies scanned more broadly and more frequently than their counterparts in low-performing companies, indicating that there are not only significant differences in environmental scanning activities concerning the scanning frequency and scope, but also regarding the information usage, time horizon and effort.

According to Jain (1984), the evolution of scanning activities in a company occurs in a patterned fashion. The pattern is marked by the following four phases, whereas a progress from one phase to the next entails an explicit improvement both in information gathering and interpretation. Table 2.2 characterizes different features of the four phases.

- The first phase, *primitive scanning*, is characterized by a management that faces the environment as it appears and is exposed to information without making any use of it. As a consequence, scanning takes place without devoting any effort to it (Jain, 1984, p. 118).
- In the subsequent phase of *ad-hoc scanning*, the management is sensitive to information on specific issues in order to enhance the knowledge about these areas. Although no formal system and no initiative for scanning the environment is in place yet (Jain, 1984, p. 118).
- Companies in the third phase (*reactive scanning*) fully recognize the significance of environmental scanning, but realize it only in an unplanned and unstructured fashion. They face the environment to protect their future and are able to make appropriate responses to changes, but only in a reactive manner (Jain, 1984, p. 119).

| Phase 1 <i>Primitive</i> | Phase 2 <i>Ad-hoc</i> | Phase 3 <i>Reactive</i> | Phase 4 <i>Proactive</i> |
|--|--|---|---|
| Face the environment as it appears | Recognize the impact of the environment | Deal with the environment to protect the future | Predict the environment for a desired future |
| Exposure to information without purpose and effort | No active search Be sensitive to information on specific issues | Unstructured and unplanned effort Less specific information collection | Structured and planned effort Pre-established methodology Specific information collection |
| Scanning without a trigger | Scanning to enhance the understanding of a specific event | Scanning to make an appropriate response to market and competition | Scanning as a source of competitive advantage |

Table 2.2: Four phases in the evolution of environmental scanning.
Adapted from Jain (1984, p. 118)

- *Proactive scanning* is the fourth and last phase and is characterized by an pre-established, structured methodology and a thoroughly dissemination of information into the corporate strategy. Environmental scanning is seen as a proper way to be on the lookout for competitive advantages and to predict a desired future. The scanning is practiced not only at corporate level (macro), but also at product/market level (micro) (Jain, 1984, p. 119).

Conclusion 1 *Research on strategic management and environmental scanning has laid the ground for corporate foresight by introducing the concept of weak signals and identifying the environment as source of future-oriented information. Boundary-scanning information gathering and execution at top-management level appear thereby as critical success factors.*

2.2.2 Innovation Management Perspective

The goal of innovation management is to build structures and capabilities that enhance the idea generation, R&D of new technologies as well as the manufacturing and marketing processes of new (or improved) products, processes or equipment in order to ensure a long-term competitiveness of the company (Trott, 2008, p. 15). When looking at the historical evolution of innovation management, Niosi (1999), Nobelius (2004), Ortt and van der Duin (2008), and van der Duin et al. (2014) identified four different generations which are introduced in the following and will be

of great importance in the subsequent section 2.2.3:

1. *Technology push*: The first phase is characterized by linear innovation processes that are rooted in scientific discoveries and technological knowledge. Little attention is paid to the role of the market and to the overarching strategic goals (Ortt and van der Duin, 2008, p. 525; van der Duin et al., 2014, p. 63).
2. *Market pull*: The innovation processes are still linear but are triggered by an identification of market and societal needs. Furthermore innovation projects are only weakly strategy-driven and characterized by a spread of project management methods (Niosi, 1999, p. 112; Nobelius, 2004, p. 370; Ortt and van der Duin, 2008, p. 525).
3. *Parallel processes*: In this phase the innovation processes are a combination of technology push and market pull approaches and are fully aligned with the corporate strategy. Feedback loops and interactions with market needs and state-of-the-art technologies are established (Ortt and van der Duin, 2008, p. 526; van der Duin et al., 2014, p. 63).
4. *Innovation in systems or networks*: Parallel processes are used to involve multiple different organizations (e.g. competitors, suppliers or distributors) which contribute with complementary assets in order to increase the development speed. As a result, innovation processes are becoming more complex and hard to manage (Ortt and van der Duin, 2008, p. 526; van der Duin et al., 2014, p. 63).

The evolution of innovation management provoked an increase in innovation speed, shortened the product life cycle, speed up technological changes and enhanced the diffusion of innovations. Research has identified the high rate of change as one of the three major reasons why companies fail to adapt to the before mentioned external changes in an effective and timely manner (Rohrbeck and Gemünden, 2011, p. 232). Ignorance was determined as a second reason, which may be caused by a short-term orientation and internal focus of the company. Due to a lack of capacity to assess the potential impact of environmental changes and due to a filtering by middle management, environmental information do not reach the appropriate management level that can trigger adequate responses. Furthermore environmental signals may stay undetected because they are outside the reach of corporate sensors. A third reason is inertia. Complex internal and external structures as well as predominant

mental models prevent a perception of need to change (Rohrbeck and Gemünden, 2011, pp. 232–233).

Within the area of innovation management, the research streams of radical and disruptive innovations are of particular importance to corporate foresight. Both research areas aim to enhance the knowledge of how discontinuous changes occur and how they can be fostered by companies (Rohrbeck, 2010, p. 29). In order to start, innovation can be defined as “*new or significantly improved product (good or service), process, marketing method or organizational method*” (OECD, 2005, p. 46). When an innovation creates a new market and ultimately overtakes the existing market, it is classified as *disruptive innovation*. In contrast, a *sustaining innovation* improves an existing product but does not affect the existing market. Sustaining innovations can be evolutionary (continuous), when the customer expects the improvement, as well as radical (revolutionary, discontinuous), when the innovation occurs unexpected (Christensen, 1997).

Innovation management research identified several critical success factors for companies to develop radical and disruptive innovations. In the following, first success factors of radical innovations are presented which are then followed by drivers of disruptive innovations. The classic Schumpeterian theory suggests that firm size is an important determinant of radical product innovation. In contrast, Tellis et al. (2009) identified corporate culture as the strongest driver of radical innovation. The authors identified specific attitudes and practices that foster a culture of driving radical innovation. The attitudes include future market orientation, risk tolerance, and willingness to cannibalize, while the practices include providing incentives to employees for innovations and empowering product champions (Chandy and Tellis, 1998, pp. 483–484; Tellis et al., 2009, p. 16). The dominant corporate mindset was identified as another success factor of radical innovation. The findings from Talke (2007) show that a strong analytical, proactive as well as aggressive mindset is important for radical innovations. Together with visioning, which was identified by O’Connor and Veryzer (2001) as a critical factor for the corporate mindset, these factors are supposed to foster radical and innovations in companies.

Research on disruptive innovations focused on the drivers for disruptions and the management of discontinuous changes. Although Christensen (1997) identified technology as the most important driver for disruptions, Markides (2006) determined also business model innovations as well as product innovations as sources for disruptions.

But both product and business model innovations have different competitive effects as well as produce different kinds of markets and should therefore be treated as distinct phenomena (Markides, 2006, p. 19). According to Christensen (1997), technological disruptions are characterized by an initial underperformance, followed by a gradually performance increase and finally by a comprehensive replacement of the old technology. Disruptive business model innovations, in contrast, capture quickly a significant proportion of the market, but generally fail to completely overtake the traditional way of competing (Markides, 2006, p. 21). Disruptive product innovations on the other hand create new markets that “*undermine the competences and complementary assets on which existing competitors have built their success*” (Markides, 2006, p. 22). As a result of the different path dependencies of technological, product and business model innovations, companies need appropriate response strategies to manage these different kinds of disruptive changes. It becomes apparent that successful response strategies depend on the market/industry the company is operating in, firm competences such as motivation and ability as well as on the nature of the innovation and its growth rate (Arnold, 2003, pp. 30–32; Charitou and Markides, 2003, p. 63; Markides, 2006, pp. 22–23).

Regarding the area of corporate foresight, recent research identified emergent ‘good practices’ for the management of discontinuous changes. According to Bessant et al. (2005, p. 1373), companies should develop search intelligence in order to anticipate and monitor competitors, technologies, customers and their changing needs with the overarching goal of enhancing the company’s foresight and forecast ability. A further ‘good practice’ is to develop processes and techniques to scan the periphery, amplify weak signals and use technological antennae in order to seek out potential of new technologies, products and business models, and to create actionable insights of potential discontinuities (Paap and Katz, 2004, p. 22). Recent research of Paliokaitė and Pačėsa (2014) has provided empirical evidence that corporate foresight is able to trigger both evolutionary as well as radical innovation and thereby fostering organizational ambidexterity. Especially the environmental scanning capabilities as part of corporate foresight play a leading role when fostering radical innovation (Paliokaitė and Pačėsa, 2014, p. 11).

Conclusion 2 *The innovation management literature recognizes corporate foresight as a mechanism for companies to increase the chances to profit from discontinuous changes. Critical success factors are parallel and collaborative innovation processes in order to drive discontinuous innovations, as well as insight abilities in order*

to interpret potential discontinuities, and foresight abilities in order to anticipate discontinuous shocks and trigger managerial actions.

2.2.3 Futures Research Perspective

Futures research (also called futurology or future studies) aims at a systematic exploration, prediction and explanation of future developments. With the use of different methods and techniques such as trend exploration, technology forecasting and roadmapping, scenario analysis, and Delphi studies, it enhances sensing change and adapting or renewing accordingly to multiple possible, probable, and preferable futures (van der Duin et al., 2014, p. 64). Futures research attempts to gain a holistic and systemic view based on insights from different disciplines and tries to challenge and unpack the assumptions behind dominant and contending views of the future (Rohrbeck and Bade, 2012, pp. 5–6).

Van der Duin et al. (2014) compared future research in companies with their innovation processes from a historical perspective. The authors showed that as the innovation processes changed over time to include the market perspective and later networking in order to enhance the company’s innovation capacity, the future research activities changed as well. Table 2.3 shows the evolution of innovation processes and futures research and illustrates thereby the close link between innovation and futures research (van der Duin et al., 2014, p. 63).

Futures research contributed a large set of tools and methods to corporate foresight (see Technology Futures Analysis Methods Working Group (2004) for a comprehensive overview of future research methods). Most of the tools are results of national foresight research (van der Duin, 2006, p. 32). The early futures research was relying mainly on quantitative exploratory methods such as mathematical modeling, trend exploration and growth models in order to predict and forecast future developments. Futures

| | Innovation Processes | Futures Research |
|----------------------------|-----------------------------------|------------------------------|
| 1 st Generation | Technology push | Technology forecasting |
| 2 nd Generation | Market pull | Technology assessment |
| 3 rd Generation | Parallel processes | Exploratory futures research |
| 4 th Generation | Innovation in systems or networks | Networked foresight |

Table 2.3: Generations of innovation management and futures research.
Adapted from van der Duin et al. (2014, p. 64)

research was dominated by an engineering ideology until the 1960s, when expert opinions were included into futures research methods. The most prominent method, the Delphi analysis, has its origins in this period and is still used today. In the 1970s more sophisticated and more explorative methods such as scenario analysis were introduced. As a result, methods did not only take into account technological aspects, but started also to include economic, environmental, and socio-cultural drivers as well and fostered an exploration of multiple possible futures (Mietzner and Reger, 2005, p. 235; van der Duin, 2006, p. 30). With the progress of information and communication technology (ICT), future research methods changed significantly. New methods and techniques were able to deal with increased complexities across several corporations as well as networks and moved the focus of futures research away from a result-based toward a more process-oriented approach instead (van der Duin, 2006, p. 31). From the historical evolution of futures research a shift from mainly predicting the future toward mainly exploring and managing the future becomes apparent. As one scholar states it, *“futures research has become more interactive, information sources have become more diverse, and the process has become less linear”* (van der Duin, 2006, p. 31).

Apart from foresight-enabling methods, researchers discovered a high importance of the involved actors for futures research activities. Not only the skills of foresighters are crucial, but also their roles in the process. Daft and Weick (1984) identified boundary-spanning participants as important actors to channel information into the organizations. Another crucial factor is participation. In order to ensure success, multiple stakeholders, experts and decision makers need to be integrated in the process. Therefore appropriate motivation mechanisms need to be present and be aligned to the corporate context (Van der Helm, 2007, pp. 4–5; Öner and Göl, 2007, p. 451; Rohrbeck, 2010, p. 46).

Conclusion 3 *Alongside futures research methods, corporate foresight processes should move toward more interactive and qualitative studies with a process-oriented approach. The success of corporate foresight relies heavily on the involved actors. Therefore participants with desirable skills, roles and active participation are crucial for corporate foresight.*

2.2.4 Dynamic Capability Perspective

Based on the criticism that the resource-based view (RBV) fails to explain how and why some firms retain a sustaining competitive advantage in rapidly changing competitive environments, Teece et al. (1997) introduced the concept of dynamic capabilities and defined it as *“the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments”* (Teece et al., 1997, p. 516). Later scholars such as Eisenhardt and Martin integrated the notion of routines and defined dynamic capabilities as *“[...] the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die”* (Eisenhardt and Martin, 2000, p. 1107). Accordingly, dynamic capabilities consist of specific strategic and organizational processes such as new product development, alliancing and strategic decision making that create value for firms within dynamic markets by integrating, building and reconfiguring resources into new value-creating strategies (Eisenhardt and Martin, 2000, p. 1106).

The core dynamic capabilities can be disaggregated into (1) sensing, (2) seizing, and (3) recombination and reconfiguration (Teece, 2007). ‘Sensing’ refers to the capacity to identify and shape opportunities and threats as well as to the access of outside knowledge through alliancing. The capability of ‘seizing’ points to the appropriate actions taken based on the identified opportunities and to the proper investment into new ideas. As both sensing and seizing lead to new positions and paths, ‘recombination and reconfiguration’ then alter the assets of a firm. If these are continuous capabilities, they enable the firm to gain or maintain a competitive advantage even in rapid changing environments (Eisenhardt and Martin, 2000, pp. 1107–1108; Teece, 2007, pp. 1322–1341; Heger and Boman, 2014, pp. 2–3). As the aim of corporate foresight is to sense, gain insights and derive actions from environmental changes—disruptive changes arising from start-ups in case of this thesis—it can be regarded as a dynamic capability (Rohrbeck, 2010, p. 54; Heger and Boman, 2014, p. 4).

Conclusion 4 *Corporate foresight can be identified as dynamic capability that allows firms to constantly adapt and renew its resources.*

2.2.5 Causation and Effectuation Perspective

Sarasvathy (2001) identified two distinct approaches to explain the creation of new

firms, namely causation and effectuation. Whereas “*causation processes take a particular effect as given and focus on selecting between means to create that effect*” (Sarasvathy, 2001, p. 245), “*effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means.*” (Sarasvathy, 2001, p. 245). Therefore causation is generally associated with (ex-ante) rational planning and a logic of prediction, whereas effectuation is associated with (ex-post) emergent strategies and a logic of control (Sarasvathy, 2001, p. 243; Harms and Schiele, 2012, p. 96). The concept of causation and effectuation can also be applied in other areas than the new firm creation (Sarasvathy, 2001, p. 256). For instance, to explain the approaches of opportunity discovery and opportunity creation.

Corporate foresight can be a mechanism to discover opportunities as well as to actively create opportunities. Corporate foresight is linked to opportunity discovery through its identification of discontinuous change in the business environment. In this case, corporate foresight applies a causation approach by systematically scanning the environment, interpreting the consequences for the company, and reactively triggering strategic actions. Thereby the company takes the particular phenomena as given and selects between the possible managerial responses to anticipate discontinuous changes in the environment. On the other hand, corporate foresight fosters to look long-term and explores how to actively shape the future (Hammoud and Nash, 2014, p. 18). By enhancing future-oriented thinking and creating memories of the future (see section 2.3.1), foresighters are able to visit and experience the future ahead of time. As a consequence, corporate foresight can convince other organizations or stakeholders, e.g. politicians, to act and thereby to actively create opportunities and shape the future. For instance, corporate foresight could play an enabling role in systemic innovations in particular, where multiple actors need to work together to create a market or an industry (Rohrbeck and Schwarz, 2013, p. 1597).

Conclusion 5 *Corporate foresight is not only an organizational tool to discover potential business opportunities, but also a tool to actively create opportunities and thereby shape the future by influencing others to act.*

2.3 Relevance of Corporate Foresight

When looking at foresight activities from a company’s perspective, it becomes apparent that they contribute particular values to the firm. Based on findings from

several empirical studies, I will discuss the value creation from foresight activities and highlight the three roles corporate foresight can play thereby in the following.

2.3.1 Value Creation

Rohrbeck and Schwarz (2013) identified an enhanced perception through insights into changes in the environment as well as through a reduction of uncertainty as the most prominent value contribution of corporate foresight to the firm. In addition, the findings imply that corporate foresight is able to generate an enhanced capacity of the firm to interpret and respond to changes in the environment. This is not only due to an augmented perception of environmental changes, but also due to an enhanced development and orchestration of actions when dealing with uncertainty. Aside of the interpretation of and response to changes, corporate foresight enables also the firm to shape the future by convincing other organizations, stakeholders or politics. Especially in the case of systematic innovations, where multiple parties need to work together, corporate foresight is expected to influence others to act and to create a common future (Rohrbeck and Schwarz, 2013, pp. 1603–1604; Amanatidou, 2014, p. 274).

Another value contribution arises from the process of organizational learning. The foresight process triggers discussion about the future, builds up knowledge, re-educates the attention of the management, and therefore enhances the organization's memory of the future (Amanatidou, 2014, p. 274; Vecchiato, 2014, p. 6). According to Vecchiato (2014), organizational memory is able to influence responses of firms to environmental changes and thereby enhancing their performances in dynamic environments due to the reflection of knowledge developed from their past experience into their present and future actions. Corporate foresight carried out as continuous process, enables the firm to build and renew its collective memory of the future over time. By anticipating changes in external environments, the company is able to achieve first mover advantages and, thus, gain a head start in the development and pre-emption of these advantages in comparison to their rivals. Therefore the core value contribution of corporate foresight is the establishment of memories of future sources of first mover advantages. These allow in turn organizations to recognize and address these sources more promptly as well as more profitably than rivals that do not use foresight and contribute to long-term superior profits of the firm (Vecchiato, 2014, pp. 7–10).

Before the actual establishment and marketing of an innovation, corporate foresight can provide an organization with lead time on innovations (von der Gracht et al., 2010, p. 385). By gaining important information on possible future changes, threats, and opportunities through corporate foresight before the competitors, it can provide a head start on possible innovation projects (Jissink et al., 2014, p. 385). Hence, such a lead time could provide a source for competitive advantage. Organizations that learn quicker and predict customer needs better than its competitors can react quicker to changes in customer needs than those who do not (Woodruff, 1997, p. 145).

Conclusion 6 *Companies can profit from corporate foresight through an enhanced perception, enhanced ability to interpret change, and an enhanced ability to propose responses as well as through a reduction of the environmental uncertainty. Furthermore corporate foresight fosters organizational learning and can thereby anticipate environmental changes quicker and more effectively, ultimately yielding in lead time on innovations.*

2.3.2 Roles

Rohrbeck and Gemünden (2011) identified three roles that corporate foresight should play to maximize the innovation capacity of a firm:

- The main activities of the *initiator role* are the identification of new customer requirements through analyzing cultural shifts as well as doing market research, and the detection of emerging technologies by scanning the science and technology environment. Thereby corporate foresight can trigger innovations by initiating new R&D projects as well as new process or business model innovations. Furthermore corporate foresight's role is to identify new competitor's product concepts by monitoring its R&D projects, patenting activities, and press announcements (Rohrbeck and Gemünden, 2011, pp. 237–238).
- The *strategist role* provides guidance for the company's innovation efforts and directs its innovation activities. The function of corporate foresight in this role is to support the strategic review of the R&D portfolio by providing information about future insights that enable a change in the innovation portfolio and thus providing strategic guidance for future directions. Another function of the strategist role is the identification of new and disruptive business models in the environment. Thereby the company is able to challenge its current business model and gets insights into alternatives. Furthermore the foresight

process itself engages several stakeholders, triggers internal discussions and helps therefore to consolidate opinions and to create a common vision with a certain fuzziness in order to emphasize the uncertainty of the future (Rohrbeck and Gemünden, 2011, pp. 238–239).

- The *opponent role* focuses on challenging the current innovation ideas and basic assumptions in order to make adjustments to external changes possible. By challenging the state-of-the-art of current R&D projects corporate foresight is able to show how those projects need to be adapted to changes in the environment in order to ensure state-of-the-art innovations as outcomes (Rohrbeck and Gemünden, 2011, pp. 239–240). The third impact of the opponent role is “to scan spots that would otherwise be left unobserved” (Rohrbeck and Gemünden, 2011, p. 240). In doing so, the aim of corporate foresight is to scan the environment for disruptions that could endanger current and future innovation projects (Rohrbeck and Gemünden, 2011, p. 240).

When placing the three roles alongside the innovation management funnel (see Figure 2.3), the initiator role can be allocated to the idea generation step and the opponent role can be positioned as overarching role, challenging the status-quo at every step (Rohrbeck and Gemünden, 2011, pp. 237–240). The strategist, however, is not directly linked to the innovation process as it plays only a guiding and directing role (Rohrbeck, 2010, p. 185). Corporate foresight with especially its strategist role

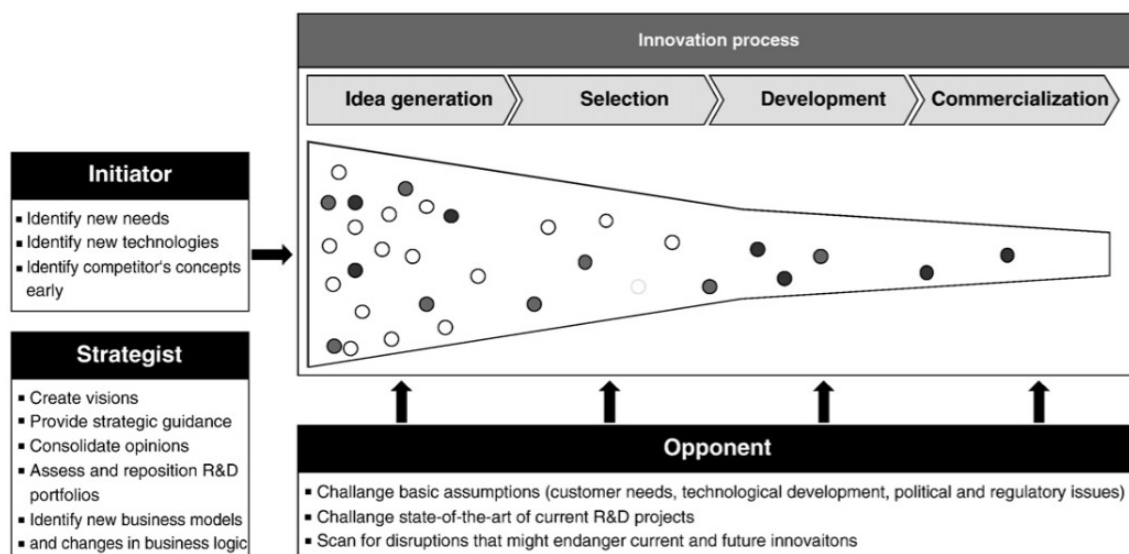


Figure 2.3: The three roles of corporate foresight alongside the innovation management process. Source: Rohrbeck and Gemünden (2011, p. 237)

is therefore closely linked to innovation portfolio management (IPM) (Farrington et al., 2012). IPM can be considered as a dynamic decision process with the goal of a continuous update and revision of the company’s innovation projects. *“In this process, new projects are evaluated, selected, and prioritized; existing projects may be accelerated, killed, or deprioritized; and resources are allocated and reallocated to the active projects”* (Cooper et al., 1999, p. 334). Thereby corporate foresight can support the analysis of the innovation portfolio with future insights into environmental changes. Accordingly, corporate foresight can be seen as a data–input and support tool for IPM (Rohrbeck, 2010, pp. 185–186).

Conclusion 7 *Corporate foresight can increase the firm’s innovation capacity by exploring new business fields (strategist role), fostering innovation concepts and ideas (initiator role) and challenging innovation projects (opponent role).*

2.4 Trends in Corporate Foresight

In order to provide an overview of future developments in the field of corporate foresight, trends were identified from the foresight literature and will be presented in the following.

2.4.1 Waves of Corporate Foresight

By studying the development of corporate foresight from the mid 1970s on, Daheim and Uerz (2008) identified four distinct although overlapping waves of corporate foresight. Each of the four waves represents a set of basic assumptions, dominant logics and key characteristics as well as perspectives. The waves are *expert-based foresight*, *model-based foresight*, *trend-based foresight* and *open foresight*.

- *Expert-based foresight*: The underlying assumption of this phase is that the future can be predicted by experts. By using methods such as Delphi analyses, roadmaps or scenarios, corporate foresight here aims at the exploration of change. A key pitfall of this phase is the delegation of responsibilities for the contents and outcomes of the foresight activities to experts. Expert-based foresight moves the learning–process and decision–making away from the organization into the hands of experts and can therefore lead to the company losing track of interdependencies between different developments and ignoring interdisciplinary questions and issues as well as decisions that need to be taken (Daheim and Uerz, 2008, p. 331).

- *Model-based foresight*: This wave is characterized by the assumption that the future can be calculated through the use of appropriate computer models based on data and mathematical frameworks. The pitfall lies here in losing sight of foresight's impacts on today's decisions on strategy and innovation (Daheim and Uerz, 2008, p. 331).
- *Trend-based foresight*: Corporate foresight aims here at understanding the future by anticipating the impact of trends on customers and markets. The focus is set on an early detection of weak signals by using a mix qualitative and quantitative methods. This leads to a high level of communication of results, but limits foresight to a reactive perspective and the organization as merely being driven by trends (Daheim and Uerz, 2008, pp. 331–332).
- *Open foresight*: Whereas the other three phases focus on a reactive approach, the emerging wave of open foresight is based on the assumption that organizations can proactively shape the future and markets by opening up the interaction between social, technological and economic forces. Open foresight's focus is set mainly to the open communication and discussion process wherein decisions for future strategy and innovation need to be taken. It is therefore characterized by transparency, a methodological hybrid, context orientation and participation (Daheim and Uerz, 2008, p. 332).

The findings of Daheim and Uerz (2008) indicate that corporate foresight is moving toward an open and interactive system with multiple internal as well as external stakeholders. This approach is related to the concept of *collaborative foresight* (Heger and Rohrbeck, 2012) which is also characterized by the integration of multiple perspectives and a involvement of external experts and internal stakeholders as well as a high interdependency between customer needs, technological capabilities, competitor behavior, legislative contingencies and production cost (Heger and Rohrbeck, 2012, p. 829).

Along with the rise of the popular 'open innovation' paradigm, networks have become a common approach to practicing innovation. Also corporate foresight can benefit from resources that become available when the knowledge base increases through networks. *Networked foresight* (Heger and Boman, 2014; van der Duin et al., 2014) is similar to corporate foresight, but is conducted in inter-organizational innovation networks with active contributions from the network partners and for the benefit for

the network partners and the network itself. First findings from Heger and Boman (2014) indicate that the broad resource base and the large pool of people with diverse backgrounds in the network seem to be valuable especially for sensing activities, i.e. environmental scanning and idea initiation (Heger and Boman, 2014, p. 16).

Regarding the process of corporate foresight itself, researchers point out that strategic foresight has become to only an episodic intervention by many practitioners. They argue that such an approach narrows the function of corporate foresight in a planning perspective. Therefore strategic foresight should be seen as an *“ongoing interrogation of implemented and envisioned strategies within emerging, alternative futures”* (Peter and Jarratt, 2014, p. 1) as well as a *“bundle of everyday organizing practices”* (Sarpong et al., 2013, p. 39) and as a *“continuous and contextual practice of ‘wayfinding’”* (Sarpong et al., 2013, p. 33).

2.4.2 Foresight Support Systems

Today, more and more foresight activities are supported by information and communication technology (ICT) (Rohrbeck et al., 2015, p. 115). ICT-based applications are an important enabler of foresight capabilities and will gain in importance in the coming years (Rohrbeck, 2010, p. 166). A recent Delphi study of Keller and von der Gracht (2014) on the future role of ICT in foresight activities revealed that the use of ICT will revolutionize the practice of foresight. The participating experts expected a fundamental shift from the collection of foresight data to the wise interpretation of information and its transfer into strategies and actions (Keller and von der Gracht, 2014, p. 81). Thereby the phrase ‘foresight support systems’ emerged as an umbrella term for ICT-tools used in foresight activities. Accordingly, von der Gracht et al. (2015) defines foresight support systems as *“collaborative computer-based systems aimed at supporting (1) communication, (2) statistical and qualitative data analysis, including expert assessments (3) decision modeling (4) and rules of order in foresight processes”* (von der Gracht et al., 2015, p. 2).

Also research recognizes the importance of foresight support systems in the development of corporate foresight. For example the special issue on ‘Foresight Support Systems: The Future Role of ICT for Foresight’ of the journal ‘Technological Forecasting and Social Change’ (Volume 97, August 2015) provides a collection of 10 articles related to foresight support systems. Various aspects of such support systems have thereby been examined: a conceptualization of foresight support systems (Keller

et al., 2015), a collective intelligence approach (Glenn, 2015), the role of Web 2.0 (Raford, 2015) and a fully ICT-supported foresight approach Rohrbeck et al. (2015). Further research investigated an ICT-supported weak signal detection (Thorleuchter and den Poel, 2013; Thorleuchter et al., 2014; Thorleuchter and den Poel, 2015), the automation of foresight methods such as technology roadmaps (Kayser et al., 2014), scenario analysis (Kayser and Shala, 2014) or innovation radars (Rohrbeck et al., 2006; Fiegenbaum and Mohout, 2015) as well as an autonomous internet-based environmental scanning (Decker et al., 2005).

In the recent years social media networks have gained remarkable popularity but only relatively little attention has been given to how these approaches could impact strategic foresight. Nevertheless, researchers point out that these online networks are also worth investigating due to the fact that these new modalities allow large-scale interaction among its members and can therefore be used as data source but also as a platform for conducting foresight exercises (Cachia et al., 2007, p. 1179; Kayser and Bierwisch, 2015, p. 5). Fiegenbaum and Mohout (2015), and Kayser and Bierwisch (2015) show different applications and use cases of how to use social media networks such as Twitter for foresight activities. The findings from Raford (2015) identified an increased participation in terms of amount and diversity, an increased volume and speed for data collection and analysis, an enhanced transparency, and decreased overall costs of project administration as impact of social media, Web 2.0 and crowdsourcing on foresight activities (Raford, 2015, p. 65).

Conclusion 8 *The corporate foresight process is steadily opening up (open foresight), tapping the organization's collaborations and networks (collaborative & networked foresight), is increasingly supported by ICT-tools (foresight support systems), is using a variety of different data sources and is moving toward a dynamic and continuous process.*

2.5 Start-ups and Innovation

In the previous chapters light was shed on corporate foresight from three different perspectives, the management theories of RBV and dynamic capabilities were related to it, the roles of corporate foresight were introduced, and the value contributions from corporate foresight activities as well as trends in this context were highlighted. This chapter is devoted to new small firms, so-called start-ups. First, a definition of start-ups is given and effects of new ventures on job creation, innovation and growth

are discussed. Second, collaboration modes of established companies and start-ups are presented and its entailed value contributions are highlighted.

The entrepreneurship literature suggests several different definitional criteria for start-ups. Luger and Koo (2005) identify the criteria of *newness*, *activity* and *independency* as main discriminators for start-ups. Taking all the three criteria together, the authors come up with the following definition:

“A start-up can be defined as a business entity which did not exist before during a given time period (new), which starts hiring at least one paid employee during the given time period (active), and which is neither a subsidiary nor a branch of an existing firm (independent)” (Luger and Koo, 2005, p. 19).

Graham (2012) disagrees on the newness criterion of start-ups and proposes the striving for growth as the most important characteristic of start-ups. Therefore he adds a growth dimension to his definition as follows:

“A startup is a company designed to grow fast. Being newly founded does not in itself make a company a startup. [...] The only essential thing is growth. Everything else we associate with startups follows from growth” (Graham, 2012, para. 1).

Blank (2013) extends the growth dimension by emphasizing *scalability* as the main criterion in his definition. Whereas growth means adding resources at the same rate as the revenue, scalability refers to the ability to increase revenues while marginal costs decrease with each unit of sales (Dudnik, 2010, para. 1). Accordingly, Blank defines a start-up as *“a temporary organization designed to search for a repeatable and scalable business model”* (Blank, 2013, p. 67).

Many authors point out that the process of starting up a new venture is a complex task, where many variables have to be considered. In order to recognize the role of such a fuzzy environment, Ries (2011) includes the *uncertainty* aspect of new ventures also in his definition of start-ups. Thereupon the author defines a start-up as *“a human institution designed to create a new product or service under conditions of extreme uncertainty”* (Ries, 2011, p. 27). When combining the main characteristics of start-ups identified from the scholars presented previously, I define and use the term start-up according to the following definition in the present thesis.

Conclusion 9 *A start-up is a new, active and independent business entity that is designed to search for a repeatable and scalable business model under conditions of extreme uncertainty.*

Besides the impact of start-ups at the corporate level, which will be discussed in the next section, research points out to several impact dimensions of start-ups on a national level. First, start-ups are a major source of new job creation (Shane, 2009; Malchow-Møller et al., 2011). However, as Wong et al. (2005) and Shane (2009) highlight, only a very small number of start-ups accounts for the vast majority of the job creation from entrepreneurial activity. The findings from these authors show, that only fast growing new firms, not new firms in general, contribute for most of the new job creation (Wong et al., 2005, p. 335; Shane, 2009, p. 146). Second, start-ups are important vehicles for exploiting opportunities and stimulating growth. Mueller (2007) shows that an increase in new firm formation activity stimulates economic growth and therefore supports a positive relationship between entrepreneurship and economic growth. Nevertheless, the author indicates that an increase in innovative start-up activity is more important than an increase in general start-up activity (Mueller, 2007, p. 360). Third, start-ups contribute to the regional development by impacting the employment change, labor productivity and structural changes of the region (Fritsch, 2008, pp. 3–5). Fourth, empirical literature suggests that disruptive innovations are generally developed and commercialized by new businesses (which will be discussed in detail in the next section) (Yu and Hang, 2010, p. 7). Start-ups as engines of disruptive innovation are therefore influencing the national rate of innovation as well (O’Connor, 2006; Yu and Hang, 2010).

2.5.1 Why Companies Should Look at Start-ups

In the following the value creation from start-ups in the corporate context will be discussed, i.e. how organizations can profit from looking at, collaborating with, learning from or investing in start-ups.

Start-ups can be considered by established companies as way to externalize R&D, serving as upstream suppliers of technology for established firms, rather than as a horizontal innovation-oriented competitor. For instance, in the biotechnology industry cooperations between start-ups innovators and more established firm are common practice and can also be a source of new ideas and concepts as well as trigger inter-organizational learning (Baum et al., 2000, p. 273; Gans et al., 2002, p. 571; Khilji et al., 2006, p. 529). Especially in the case of economic environments with strong intellectual property right enforcements and high upfront investment costs, companies tend to rely on innovations from the market for ideas. These upstream partnerships can be accomplished through means of licensing, strategic alliances or

even outright acquisitions (Gans et al., 2002, p. 583).

Alliances between start-ups and established companies can create economic value. Start-up firms are likely to have more inventive capabilities than established companies and are therefore recognized as more appropriate engines of radical and disruptive innovations (Assink, 2006, p. 215; O'Connor, 2006, p. 7; Neyens et al., 2010, p. 394). Start-ups succeed better in disruptive innovation compared to established firms, because of their smaller sizes, higher flexibility, lower organizational bureaucracy, shorter path-dependent histories, and more limited commitments to value networks and current technological paradigms (O'Connor, 2006, p. 8; Yu and Hang, 2010, p. 7). However, start-ups often face huge problems with respect to the commercialization of inventions (Alvarez and Barney, 2001, p. 141; Khilji et al., 2006, p. 536). Because of their small size and newness, start-up firms lack not only the necessary human, physical and financial resources to bring a new technology, product or service to the market, but lack also a reputation of quality, reliability and legitimacy that year of experience in providing particular products or services confers on more established firms (Baum et al., 2000, p. 268; Alvarez and Barney, 2001, p. 142). Established companies, in turn, have the distribution, manufacturing, marketing resources as well as the financial capabilities that start-ups need to commercialize their product or services (Alvarez and Barney, 2001, p. 139). Alliances between start-ups and established companies are recognized as important mechanisms to overcome such smallness and newness effects (Alvarez and Barney, 2001; Khilji et al., 2006; Neyens et al., 2010). First, alliances allow start-ups to get access to complementary capabilities that are necessary to introduce inventive ideas to a broad market (Alvarez and Barney, 2001, p. 140). Second, alliances may substantially reduce the financial costs and risks that are associated with innovation projects. Finally, alliances with prominent partners may have an important signaling effect and thereby positively influence the reputation of the start-up firms (Neyens et al., 2010, pp. 394–395).

Another approach to collaborate with start-ups and source innovative ideas is corporate venturing. By investing in start-ups companies can get an inside look at new technological fields and a possible use of new ideas, and can thereby help a company see, understand, and respond rapidly to changes in the business landscape (Lerner, 2013, p. 88). Moreover, corporate venturing activities can serve as intelligence-gathering initiatives with the aim of helping a company protect itself from emerging competitive threats (McGrath et al., 2006, p. 55; Lerner, 2013, p. 89).

By fostering the development of technologies and products that rely on the parent corporation's platform, corporate venture investments can help increase demand for the corporation's own products (Lerner, 2013, p. 90). Thereby corporate venturing benefits the core business and is also able to enhance the competitiveness of it (McGrath et al., 2006, p. 51).

Entrepreneurial firms can attract the most technically competent scientists, engineers and graduates. They do this by envisioning a great growth and impact perspective, and by compensating employees through stock and stock options—a form of compensation that promises great wealth if the start-up succeeds. Established firms are often unable to provide such career opportunities and thus are often less able to attract high-potentials as employees (Alvarez and Barney, 2001, p. 140). An emerging response to the drain of human resources is the phenomenon of 'acqui-hiring'. Acqui-hiring is the acquisition of small companies primarily to gain access to their employees and resources (Chatterji and Patro, 2014, p. 395). This emerging phenomenon has been well-documented in the popular press, but researchers have not explored how it fits into the corporate strategies of the acquiring firms. The authors show that acqui-hires allow the acquiring firm to improve their existing products, to drive innovations by creating new products or to reconfigure their capabilities by adding key talents to the management team (Chatterji and Patro, 2014, p. 404).

Conclusion 10 *Corporate foresight could help organizations to identify relevant start-ups early on, to gain insights and to respond with appropriate strategic decision as well as to learn from start-ups.*

2.6 Conceptual Model

From the literature review on corporate foresight, strategic management, innovation management and future research, as well as dynamic capabilities and entrepreneurship, 10 major conclusions have been drawn. Table 2.4 summarizes all conclusions derived from the different research streams. Based on these theoretical conclusions, a conceptual model of corporate foresight was developed (see Figure 2.4). The conceptual models was used as a guiding framework for the empirical part of this study and illustrates the basic process of corporate foresight. Starting point is the environment as a source of future-oriented information. Through environmental scanning weak signals are identified and data about trends as well as start-ups collected. Subsequently, these information are further processed and interpreted using various

| Research Stream (Conclusion no.) | Conclusion for corporate foresight |
|---|--|
| Strategic Management (Conclusion 1) | Research on strategic management and environmental scanning has laid the ground for corporate foresight by introducing the concept of weak signals and identifying the environment as source of future-oriented information. Boundary-scanning information gathering and execution at top-management level appear thereby as critical success factors. |
| Innovation Management (Conclusion 2) | The innovation management literature recognizes corporate foresight as a mechanism for companies to increase the chances to profit from discontinuous changes. Critical success factors are parallel and collaborative innovation processes in order to drive discontinuous innovations, as well as insight abilities in order to interpret potential discontinuities, and foresight abilities in order to anticipate discontinuous shocks and trigger managerial actions. |
| Futures Research (Conclusion 3) | Alongside futures research methods, corporate foresight processes should move toward more interactive and qualitative studies with a process-oriented approach. The success of corporate foresight relies heavily on the involved actors. Therefore participants with desirable skills, roles and active participation are crucial for corporate foresight. |
| Dynamic Capabilities (Conclusion 4) | Corporate foresight can be identified as dynamic capability that allows firms to constantly adapt and renew its resources. |
| Entrepreneurship (Conclusion 5) | Corporate foresight is not only an organizational tool to discover potential business opportunities, but also a tool to actively create opportunities and thereby shape the future by influencing others to act. |
| Corporate Foresight (Conclusion 6) | Companies can profit from corporate foresight through an enhanced perception, enhanced ability to interpret change, and an enhanced ability to propose responses as well as through a reduction of the environmental uncertainty. Furthermore corporate foresight fosters organizational learning and can thereby anticipate environmental changes quicker and more effectively, ultimately yielding in lead time on innovations. |
| Corporate Foresight (Conclusion 7) | Corporate foresight can increase the firm's innovation capacity by exploring new business fields (strategist role), fostering innovation concepts and ideas (initiator role) and challenging innovation projects (opponent role). |
| Corporate Foresight (Conclusion 8) | The corporate foresight process is steadily opening up (open foresight), tapping the organization's collaborations and networks (collaborative & networked foresight), is increasingly supported by ICT-tools (foresight support systems), is using a variety of different data sources and is moving toward a dynamic and continuous process. |
| Entrepreneurship (Conclusion 9) | A start-up is a new, active and independent business entity that is designed to search for a repeatable and scalable business model under conditions of extreme uncertainty. |
| Entrepreneurship (Conclusion 10) | Corporate foresight could help organizations to identify relevant start-ups early on, to gain insights and to respond with appropriate strategic decision as well as to learn from start-ups. |

Table 2.4: Overview of conclusions from the literature review

methodologies such as scenario techniques or Delphi studies. Afterwards the gained foresight results are transferred and communicated throughout the company. Thereby different managerial actions, which can differ from new product developments up to start-up investments, are triggered. The whole corporate foresight process is influenced by the dimensions of information usage, method sophistication, people and networks, organization, and culture. The numbers in brackets in Figure 2.4 refer to the corresponding sections in chapter 4, whereby related findings from the expert interviews are presented. The conceptual model is later redefined in chapter 5 by using insights from the empirical part.

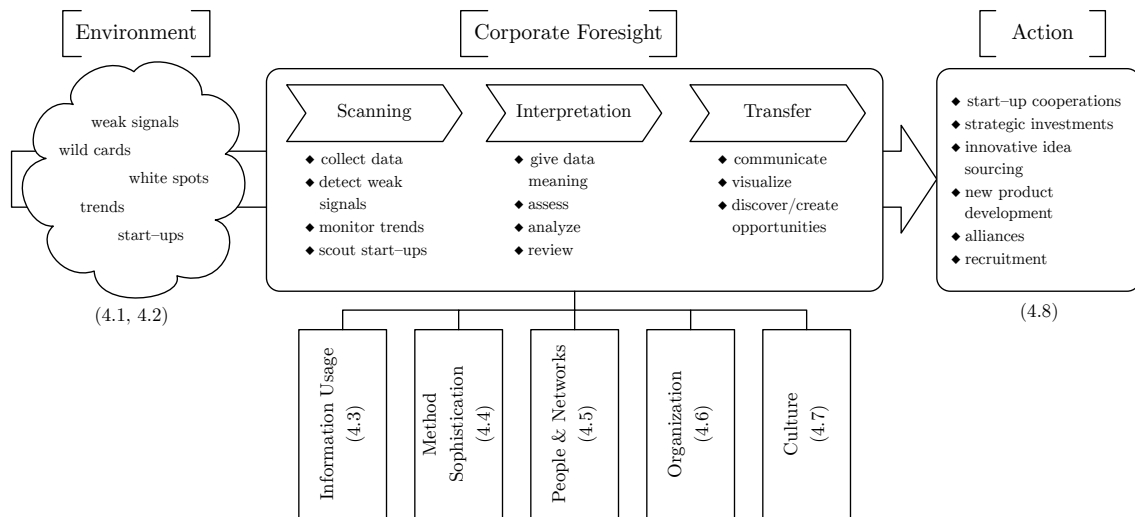


Figure 2.4: Conceptual model of corporate foresight in the start-up context. Adapted from Daft and Weick (1984, p. 286), Horton (1999, p. 6), Voros (2003, p. 14), and Durst et al. (2014, p. 2)

CHAPTER 3

Methodology

3.1 Research Design

The research stream corporate foresight emerged only after 2000 and can therefore be considered as a relatively young but fast growing research area (Rohrbeck, 2012, p. 208). For research fields that are new and about which the knowledge is limited, a qualitative research design is recommended (Eisenhardt, 1989, p. 532). In order to gain a close understanding of the research context and an understanding of the meanings humans attach to the specific area of interest, an inductive approach is applied (Saunders et al., 2009, pp. 126). Eisenhardt (1989) advises that such research logic should entail no predefined assumptions or hypothesis but could build on defined constructs that are then tested within the research (Eisenhardt, 1989, p. 536). In addition, Yin (2009) encourages the researcher to build upon theoretical frameworks in order to focus and direct the research and ensure an appropriate and thorough data collection.

As the research aims at exploring new insights and assess corporate foresight in a new light—the start-up context—an exploratory study approach is used. It is particularly useful if the researcher wants to clarify the understanding of a problem and has a great advantage of being flexible and adaptable to change as a result of new data and new insights that appear (Saunders et al., 2009, pp. 139–140). Thereby semi-structured expert interviews in a survey approach were used as main data source. As suggested by Flick (2007), explorative expert interviews are particularly suited for the orientation and structuring of a new research field (Flick, 2007, p. 216).

3.2 Selection

According to Cooper and Schindler (2014), purposive judgment sampling is appropriate especially for exploratory studies where the researcher aims at acquiring new insight into a specific phenomena. In addition, a selection of participants that are particularly informative is suggested by Cooper and Schindler (2014, p. 359) as well as by Saunders et al. (2009, p. 237). As a consequence, judgement sampling was applied for the selection of the interview participants. For the expert interviews only established companies which already had start-up focused corporate foresight processes in place were approached. Furthermore established companies were defined as those with more than 100 employees, existing for more than 5 years and having sales in excess of \$3 million, i.e. €2.65 million, as formerly proposed by Peterson et al. (2008, p. 355). These criteria assured that the participants had already noteworthy experience of corporate foresight and were able to contribute to the objectives of the research (Saunders et al., 2009, p. 239).

Potential interviewees were approached mainly through referrals of the supervisors. Aside from that, participants were also recruited on innovation conferences such as the Innovation Roundtable Berlin¹ (16 April 2015) and the XXVI ISPIM Innovation Conference² in Budapest (14–17 June 2015) as well as through direct contact establishment on LinkedIn³. The inductive approach of the thesis implies that the study of a small sample of subjects is more appropriate due to the specific focus on the context in which foresight activities take place (Saunders et al., 2009, p. 126). In total 15 potential interviewees were contacted, whereupon 10 agreed to participate in the research. All participants were experts in the field of corporate foresight and working at established companies in different industries (see Table 3.1).

3.3 Data Collection

This research used semi-structured interviews as main data collection technique as they are particularly suitable for exploratory study approaches, according to Saunders et al. (2009) and Flick (2007). The interviews were conducted at one point of time (cross-sectional) in the time span from June to August 2015 and lasted between 20 and 45 minutes. 9 out of the 10 participants were interviewed by phone

¹For more information see: www.innovationsplattform.berlin

²For more information see: www.conference.ispim.org

³For more information see: www.linkedin.com

| Company | Industry | Country |
|---------|------------------------------------|---------|
| C01 | Railway transportation & logistics | Germany |
| C02 | Telecommunications | Germany |
| C03 | Innovation research | Germany |
| C04 | Insurance | Germany |
| C05 | Applied research | Germany |
| C06 | Personal care & adhesives | Germany |
| C07 | E-commerce | Germany |
| C08 | Engineering & electronics | Germany |
| C09 | Applied R&D | Belgium |
| C10 | Automotive | Germany |

Table 3.1: Interview participants

or Skype due to logistic reasons. Since this method offers the opportunity to conduct more interviews within the same time frame and recruit participants from a wider geographic area, it is ultimately able to increase the quality of the interviews (Cooper and Schindler, 2014, p. 153). One interview was conducted as a face-to-face meeting in Berlin. There was no perceived different interviewee behavior or answers between both interview methods.

Prior to the interviews a list of themes and questions was developed, although these varied from interview to interview given the specific context. The interview guideline was based on the conclusions from literature review and were pre-tested with the foresight research experts from the participating companies C03 and C05. This approach allowed to discuss the structure and to further include recent findings as well as emerging topics of corporate foresight research. See Appendix A for the complete interview guideline.

The majority of the interview questions were formulated in a neutral and value-free way in order to let the participant reflect without any predefined direction. In the following a few specific questions directed to in-depth aspects of corporate foresight in the start-up context were asked. The interview guide consisted of about 9 themes, each of it including approximately 3–4 sub-questions addressing objective issues such as foresight activities, environmental scanning, managerial responses and trends. One of the main questions was designed as a critical incident interview question, in which the participants were asked to describe a specific example of the companies' most recent start-up collaborations (Saunders et al., 2009, p. 332). This type of question was used to get an in-depth insight in the start-up-focused foresight activities, the

involved motivations and issues as well as the managerial actions.

In order to ensure the participants a comfortable and open discussion, I let the interviewees choose their interview medium and place. At the beginning of each interview I tried to establish an easy and warm atmosphere by chatting and making small talk first. In the following I introduced the topic of the present thesis and informed the participants about the anonymization process of the study. After consultation and permission of the participant I started the audio-recorder. During the interview I used the interview guide to stick to the overall objective and the specific data collection aim of the research. However, the questions were asked according to the nature of the conversation in order to keep a comfortable rapport going. I encouraged spontaneous and rich answers and used follow-up questions in order to clarify aspects of the participants' answers. Specifying questions to probe answers and silence was used to encourage participants to further elaborate on short answers. Furthermore I tried to engage in active listening by using non-verbal responses, but also verbal agreements when conducting the interview on the phone. I also offered to share more details about the aim of this thesis and answered any upcoming questions at the end of each interview.

The interviews were recorded by audio-recording as well as by taking notes due to the nature of the questions and the ensuing discussion. 8 participants gave the permission to audio-record the interview, whereas 2 interviewees did not allow an audio-recording and had therefore solely to be recorded by note taking. During the audio-recorded interviews I noticed that the participants forgot after some time that they were recorded and switched to a normal and unrestricted conversation. Further note making during all interviews helped to clarify certain aspects of the interview, to explain specific answers and to gain a deeper understanding. Subsequently the interviews were transcribed in order to ensure a valid qualitative data analysis.

3.4 Data Analysis

The transcription of the interviews was followed by the data analysis using computer aided qualitative data analysis software (CAQDAS). For this task the software 'MAXQDA 11' was used. In order to ensure credible interpretations of data and plausible as well as defensible conclusions, the Gioia methodology was chosen for the analysis (Gioia et al., 2013, p. 15). According to the authors, this methodology is

designed to bring ‘qualitative rigor’ to the conduct and presentation of especially inductive research. The Gioia methodology’s data analysis is a combination of open and axial coding and consists of the following steps:

1. Perform initial data coding, maintaining the integrity of 1st-order (informant-centric) terms,
2. Develop a comprehensive compendium of 1st-order terms,
3. Organize 1st-order codes into 2nd-order (theory-centric) themes,
4. Distill 2nd-order themes into overarching theoretical dimensions, and
5. Assemble terms, themes and dimensions into a data structure (Gioia et al., 2013, p. 26).

The data analysis of the present thesis started with an initial open coding right after the first few interviews and was continued afterwards as suggested by Gioia et al. (2013). This enabled an adaption of the themes of the interview guide based on first informant responses. In the 1st-order analysis the interview transcriptions were read and then broken down into fragments or quotations and given a so-called code, whereas an adhering to informant terms was crucial (Gioia et al., 2013, p. 20). Initially 145 1st-order categories emerged from the interviews. As the research progressed, similarities and differences among the many categories were identified and the number of categories was subsequently reduced to a more manageable number (112). For example the initial codes of ‘feedback loop’, ‘assessment’ and ‘expert review’ were distilled into the category of ‘start-up assessment’. In the 2nd-order analysis, emerging themes suggesting concepts that helped to describe and explain the research goal were identified. A particular focus was set on nascent concepts that were not referred to in the existing literature. For instance, ‘start-up partnering’ and ‘embracing failures’ are example of such 2nd-order themes that emerged during this research.

Once a workable set of themes and concepts was established (also termed ‘theoretical saturation’), the emergent 2nd-order themes were further distilled into 2nd-order ‘aggregate dimensions’. The full set of 1st-order terms and 2nd-order themes as well as the aggregate dimensions are the basis for building what Gioia et al. (2013) calls a ‘data structure’. The data structure allows to configure and visualize the data and provides a graphic representation of the progression from raw data to terms and subsequently themes (Table 3.2 shows the exemplary data structure for the

| 1-st Order Concepts | 2-nd Order Themes | Aggregate Dimensions |
|---|--------------------------|----------------------|
| Development of accelerator programs for start-ups | | |
| Opening of incubator structures for start-ups | Money-based actions | |
| Establishment of venturing units | | |
| Making direct investments in start-ups | | External use of |
| Integration of start-ups into relevant business units | | foresight outcomes |
| R&D collaboration with start-ups | Partnering | |
| Close cooperation with start-ups | | |
| Partnering with start-ups | | |
| Support of R&D with market knowledge | | |
| Introduction of new business models | | |
| Exploration of new business fields | Active business support | |
| Development of new products or services | | |
| Adjustment of current products or services | | Internal use of |
| Databases | | foresight outcomes |
| Visualizations | | |
| Reports | Knowledge representation | |
| Corporate blog | | |
| Trend profiles | | |
| Start-up assessments | | |
| Newsletter | | |

Table 3.2: Exemplary data structure for the ‘foresight outcomes’ dimension

‘foresight outcomes’ dimension). According to Gioia et al. (2013), this represents the key component of demonstrating rigor in qualitative research (Gioia et al., 2013, p. 20). The complete coding table is located in Appendix B.

3.5 Research Credibility

In order to ensure a high-quality qualitative research, several important aspects have to be taken into account. For qualitative research four dimensions to judge the quality of the research design and the quality of its execution can be identified (Marshall and Rossman, 1989; Saunders et al., 2009):

- *Generalizability* defines the applicability of the findings to another context (Saunders et al., 2009, p. 145).

- *Credibility* refers to an accurately identification and description of the subject (Marshall and Rossman, 1989, p. 145).
- *Dependability* accounts for changing conditions as well as changes in the design by increasingly refined understanding of the context during the research (Marshall and Rossman, 1989, p. 146–147).
- *Reliability* refers to the extent to which the research can be repeated with consistent findings (Saunders et al., 2009, p. 156).

A sound qualitative study should account for these concerns and develop appropriate tactics to overcome these issues (Marshall and Rossman, 1989, p. 147). During this research a set of actions were undertaken in order to overcome data quality issues, which will be presented in the following.

If we consider *generalizability* first, it becomes apparent that due to the small and unrepresentative number of participants the research may lack generalizability. The assumption behind qualitative research is that the circumstances to be explored are complex and dynamic. Therefore qualitative research using semi-structured is not intended to make statistical generalizations about the entire population as it heavily depends on the context of the research (Saunders et al., 2009, p. 327–328). However, a research design with multiple informants from different organizations, which is the case in the present thesis, can greatly strengthen the study’s usefulness for other settings (Marshall and Rossman, 1989, p. 146).

Regarding the *dependability*, it is the job of the researcher to account for changes in the context also in the research design and setting. In the present research it was tried to make all changes explicit and comprehensible to the reader. The same accounts for the *credibility* of the study, whereas an in-depth description of the setting, population and theoretical framework is able to strengthen the credibility of the research (Marshall and Rossman, 1989, p. 145).

In order to enhance the *reliability* of the research, notes related to the research design, the reasons underpinning the choice of strategy and methods were made and retained as well as the collected data was archived. This fostered transparency in the processes and findings of the research and will enable other researchers to understand and re-analyze the collected data (Marshall and Rossman, 1989; Saunders et al., 2009).

However, the researcher must provide controls for bias in interpretation (Marshall and Rossman, 1989, p. 147). In order to minimize participant bias, which refers to the participant's overestimated presentation of the phenomena, only highly knowledgeable informants were chosen and critical incident questions were asked during the interviews. Especially the consultation with research experts for the interview guide was intended as a preceding control mechanism. Combined with a sound preparation for the interviews as well as neutral comments, tone and non-verbal behavior of the interviewer reduced the observer bias. All interviews were conducted by the same researcher with an pre-developed list of themes to be covered, which enabled to counter observer error. The interviews were subsequently transcribed and then coded using CAQDAS. CAQDAS does not only save time and increase flexibility, but leads also to an enhanced transparency between between the researcher and the transcribed data, and improves therefore the validity, trust and auditability (Saunders et al., 2009, p. 514).

CHAPTER 4

Results

In this chapter the results from the expert interviews will be presented. During the process of interview coding ten aggregate dimensions emerged, which I will use to describe the findings in the following. For each dimension the most commonly used themes and codes as well as the most interesting ones are described. I also paid attention to differing perspectives and will highlight several contrary opinions in the following sections. Quotes from interviewees will illustrate specific points and interesting issues. Due to the detailed coding and the resulting amount of codes and themes, I will not describe all the codes in detail in this section (see Appendix B for the complete coding table). The findings include answers to the elaborated research question which deals with the integration of start-ups into the corporate foresight activities and the identification of hurdles, barriers and needed adjustments to current foresight activities. Thereby Rohrbeck's (2010) maturity model of corporate foresight with the dimensions of *information usage*, *method sophistication*, *people and networks*, *organization*, and *culture* alongside with the themes emerged from the coding will be used as a guideline to highlight the difficulties among the different dimensions. In the following, I will start with the market environment and the perceived role of start-ups in the foresight process. Subsequently, codes and themes regarding the dimensions of Rohrbeck's maturity model are presented. Lastly, different foresight outcomes as well as trends in the area of corporate foresight are highlighted. The order of the different sub-sections does not imply more frequent mentions of the topic in comparison to the other categories.

4.1 Market Environment

The participants stated that due to a *high market dynamism* and *low entry barriers* new products arose frequently and new competitors were a constant threat to the established companies. For instance, one interviewee from the e-commerce business area described the market environment as follows:

*“Due to the market environment and the movement in the market there is a very dynamic development. That’s also due to the e-commerce, which is a very young market. Perceived there are fairly low entry barriers.”*¹

Furthermore also *shorter innovation cycles* were identified as a factor that intensified the competition and made firms’ existing product or service portfolio less secure. Especially start-ups were able to benefit from these circumstances. The changed market conditions enabled start-ups to capture market shares from established companies more easily or even to disrupt the current market structures. As a result, the participating companies had to consider start-up as serious competitors which led to a further integration of start-ups into their corporate foresight activities.

The *industry amalgamation* was identified as another environmental factor that caused companies to change their corporate foresight techniques. As more and more companies from adjacent business areas were entering their core market, the participating companies had to consider firms not only from their core business area but also from distant business areas as potential competitors. As a result, companies extended their environmental scanning activities to adjacent business areas as well as to possible white spot areas. For instance, one practitioner described this effect as follows:

*“We noticed that more and more distant companies are entering the insurance market. In the future, for example, manufacturers of self-driving cars could incorporate the entire liability package into their product portfolio.”*²

Another reason for the integration of start-ups into the corporate foresight activities that emerged from the interviews was the *high activity of venture capitalists (VCs)*. Nowadays risk capital allows small firms and start-ups to become global players

¹Translated by the author. Original quote: “Aber es gibt durchaus aufgrund des Marktumfeldes und auch der Bewegung am Markt eine sehr dynamische Entwicklung. Das ist halt geschuldet dem E-Commerce, ein sehr, sehr junger Markt. Es gibt da auch gefühlt recht niedrige Einstiegsbarrieren.”

²Translated by the author. Original quote: “Wir haben bemerkt, dass immer mehr andere Anbieter in das Thema Versicherung hineinragen. Zum Beispiel könnten zukünftig Autoanbieter, die die Technik des selbstfahrenden Autos anbieten, das ganze Haftungspaket praktisch in deren Dienstleistung mit übernehmen.”

in months. As stated by one interviewee, the large financing rounds of start-ups led mainly by VCs enabled start-ups to compete on par with big corporations. By aggressive marketing and price-dumping, a fast establishment and diffusion of new business models could thereby be fostered. Without large financing rounds such aggressive mechanisms would have been able only to a smaller extent. As a consequence, the participating companies had to use appropriate informations sources for the start-up focused corporate foresight activities (see ‘follow the money’ approach in section 4.3).

In conclusion, it can be said that start-ups benefited from the changed market environment and caused subsequently established companies to consider start-ups as serious competitors. As a result, the participating companies started to integrate start-ups into their corporate foresight activities. Further roles which were attributed to the start-ups will be described in the following section.

4.2 Role of Start-ups

There were several codes grouped into the category *role of start-ups*. First of all, the majority of the participants highlighted the importance of integrating relevant start-ups into the corporate foresight activities. According to one participant, this was not the case a couple of years ago, but had recently changed to the better:

“Because in the past they [start-ups] were simply not taken seriously. It was thought that they were not a competitor for a big enterprise.”³

Even big cooperations have nowadays turned to start-ups, because they have recognized the potential threat of being disrupted by such new and small ventures. Start-ups are viewed as *competitors* and are therefore included also into the foresight activities by most of the participating companies. In general, the opinions of the experts regarding the role of start-ups were quite dispersed. Although most participants stressed that start-ups are considered noteworthy, some interviewees stated that they are more interested in the market dynamics of the business environment than the start-ups itself. For instance, one participant noted that a start-up itself was not of value for the company. It was rather the market place with its new ideas, trends and new technologies which were interesting for the company. Nevertheless, the most prominent theme emerging from the interviews was *start-ups as idea sources*.

³Translated by the author. Original quote: “Weil früher hat man sie [start-ups] einfach nicht ernst genommen. Man dachte, die wären keine Konkurrenz für einen Riesenkonzern.”

The experts agreed that start-ups were a good way to source new and innovative ideas. Due to their small size and linked high flexibility, start-ups could quickly test new ideas on the market. Accordingly, one interviewee was the following opinion:

*“Based on our core business we identify new ideas in that area, monitor new developments and selectively engage and expand the identified ideas. And thereby start-ups are just a very good indicator of new ideas.”*⁴

One interview participant described start-ups as *“precursors of new trends”*⁵. Accordingly, another role of start-ups which as mentioned by the experts, was the role as a *trend-setter*. By looking at start-ups foresighters could get a good overview on current as well as future trends in the market environment. However, as one expert noted, trends could be only temporary. Many of these trends were a bit too hyped and the company had to rigorously assess if the trend was actually worth pursuing.

Besides the passive roles of start-ups as idea sources or precursors of new trends, companies also actively used start-ups for *market testing* endeavors. Especially in the digital age it became very easy for start-ups to launch new ideas on the market. By spinning off new ventures into independent start-ups, companies tested new products or business models on the market and were able to get thereby a proof-of-concept. The agility of start-ups allowed companies to quickly test new ideas at a low risk and could in the worst-case easily shut down these start-ups when they posted losses. However, not all business environments were suited for such market testings, as stressed by one participant. For instance, markets where trust is highly valued by customers were supposed to be not a good environment for such market testings.

A further role of start-ups that was mentioned during the expert interviews was *start-ups as recruiting tools*. The respective interviewee reported that the company was collaborating as well as acquiring start-ups in order to get in contact with creative and young high-potentials. Start-ups were a way to make the company more attractive especially for young professionals and graduates. Thereby the ultimate goal behind this approach was to recruit skilled and motivated high-potentials for the company.

⁴Translated by the author. Original quote: *“Wir haben halt unser bestehendes Kerngeschäft und sind dabei zu gucken, was gibt es da eigentlich, beobachten das erst mal, sind dann selektiv aber auch dabei, das zu erweitern. Und da sind Start-ups einfach ein sehr guter Indikator, was an neuen Ideen kommt.”*

⁵Translated by the author. Original quote: *“Vorboten neuer Trends”*

4.3 Information Usage

Besides the traditional information sources for corporate foresight such as *news*, *private and corporate blogs* as well as *scientific articles*, participants pointed out to the importance of new and innovative information sources for foresight in the start-up context. In the case of scientific sources one interviewee stated that:

*“[...] if you have too many scientific sources, then there is the danger that it for us is too low on the maturity level. You have to somehow find the balance.”*⁶

However, these traditional data sources were still of relevance for the corporate foresight activities, but the participants identified other sources as more appropriate information sources for start-ups. For instance, one prominent emerging code in that context was *social media platforms as data sources*. The experts highlighted that social media platforms were especially suitable for the information gathering in the start-up context. One participant pointed out that social media platforms were not only a way to passively collect data about a specific trend or new start-up, but they were also a way to actively engage with the community and to collectively discuss a specific phenomena. For instance, a participating company used the social media platform Twitter to identify upcoming trends and subsequently used its chat mechanism to collect the opinion of the community about the identified future developments. Thereby, the company was able to identify future trends as well as future customer needs, which were subsequently integrated into their corporate foresight processes. Also *crowd-funding platforms* were reported as appropriate information sources for the identification of new trends among the customers. By looking at crowd-funding campaigns participating foresighters were able to get a look at upcoming products of start-ups before the market launch and could therefore anticipate with managerial actions.

Another information gathering approach that emerged from the expert interviews was the ‘*follow the money*’ approach. By tracking the investments of certain VCs as well as by tracking new financing rounds of start-ups, foresighters were able to identify potential new competitors and potential new business model trends in a timely manner. One participant described this approach as it follows:

“We look at individual VCs, where are they investing? But also at incubator teams, where are they taking shares? [...] We try to always have a look at them, because

⁶Translated by the author. Original quote: “[...] wenn man zu viele wissenschaftliche Sachen drin hat, dann besteht die Gefahr, dass es von der Reife her für uns zu gering ist. Da muss man irgendwie auch die Balance finden.”

*depending on how large the valuations and the financing rounds are already, these are issues then, where we know, ok these are the next big things.”*⁷

Moreover, several interviewees stated that they were participating in *venture capital funds* in order to enhance their start-up scanning activities. This approach allowed them to access the deal flow and insights of the VCs firm and thereby increase the number of screened start-ups up to 1,000 per year. Another participating company offered an *acceleration program* to start-ups with the overarching goal to keep track of what start-ups were doing in their business domain and industry. Nevertheless, the personal network to *thought leaders* and *stakeholders* in the start-up ecosystem was highlighted as a crucial information channel for start-up focused corporate foresight activities by the practitioners.

Also *start-up contests*, *hackathons* and *start-up fairs* were named as suitable information sources for corporate foresight in the start-up context. According to one interviewee, contests and hackathons allowed to get an overview of potential new ideas for a certain business area or issue. The creation of opportunities was carried out outside the company, whereas the selection from among the opportunities happened then inside the established firm. This enabled an outsourcing of problem solving and a subsequently overview of different opportunities. Start-up fairs on the other hand, were able to identify current start-ups in a specific business area and to built up a network with them. For instance, managers of one participating company used such fairs to establish partnerships or collaborations with start-ups:

*“And then there is the ‘Lange Nacht der Start-ups’ event. In cooperation with external companies and the T-Labs it has emerged as a fair for startups and is now regarded as Europe’s largest start-up fair. Our managers are invited to the fair to get a look at start-ups and to establish potential partnerships with them.”*⁸

Nevertheless all the new information sources, the majority of the participants agreed that the *personal network* as well as the *network of scouts* were the most important information sources for corporate foresight in the start-up context. Scouts were described as experts in a specific field and a specific geographic location,

⁷Translated by the author. Original quote: “Wir schauen uns einzelne VCs an, wo investieren die? Aber auch Inkubatoren-Teams, woran beteiligen die sich? [...] Da auch immer einen Blick drauf zu haben, weil je nachdem wie groß die Bewertungen und die Runden dann schon sind, sind das Themen, wo man weiß, ok das ist eine größere Hausnummer.”

⁸Translated by the author. Original quote: “Und dann gibt es noch die Lange Nacht der Startups. In Kooperation zwischen externen Unternehmen und der T-Labs ist eine Messe für Startups entstanden und wird heutzutage als Europas größte Startup Messe angesehen. Auf diese Messe werden natürlich auch Deutsche Telekom Managers eingeladen, um sich die Startups anzugucken und womöglich potentielle Partnerschaften zu knüpfen.”

which were contacted by the participating companies in order to get an external expert advice on a certain topic or specifically on a certain start-up. In addition, these scouts were contacted for the identification of relevant start-ups as they were highly knowledgeable insiders of the local start-up scenes. According to one expert, scouts were able to capture more contextual information which led ultimately to a rich understanding of the phenomena. In conclusion, as one participant put it, “*networking, networking, networking and be open-minded*”⁹ were the most important tasks and characteristics when integrating start-ups into corporate foresight.

But not only external information sources such as scouts were mentioned during the interviews. One participant stated, that actually the employees itself were their key foresighters (*employees as key foresighters*). They were already experts in the operating business area and had therefore a good sense for upcoming trends and potential disruptions. The participating company had an internal suggestion system, where they could enter interesting start-ups as well as upcoming trends. Thereby corporate foresight was able to use the *knowledge of the crowd* as input to foresight activities. *Company-wide awareness* as well as the right *employee incentivitation* were critical success factors for such a system, according to the interviewee.

4.4 Method Sophistication

When asking the participants for methods they use for corporate foresight in the start-up context, they mentioned several different methods. It became apparent, that the different methods were chosen regarding the purpose and the specific context of the foresight activities. According to the interviewees, the most prominent methods were *radars* with different strategic focuses and *scenario analyses*. For instance, several participating companies used *start-up radars* to identify and evaluate emerging start-ups and to provide an overview of the relative maturity and the relevance to the company. One participant described the start-up radar as follows:

*“The more systematic model is the start-up radar, where we say that every three months we publish a new radar. We have a systematic screening, which runs along in the background and is then evaluated on the reporting dates with the aim to look at what is actually going on in the start-up scene.”*¹⁰

⁹Translated by the author. Original quote: “*Networking, networking, networking und offen für Neues sein.*”

¹⁰Translated by the author. Original quote: “*Das systematischere Modell ist aber der Start-up Radar, wo wir sagen, wir haben dann Turnus, dass wir alle drei Monate einen neuen Radar veröffentlichen. Wir haben dann auch ein systematisches Screening, das im Hintergrund mitläuft*”

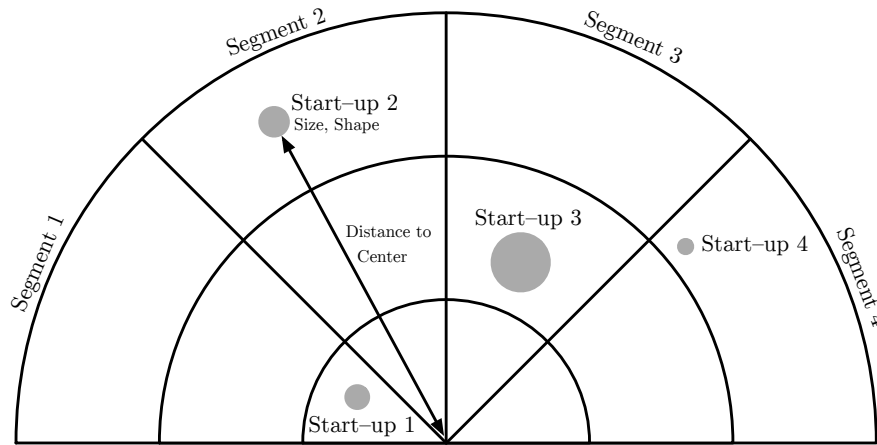


Figure 4.1: Illustrative example of the start-up radar

The start-up radar, as visualized in Figure 4.1, generally included the following three dimensions: segments, maturity stage and relevance. Segments were used to categorize the strategic search fields. For instance, segmentation were based on business areas or trends (e.g. second-hand shopping or smart home). The maturity stage indicated the sophistication of the start-up's business model and was operationalized by the distance of the circle to the center. The relevance was indicated by the size and shape of the respective icon on the radar. For example, the bigger the icon on the start-up radar, the bigger was the impact of the start-up on the current business of the established company. With its consistent structure and focus on the mostly relevant information, the start-up radar was a valuable tool for communicating and discussing the start-up focused corporate foresight insights internally, as stated by the participant.

Besides start-ups, the participant companies viewed trends as important drivers of their businesses. This was also reflected in the selection and usage of appropriate foresight methods. As a result, many participating foresighters were using trend analysis and trend radars as a starting point for their start-up focused foresight activities. The *trend radar* was similar to the start-up radar and had the aim of identifying relevant trends and assessing their impact on the company. The participants highlighted the importance of *communicating the results of corporate foresight* internally into the company as well as externally with suppliers or partners. In order to foster the communication of results, one participating company introduced

und dann zu den Stichtagen ausgewertet wird und wo wir uns dann anschauen, was eigentlich los ist in der Start-up Szene."

a *corporate blog*. The blog was used to publish articles about upcoming trends and new start-ups and was accessible to all employees. Furthermore the employees were able to comment on the posts and thereby engage and contribute to the foresight activities. The participant stated that the internal blog enhanced the employees' awareness for the corporate foresight and increased the visibility of the corporate foresight department's work. Another mechanism to internally communicate the foresight results that was mentioned during the interviews was the *newsletter*. This enabled the foresighters to periodically send out the newest results and insights from the corporate foresight activities.

Regarding the scope of the corporate foresight methods used in the start-up context, there was a predominantly opinion among all participants. The focus was clearly set on the *core business* but foresighters were encouraged also to look at developments in *adjacent business areas*. For instance one interviewee described their approach as follows: “*We focus on the core business, but look also partly a bit beyond the obvious*”¹¹. However, as already mentioned previously, many practitioners set first the focus of corporate foresight activities on trends and only integrated subsequently start-ups. For instance, one practitioner described their approach as it follows:

*“Hey, that’s the trend. That is our role in it. We are looking for a start-up, if we do not want to make it yourself, which will help us on to jump on this trend.”*¹²

4.5 People and Networks

The participants agreed upon the importance of the *networking skills* for the corporate foresight activities. According to one expert, for the scanning activities the external network, i.e. connections to the community stakeholders, thought leaders and experts, played a very important role because it allowed quickly to identify relevant start-ups even if they were at a very early stage. As start-ups tended to spread not a lot of information in early stages, it would have been hard to get to know them without the personal network. For instance, one participating company relocated four employees to a co-working space in Berlin in order to expand the network to start-ups and potential partners. An extensive and broad network allowed an easy search and location of the right experts for a certain issue, according to the interviewee.

¹¹Translated by the author. Original quote: “*Wir konzentrieren uns auf’s Kernbusiness, aber gucken auch teilweise ein bisschen außerhalb des Tellerrandes.*”

¹²Translated by the author. Original quote: “*Hey, das ist der Trend. Das ist unsere Rolle darin. Wir suchen ein Start-up, wenn wir’s nicht selbst machen wollen, welches uns hilft auf diesen Trend aufzuspringen.*”

Accordingly, the key task of the participating foresighters was to establish a network in the start-up scene. It became apparent during the interviews that foresighters had to actively approach start-ups and engage with them in order to build up a lasting relationship. One expert stated that if start-up did not see the return or benefit of the network, they would not participate in it. Therefore the participants used start-up contests, hackathons and start-up fairs to build up a start-up network and sought the vicinity to start-ups by working from co-working spaces. One participating expert highlighted his main tasks as follows:

*“Contacts and talking about the respective business areas, recognize what is happening. What is going to be a success? Simply linger in the market environment.”*¹³

When looking at the preferable characteristics of start-up foresighters, the interviewees stated *being open-minded* and *being curious* as a crucial characteristics. The foresighters had to look beyond the obvious and to not being limited to the current business model and industry. Furthermore *creativity* and *idea generation* was rated also as an important skill. Foresighters were supposed to come up with own new ideas and push them further in the company. Only thereby it was able to get management attention for new projects and possible start-up partnerships, according to one interviewee. Moreover it became apparent that *interdisciplinarity* together with *internationality* were important prerequisites for an effective and successful foresight unit. One participant described the characteristics of his co-foresighters as follows:

*“Our 10 foresighters come from 6 different nations. They are chemists, engineers and economists with very different professional experience. Some come straight from university, others have up to 22 years of professional experience behind them. So the characteristics are very different and the diversity of the team is very important.”*¹⁴

4.6 Organization

When investigating the organizational setting of corporate foresight, most of the participating foresighters reported that the top-management of the respective company had a high interest in the start-up focused foresight activities. *“It is the case*

¹³Translated by the author. Original quote: *“Kontakte und das Reden über die jeweiligen Geschäftsfelder, erkennen, was passiert. Was wird erfolgreich? Sich in diesem Marktplatz aufzuhalten.”*

¹⁴Translated by the author. Original quote: *“Unsere 10 Foresighters kommen aus 6 verschiedenen Nationen. Da sind Chemiker, Ingenieure und BWLer dabei mit sehr unterschiedlichen Berufserfahrungen. Manche kommen direkt von der Uni, manche haben bereits 22 Jahre Berufserfahrung hinter sich. Also die Eigenschaften sind sehr unterschiedlich und die Vielfältigkeit dieses Teams ist ganz wichtig.”*

*that these things have a high management attention”*¹⁵, reported one informant. In part the top-managers actively engaged themselves in the foresight activities. For instance, the CEO of one participating company was the key driver behind the corporate foresight in the start-up context. However, as pointed out by another interviewee, it was crucial that the top-management allowed the respective foresighters enough *freedom to operate* in order to search and to be active also in non related business areas. Summing up, the start-up focused corporate foresight activities of the participants were mainly driven by a *top-down approach with high attention from the top-management*.

The *integration with other processes* and the collateral *formal diffusion of insights* was highlighted by the participants as very important for the value contribution of corporate foresight. The insights gained through the corporate foresight processes were further integrated into other processes such as strategy formulation or project assessment. Therefore a *company-wide accessibility* of the corporate foresight insights and results turned out to be very important. For instance, one participant noted that the insights from their foresight activities were used also in other units of the company:

*“We note in particular that strategy units in the national companies [subsidiaries] as well as in the headquarters make use of our database to confirm their projects and visions and, of course, to define future focal areas.”*¹⁶

The participating companies used internal databases and platforms as well as the already mentioned corporate blogs and newsletters to diffuse the insights into the company. One interviewee reported that the foresight insights were posted in a distilled form on the corporate social network in order to enhance the awareness and the accountability of employees for detecting discontinuities and start-ups.

Regarding the process organization of the corporate foresight activities in the start-up context, it became apparent that the majority of the participating companies carried it out on a *quarterly basis*. For example, one interviewee stated that the environment was scanned and thereby information gathered on a continuous basis, but the analysis and interpretation of the data was done only at the end of each

¹⁵Translated by the author. Original quote: “*Es ist so, dass diese Dinge eine hohe Management Attention haben.*”

¹⁶Translated by the author. Original quote: “*Wir merken vor allem, dass Strategieeinheiten in den National Companies [Tochterunternehmen] als auch im Headquarter unsere Datenbank nutzen, um ihre Projekte als auch Visionen zu bestätigen und natürlich auch zukünftige Fokusbilder zu definieren.*”

quarter. Thereby the start-up radar was updated with new entries or revised ratings. The participants identified the *review* and *feedback loop* before the actual release of the insights as crucial process steps. These control mechanisms fostered a discussion and ensured thereby a high quality of the foresight results. For instance, one interviewee mentioned that the scouts were included in the final review in order to get a second expert opinion and to guarantee the accuracy of the results.

4.7 Culture

For the awareness of start-ups and a subsequent integration of them into the corporate foresight process, the company culture played an important role. The participants pointed out that an *entrepreneurial orientation* was necessary to proactively identify innovative start-ups even in distant business areas. As already mentioned in section 4.5, the right mindset was a crucial prerequisite for corporate foresighters. The corporate culture, in turn, was reported to have a substantial influence on the mindset. According to the interviewees, the corporate culture had to encourage *flexibility* in order to not only focus on the current core business but consider also emerging trends and weak signals. Furthermore it had to embrace an ‘*open for new ideas*’ mentality to constantly foster new ideas and to allow an imagination of the bigger picture. For instance, foresighters at one participating company were expected to come up with own new ideas for new products and services. In contrast, another company fostered a ‘*partnering for innovation*’ mentality. The key task of the respective foresighters were to identify possible partnerships with start-ups in order to strengthen the core business and to explore new growth opportunities. Another practitioner emphasized a *sharing culture* as an important prerequisite for the successful diffusion of foresight results throughout the company. According to the interviewee, information is not valuable unless it is shared with the right person:

*“Information will no longer have a value if you do not share it. The ‘knowledge is power’ mindset from the previous generations is still present in our company. But we are rather the generation that says, what you do not share, has no value.”*¹⁷

Nevertheless the development toward a modern corporate culture, participants reported that *control mechanisms* acting as quality and controlling gates of new ideas

¹⁷Translated by the author. Original quote: “Die Informationen haben an sich keinen Wert mehr, wenn man sie nicht teilt. Die ‘Wissen ist Macht’-Einstellung aus den vorherigen Generationen ist bei uns im Laden noch häufig da. Aber wir sind ja eher die Generation die sagt, was man nicht teilt, hat keinen Wert.”

and projects were important. For example, one practitioner described the company's culture as following:

*“Our corporate culture is more in the direction that we have 1,000 ideas, but then have to focus on the top and push only the best forward. [...] At one hand you are encouraged to have ideas of what you want to do, and at the end you have only few resources and have to look that the topics, that you want to do, actually hold water. The topics have to have the right maturity in order to execute them.”*¹⁸

For instance, one interviewee stated that this mentality was reflected also in the start-up assessment. Due to the limited resources of the foresight unit and the huge amount of start-ups to consider, only the best were considered as of high relevance to the company and were subsequently integrated into the monitoring activities (e.g. *“With so many new ideas you need to have a rigorous process in order to say which start-up is interesting.”*¹⁹). The respective foresighters were very proud of their rigorous start-up assessments which led to a common understanding that only few start-ups were competitive enough to possibly disrupt the companies' core business.

Another important aspect of the corporate culture that emerged from the interviews was that employees were encouraged to *embrace failures*. It was pointed out by the experts that as the German mentality was not high in failure tolerance, the corporate culture had to foster the 'embracing failure' aspect in particular. For instance, one interviewee explained:

*“Above all, it must not be dignified when an experiment does not lead to success. You always have to foster failure tolerance, which is of course difficult, but is otherwise incriminatory for the self-esteem of the respective protagonists to endure that over time.”*²⁰

4.8 Foresight Outcomes

The interview contained one set of questions regarding the outcomes or results of corporate foresight activities in the start-up context. The practitioners synthesized

¹⁸Translated by the author. Original quote: *“Unsere Firmenkultur geht eher in die Richtung, dass wir 1000 Ideen haben, aber dann auf die Besten fokussieren müssen, die Besten umzusetzen. [...] Und das heißt sich halt ein bisschen, Ideen zu haben, was man machen will, und am Ende hat man aber nur wenige Ressourcen und muss gucken, dass die Themen, die man machen will, auch wirklich Hand und Fuß haben. Die Themen, die man machen will, müssen solange gerüstet werden, bis sie sitzen.”*

¹⁹Translated by the author. Original quote: *“Bei so vielen neuen Ideen muss man da schon einen rigorosen Prozess dahinter haben, um zu sagen, welches Start-up interessant ist.”*

²⁰Translated by the author. Original quote: *“Und vor allem darf es nicht ehrwürdig sein, wenn ein Experiment nicht zum Erfolg führt. So das ist natürlich schwierig, das kann man auch immer hochhalten, aber es ist natürlich für das Selbstwertgefühl der entsprechenden Protagonisten schwierig, das auf Dauer durchzuhalten.”*

the insights gained from the foresight activities into a written output. Among the most common outputs were *reports*, *visualizations*, *blog entries* and *databases*. The foresighters produced reports in form of *trend profiles*, *recommendations to the management*, *start-up assessments* or *impact analyses*. The information gained from the foresight activities were further included into *presentations* for internal use or visualized on *radars* such as the previously mentioned start-up radar. For instance, one participating company used an interactive start-up radar with an integrated start-up assessment behind each entry of the radar. Further outcomes were blog entries which presented the insights in form of journalistic articles. Another company entered the foresight outcomes into an internal database which was could be accessed by all employees and was further used in other units. The practitioners identified the *communication of the results* as a critical aspect of the corporate foresight process because it was, ideally, the launching point for managerial actions by the corporation.

The following paragraphs will address how the corporations used these outcomes gained from the corporate foresight activities. Thereby it could be distinguished between an *internal or external use* of the foresight results. The internal use referred to only an company-wide communication of the insights in a closed session. By doing so, the foresight results were used for the *development of new products or services*. Based on the corporate foresight insights, requirements and features of new product or services could be derived. Another corporate action was the *adjustment of current products or services* according to the identified changing customer needs or upcoming trends. In addition, managerial actions for the *exploration of new business areas* were triggered. New insights from the corporate foresight activities allowed a re-evaluation of emerging business areas and triggered, for example, a market entry of one participating company in a new business area. Also the *introduction of new business models* was mentioned by the practitioners as a managerial action that was based on the corporate foresight insights. One company identified start-ups with a subscription-based revenue model as emerging competitors by using the method of start-up radars and subsequently introduced a similar subscription-based business model. Another common internal usage of the corporate foresight results was the *support of R&D with market knowledge*. For instance, one participating company supported its R&D unit with upcoming customer needs and market knowledge in order to guide the development for new products and to meet subsequently real customer needs. The respective practitioner recounted:

“We work closely with the corporate research unit and make many projects together,

*in which we play a supportive role. That's exactly our focus, introducing external know-how early in the research and pre-development phase, which also means that we are closely networked with all suppliers.”*²¹

Interview participants mentioned the external use of foresight outcomes in *marketing efforts* as well as in *publications* and *conferences*. Insights from the corporate foresight activities were used to update advertising decisions, generate press texts and marketing collaterals. Furthermore corporate foresight results were used for publications in scientific and practitioner journals as well as for conference contributions. One participating company teamed up with scientific researchers from a technical university in order to constantly publish scientific articles about corporate foresight with its methods, benefits and value contributions. The feedback from the academic community allowed the company to steadily improve their corporate foresight processes and to ensure state-of-the-art foresight methods.

Another managerial action based on corporate foresight results and regarded to the external use is the *partnering with start-ups*. By doing so, the participating companies reported that a close collaboration with start-ups allowed to extend their core business with innovative solutions where both parties could benefit from. The range of partnerships with start-up ranged from *close R&D collaboration* for new products or technologies, up to a *fully integration of start-ups* into the respective business units in order to strengthen the firm's core business. For instance, one participating company reported that they were closely cooperating with start-ups in early stages and acting thereby as a sort of beta-customer in order to influence and ultimately to shape the development of their product or service from the beginning on.

Also *direct investments in start-ups* were triggered by insights gained from corporate foresight activities. In the most cases the practitioners reported that these 'cash for equity' deals allowed the company to act as an strategic investor in the start-up and to influence the development and growth of the start-up up to certain extent. For instance, one practitioner explained why the company invested in an start-up as follows:

“That was also an investment that was based on our start-up radar. That specific start-up was an issue where we discussed long and intensive. But we really went one

²¹Translated by the author. Original quote: “Wir arbeiten intensiv mit dem Corporate Research zusammen und wir machen viele Projekte gemeinsam, bei denen wir eine unterstützende Rolle spielen. Das ist ja genau auch unser Fokus, frühzeitig in die Forschungs- und Vorentwicklungsphase externes Know-How einbringen, das heißt wir sind stark mit allen Komponentengebern vernetzt.”

*step further and invested in it, because we saw that we had a great fit with our target group [...] and that it was simply a topic that we had not covered yet.”*²²

Another approach was to *open up accelerators/incubators for start-ups*. Thereby the companies provided start-ups with resources such as offices, technical infrastructure and mentors, and got start-up shares in return. Usually accelerators and incubators accepted start-ups with a focus on the core business areas of the company at an early stage and helped them to growth. The investing company got insights into the technology or product of the start-up and could subsequently integrate it in the respective business areas. One interviewee identified the *information exchange* between the investing company and the start-up as very important aspect. Only a steady information flow between the respective R&D unit and the start-up allowed the investing company to get an deep insight view into the start-up’s products and technologies. In practice this was hardly achieved due to resistance from the start-up (*“they are stealing our product/technology”*) as well as from the corporate side (*“not invented here syndrome”*).

4.9 Trends in Corporate Foresight

In the following trends in the area of corporate foresight that were mentioned by the participants or emerged from the data analysis will be presented. As already brought up in section 4.3, *social media platforms* were emerging as new and valuable information sources for the corporate foresight activities. Several interviewees were the opinion that social media platforms such as Twitter, Facebook or LinkedIn would play an even more important role in the future. For instance, one participant reported that the richer information sets as well as the earlier identification of discontinuities could improve the overall corporate foresight processes. Accordingly, increased development activities of the participating companies toward integrating social media platform as data sources into corporate foresight were identified. The usage of *social media platforms as collaborative tools* was pointed out by the interviewed experts as another emerging trend. According to the interviewees, the collaborative aspect of these platforms allowed to tap the intelligence of the crowd, the employees, and allowed further to increase the quality of trend identifications and start-up

²²Translated by the author. Original quote: *“Die Beteiligung ist auch aus einem Start-up Radar entstanden. Das Start-up war durchaus ein Thema, wo wir hart und lange diskutiert haben. Aber da sind wir dann wirklich auch weiter gegangen und haben uns dann auch beteiligt, weil wir gesehen haben, dass wir von der Zielgruppe her einen großen Fit haben [...] und dass es einfach ein Thema ist, das wir so noch gar nicht haben.”*

assessments. Therefore a deeper integration of social media platforms into the corporate foresight processes was wished by several interviewees. For instance, one participant stated thereby the following:

*“Then there is the internal social network, where we publish trends and where we trigger discussions. Of course we have our experts, but we want also to ask our community and thereby conduct a kind of crowd-sourcing. What does the community think about this trend? What is the potential behind it? That’s where we see the future.”*²³

The *automatization of foresight* was identified as a further trend in the corporate foresight area. The development of appropriate ICT-tools allowed to further automate steps in the corporate foresight process. The identification of start-ups, the monitoring activities as well as the early detection of weak signals and trends were rated by the participants as the most interesting activities of corporate foresight to get supported by ICT-tools. The participating companies did not have such foresight support systems yet in place, but indicated strong interests in further automating the foresight processes with the help of ICT-tools. However, one participant stressed that only a combination of established processes and ICT-tools would allow to further enhance the corporate foresight practices:

*“IT-tools need to be accompanied with processes throughout the company to work really well. That is why we strive for a combination of IT-tools with appropriate processes.”*²⁴

4.10 Summarized Findings

According to the previously described findings, the dynamic market environment with its high rates of change and its perceived low entry barriers enabled start-ups to compete with established companies. These started to integrate start-ups into their corporate foresight activities and further considered them as a way to source new ideas, to identify upcoming trends, to recruit high-potentials as well as a way to perform market-testings. However, the corporate foresight processes needed adaptations in order to include the start-up context.

²³Translated by the author. Original quote: *“Dann gibt es das interne Social Network, wo wir die Trends publizieren und wo wir Diskussionen entfachen, weil natürlich haben wir unsere Experten, aber wir wollen auch unsere Community fragen, eine Art Crowd Sourcing betreiben. Was denkt die über diesen Trend? Welches Potential steckt dahinter? Das ist halt wo wir die Zukunft sehen.”*

²⁴Translated by the author. Original quote: *“IT-Tools müssen im Unternehmen auch mit Prozessen verankert sein um richtig gut zu funktionieren. Deswegen streben wir eine Kombination aus IT-Tools mit geeigneten Prozessen an.”*

First, corporate foresight had to consider new and innovative information sources such as social media platforms, start-ups events and fairs as well as ‘follow the money’ approaches. Nevertheless, the corporate foresight activities were still relying on the personal network and scouts as key information sources for the start-up context.

Second, the start-up focused foresight activities needed new methodologies such as the start-up radar. The focus of the methods was mainly on the core business of the participating companies but was also extended to adjacent business areas. The communication of the corporate foresight results internally into the company as well as externally with suppliers or partners was highlighted as crucial success factor.

Third, the success of corporate foresight in the start-up context relied on the participating people. An open mindset, curiosity and networking skills were pointed out as important characteristics for foresighters.

Fourth, management attention as well as formal diffusion and a company-wide accessibility of foresight insights were highlighted as important organizational aspects of the start-up focused corporate foresight activities. Furthermore a corporate culture with entrepreneurial orientation that embraced new ideas as well as failures facilitated the right environment for successful corporate foresight outcomes.

Fifth, the corporate foresight outcomes were synthesized into reports, presentations as well as visualizations, blog entries and databases. The participating corporations used these outcomes for the development of new products or services, the exploration of new business areas or new business models and the support of the own R&D units with market knowledge. The foresight insights were further communicated externally through marketing efforts, publications or conferences. Also partnerships, collaborations as well as investments in start-ups were based on corporate foresight results. In addition, start-up accelerators or incubators were build up based on corporate foresight insights.

Lastly, the integration of social media platforms as information sources and collaboration medium into the corporate foresight processes as well as a further automatization and support of foresight activities with ICT-tools were identified as emerging trends in the start-up focused corporate foresight area.

CHAPTER 5

Discussion

The goal of the present research was to investigate how companies integrate start-ups into their corporate foresight activities. The responses from the interviewed practitioners revealed valuable insights about start-up focused foresight practices and allowed to examine as well as to compare different approaches of the participating companies. This cross-company analysis made it possible to refine the previously developed conceptual model and to discover six challenges for the integration of start-ups into the corporate foresight practices, which will be discussed in the following. However, as the start-up context has not yet been addressed by the corporate foresight literature, I will relate the results of this research to previous findings in the area of corporate foresight and highlight thereby new discoveries as well as contradictions. According to Eisenhardt (1989, p. 533), the evaluation with findings from previous research allows to increase the generalizability as well as the validity of the research.

5.1 Revised Conceptual Model

The conceptual model of corporate foresight in the start-up context, which was developed in section 2.6, was used as a guiding framework for the preceding empirical part of this study. However, the insights gained from the interviews with foresight experts allowed a further refinement of the conceptual model. As a result, several elements of the model were updated and challenges for the integration of start-ups into the corporate foresight process were identified. Figure 5.1 illustrates the revised conceptual model, whereby the numbers in brackets refer to the corresponding

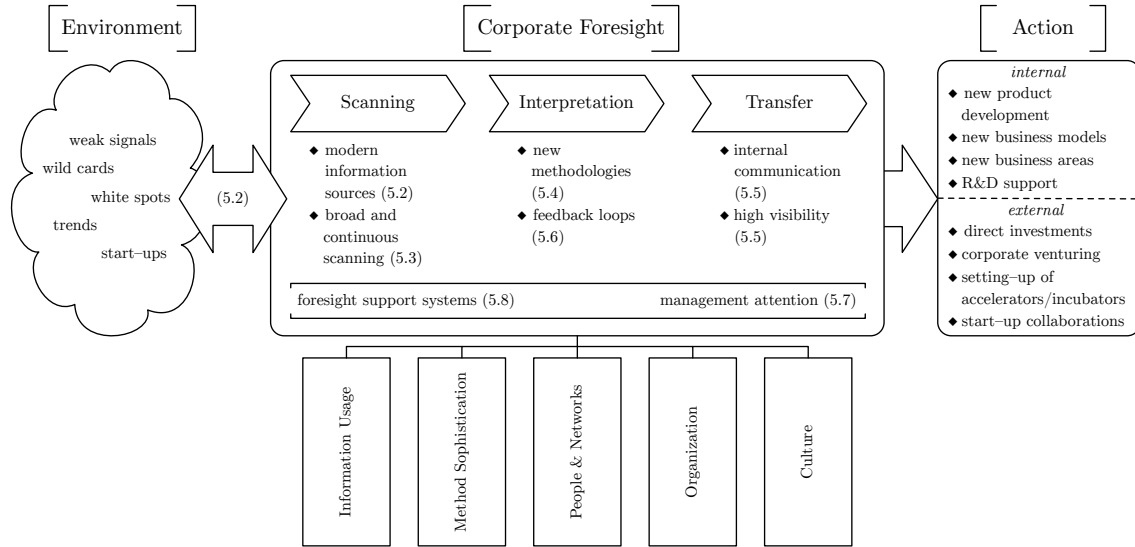


Figure 5.1: Revised conceptual model of corporate foresight in the start-up context

sections that describe the modifications and challenges in detail. The most prominent modifications of the conceptual model are the bidirectional linkage between the environment and the corporate foresight process as well as the corporate foresight actions. The former refers to the active engagement of corporate foresight with the start-up environment in order to get an overarching overview of start-ups in the business environment, whereas the latter refers to the two types of managerial actions triggered by the corporate foresight results as described in section 4.8. The overarching roles of foresight support systems and high management attention are indicated with a bar spanning over all three elements of the corporate foresight process. The following sections will describe the modifications to the conceptual model as well as the challenges when integrating start-ups into the corporate foresight process in more detail.

5.2 Modern Information Sources

The usage of modern information sources was identified as first key finding from the expert interviews. In order to identify disruptions arising from start-ups, the traditional information sources such as scientific articles, news or other publications are not appropriate anymore. Start-ups are releasing information through different information channels than traditional companies. The most prominent new information sources are social media platforms due to the fact that especially in early stages start-ups seek interaction with users, purchasers and partners in order to get

feedback on all parts of the business model (Blank, 2013, p. 67). What we see today, is that many start-ups are very active on social media platforms from the beginning on and use them for feedback gathering activities, also called ‘customer development’ by Blank (2013). As a result, social media platforms qualify as valuable data input channels for start-up focused corporate foresight activities. One advantage of social media platforms as data sources is the richness of the provided data. Foresighters can draw on the crowd’s opinion of a start-up, track the diffusion of the respective idea as well as follow discussions on the business idea. First scientific approaches of integrating social media platform into corporate foresight are already published, for instance see Fiegenbaum and Mohout (2015) as well as Kayser and Bierwisch (2015), and have now be put in practice. Individual practitioners used social media in their corporate foresight activities, but the vast majority has not integrated or even considered them as foresight data sources.

Start-ups should be considered as sources of future-oriented information, but sources that use modern information channels. Corporate foresight, in turn, has to extend its information sources and adapt its information gathering processes accordingly as well as actively engage with the start-up community. Modern information sources includes the ‘follow the money’ approach as explained in section 4.3. By tracking investments in start-ups, companies can get a first glimpse at emerging technologies, uprising business areas or potential competitors. Increasing investments of institutional investors as well as VCs in a certain business area (e.g. FinTech), can be weak signals for potential disruptions in that areas. In addition to social media platforms and ‘follow the money’ approaches, start-up focused corporate foresight activities should also integrate the start-up community as information source. Thereby it became apparent that the foresighting company had to actively engage with the community, indicated with the bidirectional linkage between the environment and the corporate foresight process in Figure 5.1. By organizing start-up contests, fairs or hackathons the company is able to source new ideas, to get an overarching overview of start-ups in a business area and to get insights about possible future developments. Participating companies that organized already such start-up events were very enthusiastic and reported valuable insights as well as network establishment as benefits from these events.

5.3 Broad and Continuous Scanning

Corporate foresight in the start-up context needs wide and broad environmental scanning activities in order to cover all areas of possible disruptions. The focus of the scanning activities should be set not only to the core businesses but include also adjacent business areas in order to detect potential disruptions also in distant business fields. This approach is also what Rohrbeck and Gemünden (2008) define as a good practice. However, the awareness for possible white space areas was low in the participating companies. According to Reger (2001), white spaces can be described as innovation fields with new technologies, customers, products or services that are radically new to the company. These innovation fields could be big opportunities for the companies to grow and to explore new business fields in the long-term, but are accompanied with high uncertainties (Reger, 2001, p. 540). The start-up focused scanning activities should also include these areas as disruptions from start-ups to the current business could also arise from white space areas. Furthermore due to the phenomena of industry amalgamation, whereby competitors from distant business areas are entering the companies' core business, corporate foresight has to intensively scan distant areas as well.

The most prominent search domains of environmental scanning activities (cf. Jain, 1984) in the start-up context were the social as well as the technological sphere among the participants, whereas a special focus was set thereby on the consumer and competitor environment. However, the participating companies had a strong emphasis on trends and the impact of trends on customers and markets. According to Daheim and Uerz (2008), this approach can be assigned to the wave of 'trend-based foresight'. Focusing on trends in corporate foresight has the advantage of resulting in a high level of communication and tangibility of results. Companies might focus the efforts on how best to scan and monitor trends and thereby ignore possible disruptions from other areas. Furthermore this approach limits corporate foresight to a reactive perspective whereby a company is projected as merely being driven by trends or its environment in general (Daheim and Uerz, 2008, p. 331). As a result, start-up focused corporate foresight activities should not only rely on trends, but should instead open up to a more boundary-spanning approach and consider political and economic spheres as well. For instance, Daft et al. (1988) showed that top-performing companies scan the environment more broadly in response to strategic uncertainty than their low-performing counterparts.

As disruptions do not occur in a timely pattern, a continuous environmental scanning is very important. The scanning frequency was identified also by the literature as an important success factor for corporate foresight. According to Daft et al. (1988) as well as Day and Schoemaker (2005), especially in the rapidly changing start-up environment, where uncertainty can be considered as high, it is of great importance to scan more frequently than in stable and low-uncertainty environments. However, many of the participants organized their foresight activities around the quarters of the fiscal year. By reducing corporate foresight activities to episodic interventions, it is flawed and consigned to only a narrow function in a planning perspective (Sarpong et al., 2013, p. 33). As a consequence, the start-up focused corporate foresight has to apply a continuous environmental scanning and therefore be viewed as a bundle of everyday organizing practices, as proposed by Sarpong et al. (2013, p. 39).

5.4 New Methodologies

The start-up context needs a development of new foresight methodologies. Traditional techniques such as scenario analysis or Delphi studies are still applicable, but the specific characteristics of the start-up context have to be recognized with modern and more appropriate foresight methods. Among the interview participants the most prominent new methodology for corporate foresight activities in the start-up context was the start-up radar, as described and illustrated in section 4.4. Start-up radars can be considered as advancements of the technology radar concept, which was initially developed for an identification and evaluation of emerging technologies. By interchanging the observation object from technologies to start-ups and the dimension of the technology development stage to the start-up maturity stage, the participating companies adapted concept of the technology radar to the start-up context. Moreover, some companies extended the radar concept also to trends in order to systematically identify and evaluate trends in their business area.

The start-up radar sets up a systematic foresight process and supports decision-making. The start-up radar allows companies to perform a systematic scan of the start-up environment and thereby to identify start-ups that will impact the business of the established company as well as start-ups that represent future business opportunities. As a consequence, the start-up radar creates a systematized process and an easy-to-grasp visualization to communicate the foresight results with the top-management. Therefore the start-up radar can be considered as an

effective decision-support tool as it provides an overview of the relative maturity and relevance of start-ups in a certain domain. In addition, it impedes personality-driven investment decisions, whereby an influential employee champions a start-up that may not be the best investment for the company. The start-up radar is also able to demonstrate how the proposed start-up stands in comparison with higher-benefit as well as more-mature alternatives and take thereby the role of comparison-tool (Golovatchev et al., 2010, p. 234).

The start-up radar as a foresight tool influences the employee's ways of thinking and fosters communication. Boe-Lillegraven and Monterde (2014) showed, that the radar process requires analytical information processing as well as fosters the exchange of world views and results thereby in a more frequent update of mental models. While the analytic probing is helped by specific criteria for reporting and discussing information, the design of the radar process enables interaction and communication across departments and functions, and is able to motivate people across different units (Boe-Lillegraven and Monterde, 2014, p. 20). The importance of the communication of corporate foresight results will be highlighted in the next section.

5.5 Internal Communication and Visibility

The insights gained through corporate foresight ideally kick-off managerial actions such as new product developments or start-up venturing. Thereby the participants pointed out to the communication of the corporate foresight results as a critical success factor. By sharing insights gained from the foresight activities, companies can create awareness of future environments and potential sources of disruptions, and thereby foster a holistic future-oriented thinking of key employees. The internal communication of results facilitates sharing of foresight stories and knowledge, and stimulates conversations within the company and beyond its boundaries on strategy adjustments and innovations among multiple stakeholders. For instance, Peter and Jarratt (2014) as well as Hammoud and Nash (2014) highlight the importance of an ongoing internal communication about the foresight activities and thereby describe nature of the praxis as "*foresight-as-communication*" (Peter and Jarratt, 2014, p. 9). As a result, it can be said that foresight communication creates awareness of future environments as well as of potential disruptive sources and triggers strategic actions accordingly.

One participating company did not only use the communication of foresight results to increase the awareness of employees about relevant start-ups and upcoming trends, but used it also to create awareness among the employees for the corporate foresight activities itself. A first step to establish such a high visibility of the corporate foresight unit and its activities is to foster a company-wide diffusion and accessibility of foresight insights. First, this allows the company to engage employees as key foresighters and to tap thereby the knowledge of the crowd as data sources for the start-up focused corporate foresight activities. For instance, Miles (2010, p. 1590) describes foresight as *“tool for collective mobilization that can potentially affect all actors in the organization”*. Rohrbeck et al. (2009) highlights that by assigning all employees within a company to scanning activities and supporting its corporate foresight through incentive schemes, the information input of companies can be increased. This approach is related to ‘open foresight’, whereby multiple internal as well as external stakeholders are integrated into the corporate foresight process, as proposed by Daheim and Uerz (2008, p. 332). Second, a high visibility and formal communication of corporate foresight results foster a re-use of the gained information for other purposes. The foresight insights were further used for the strategy formulation as well as for project and start-up assessments by the participating experts. However, the communication interaction within and across organizational boundaries has to be supported by a culture of involvement, commitment and creativity, according to Peter and Jarratt (2014, p. 10). In addition, the participants pointed out to the importance of a present ‘sharing culture’ as a success factor for the comprehensive dissemination of the corporate foresight results in the start-up context.

5.6 Feedback Loops

The review and assessment of corporate foresight outcomes were emphasized as a critical success factor by the practitioners. In order to allow a further re-use of the foresight results as decision support in other company units, the foresight outcomes had to exhibit a high quality and strategic relevance to the company. Many participating companies had therefore strongly controlled quality-gate processes in place. The research from Daheim and Uerz (2008) identified the ‘quality of results’ and the ‘strategic relevance’ as the top two critical success factors for corporate foresight. As the authors pointed out, the methods and the quality of the data are regarded as being of secondary importance. What is critical for the success and

impact of corporate foresight activities is that outcomes are highly relevant to current strategic issues and of high quality (Daheim and Uerz, 2008, pp. 328–329).

Next to the quality of the foresight results also the foresight processes are subject to feedback controls. By continuous reviews and feedback gathering about the foresight processes the company can steadily improve the quality and impact of its foresight practices. For instance, one participating company constantly sought the feedback from the scientific community in order to improve its foresight practices. Furthermore an internal review system allowed also employees to suggest improvements of the corporate foresight activities. In the context of start-ups, a constant adjustment of the foresight practices is important due to the high rates of change and market dynamics. The corporate foresight activities have to adapt accordingly and have therefore to be constantly reviewed and improved.

5.7 Management Attention

According to the participating experts, start-up focused corporate activities needed high management attention. Thereby top-management commitment was rated as an important success factor. Especially in the case of start-ups, which were partly a totally new phenomena to the companies and collided therefore with the organizational structures and corporate mentalities. Furthermore corporate foresight itself was new to many companies and needed therefore an involvement of the top-management as well. Also Hammoud and Nash (2014, p. 16) point out that due to the unfamiliarity of corporate foresight in many corporations, the participation of upper management as well as the need to validate the outcomes for the broader corporate culture are crucial success factors for corporate foresight projects. Corporate foresight should therefore be recognized, funded and supported by the top-management in order to allow an effective operationalization of the foresight activities, according to Peter and Jarratt (2014, p. 9).

Corporate foresight activities can be triggered bottom-up, for instance by employees within the business units, or top-down by top-management or executives. The bottom-up initiation of corporate foresight activities has the advantage of being more closely linked to the present customer demands and thereby being more market-oriented. However, top-management support gives corporate foresight projects a higher perceived relevance and enhances their visibility within the company as well

as facilitates the implementation of their results (Rohrbeck et al., 2009, p. 21). In order to profit from the benefits of both approaches for initiating corporate foresight activities, Rohrbeck and Gemünden (2008) suggest a combination of top-down and bottom-up approaches. In the present research corporate foresight activities were most frequently initiated by the top-management and thereby confirming Daft and Weick (1984), Jain (1984), and Abebe et al. (2010) findings. Nevertheless, a bottom-up process in which employees can bring emerging issues to the upper management attention should also be fostered, as highlighted by one participant.

5.8 Foresight Support Systems

The practitioners confirmed the increasing importance of foresight support systems for the future development of corporate foresight. Furthermore they emphasized ICT-based applications as important enablers of corporate foresight capabilities in the start-up context. This is in line with the findings from Keller and von der Gracht (2014), which show that ICT will be a driving force in the future development of foresight, both for process efficiency and effectiveness. The design of future foresight support systems is crucial since it is driven by several aspects such as communication and collaboration, accessibility, efficiency, and quantitative data handling (Keller and von der Gracht, 2014, p. 90; von der Gracht et al., 2015, p. 4). During the interviews it became apparent that only few of the participating companies were actually using computer-based systems aimed at supporting corporate foresight. The foresight support systems that were used, focused only on the collaboration and communication aspect. For instance, one participating company developed an own collaboration platform, where trends and start-ups could be entered and subsequently assessed by the foresighters. Also von der Gracht et al. (2015) identify that current solutions in foresight are mostly focused on the communication and collaboration level. However, the authors stress that these levels need to be surpassed. Therefore corporate foresight requires flexible, open and powerful foresight methodologies and technologies that support collective intelligence systems. In this sense, merging developments from semantic web, artificial intelligence, text and data mining, ontologies, the psychology of decision making, simulation, pattern recognition and decision support technologies are crucial for the further development of foresight support systems (von der Gracht et al., 2015, p. 4).

Due to the small amount of companies that were actually using computer-based

foresight systems, an assessment of the foresight support systems' impact on corporate foresight practices was not feasible. Nevertheless, first scientific findings from Raford (2015) indicate an increased volume and speed for data collection and analysis, an increased transparency, an increased participation in terms of both amount and diversity, as well as a decreased overall cost of project administration as the main benefits of foresight support systems. Furthermore foresight support system change the current practices of corporate foresight and are able to move foresight toward a real-time practice, based on constantly updated images and developments of the future (Raford, 2015, p. 65).

However, corporate foresight is likely to remain a very people-oriented process. As pointed out by one participant, only the combination of ICT-based tool with established processes and foresighters was considered as the approach of further development in the area of corporate foresight. Especially strategic decision making will, at most, only be supported by ICT tools and will still rely on the peoples' capabilities, as emphasized by Keller and von der Gracht (2014, p. 90). In conclusion it can be said, that foresight support systems will be play an increasingly role in the corporate foresight activities and change the current practices. However, successful corporate foresight will be still relying on its foresighters and therefore a feasible combination of processes together with ICT-based supporting tools should be strived for.

CHAPTER 6

Conclusion

Corporate foresight enables the company to detect discontinuous change early, to interpret the consequences for the company, and to formulate effective responses with the aim of ensuring the long-term survival and success of the company (Rohrbeck, 2010, p. 12). In the present research a focus was set on incumbent firms exposed to external discontinuities arising from start-ups. However, previous research has not addressed yet the corporate foresight practices in the start-up context. Therefore the goal of the research was to investigate start-up focused corporate foresight activities and thereby to answer the following research question:

How do established companies across different industries integrate start-ups into their corporate foresight activities?

In order to identify relevant disruptive start-ups early on and anticipate with strategic responses, corporate foresight activities had to be extended to the start-up context. Nevertheless, an integration of start-ups into the corporate foresight processes needed adaptations to the current corporate foresight elements and practices in order to tribute to the specific characteristics of start-ups. By drawing on explorative interviews with foresight experts across different industries, insights into how start-ups can be effectively integrated into corporate foresight were provided. The findings indicate that start-ups were integrated into corporate foresight in order to source new ideas, to identify upcoming trends, to recruit high-potentials as well as a way to perform market-testings. By doing so, corporate foresight practices needed new information sources as well as updated versions or even new methods such as start-up radars and innovation maps. Furthermore it became apparent that companies had to actively engage with start-ups and the community by organizing hackathons, fairs or contests

in order to identify relevant start-ups in their business area. The insight gained from the corporate foresight activities triggered new kinds of managerial actions: start-up collaborations were established, start-ups were integrated into business units, strategic start-up investments were undertaken, accelerators were opened as well as start-ups were ‘acqui-hired’ based on corporate foresight results.

As a result, start-up focused foresight could be considered as an extension of the current corporate foresight practices, but adaptations were needed. Thereupon six challenges for the integration process were identified. Corporate foresight had to extend its information sources to more modern and start-up suitable data sources that enabled a broad and continuous environmental scanning including distant and adjacent business areas as well as possible white spots. Subsequent to the information gathering process, feedback loops were identified as critical success factors for the data processing and knowledge building. These quality control mechanisms ensured a high quality and a high relevance of foresight outcomes to current strategic issues. A company-wide communication of corporate foresight results stimulated conversations within the company and fostered thereby a future-oriented thinking of employees. An overarching top-management attention and commitment was identified as an important success factor, especially in the case of start-ups, which collided with organizational structures and corporate mentalities due to their speed, agility and out-of-the-box thinking. In addition the supporting role of a ‘foresight culture’, characterized by commitment, sharing and creativity, was critical for the success and impact of the corporate foresight. Furthermore foresight support systems were pointed out to as important enablers of foresight capabilities in the start-up context that will increasingly gain importance for the development of future corporate foresight practices.

6.1 Theoretical Contributions

The research field of corporate foresight emerged only after 2000 and can therefore be considered as a young but fast growing research area (Rohrbeck, 2012, p. 208). The present research is enriching the knowledge base of corporate foresight by providing insights from its application in the start-up context. The literature review examined corporate foresight by taking different perspectives, namely the strategic management, innovation management and futures research perspective. Consequently, several value contributions of corporate foresight were highlighted and trends in its application

identified. Thereby foresight support systems were identified as important drivers for the development of future corporate foresight practices. In addition, the literature review revealed a wide range of definitions of start-ups and pointed out to several value contributions of start-up collaborations.

Through cross-industry interviews with foresight experts it was able to extend Rohrbeck's (2010) maturity model to the new context of start-ups. Thereby findings from Hammoud and Nash (2014), Peter and Jarratt (2014), Rohrbeck et al. (2009) and Daheim and Uerz (2008) could be transferred to the start-ups context. In addition, context-specific characteristics of the five maturity model dimensions were recognized and six challenges for the integration process were identified.

6.2 Managerial Implications

From a practitioner's point of view, the present research is a basis for managers who would like to understand how to integrate start-ups into their 'corporate foresight engines' in order to give attention to the market and possible disruptions of tomorrow. Moreover, it gives actionability by providing insights into established start-up focused foresight activities alongside the dimensions of information usage, method sophistication, people and networks, organization, and culture. The findings indicate that there are several challenges for the integration of start-ups but there are also opportunities to benefit from this approach. The following framework may serve as a guideline for successfully integrating start-ups into the corporate foresight activities (see Figure 6.1). The integration process is divided into four stages and highlights for each stage the steps needed in order to extend corporate foresight to the start-up context.

Forming. Build additional sensors to identify disruptive start-ups. Use a mixture of modern information sources and an active engagement with the start-up community. Integrate foresight support systems into the corporate foresight practices and combine thereby people-oriented processes with computer-based foresight applications. Companies need to continuously explore and develop new business fields in order to counterbalance when their current business fields start to become unprofitable as well as to ensure a long-term competitiveness. Thereby companies need to develop specific abilities that allow them to identify new promising business fields and the ability to develop them. For this reason firms are increasingly looking toward corporate

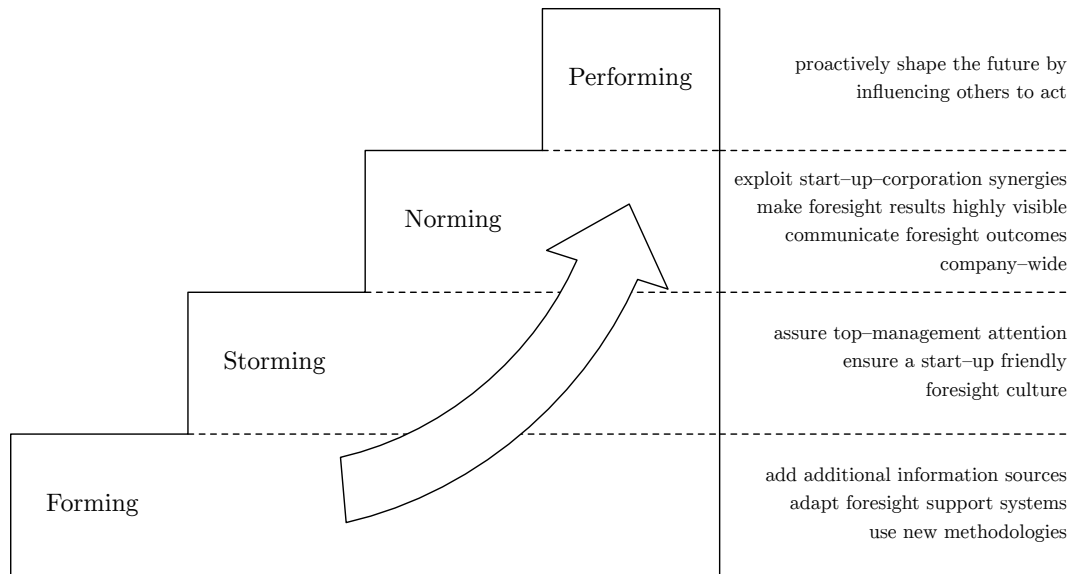


Figure 6.1: Four stages when integrating start-ups into corporate foresight.
Naming inspired by Tuckman and Jensen (1977, p. 420)

foresight for a systematic exploration of new business fields. By integrating start-ups into the corporate foresight activities, companies can not only get early insights into new trends but also discover emerging business fields that are currently served by start-ups but could be of great value for established companies.

Storming. Ensure a high level of top-management attention in order to trigger appropriate strategic responses on the basis of the foresight results. Support start-up focused corporate foresight with an innovation and start-up friendly culture. Particularly the speed, agility and out-of-the-box thinking of start-ups can cause collisions with the predominant organizational structures and corporate mindsets. Therefore it is important that start-up focused corporate foresight activities are underpinned by an entrepreneurial culture of commitment and creativity and supported with an wide-ranging people-centric network.

Norming. Ensure a high visibility of the corporate foresight activities and establish a company-wide communication of the gained insights. Exploit synergies between start-ups and the corporation in order to drive innovation. Thereby it is crucial to access complementary assets and to unlock an extensive knowledge-transfer between start-ups and established companies. Start-ups are recognized as more appropriate engines of disruptive as well as radical innovations and can therefore exploited as sources of innovative ideas as well as upstream suppliers of technology. Established companies in turn, have the resources to scale the business model up

and to intensively expand sales and distribution. As a results, cooperations between creative, young start-ups and mature incumbents should be sought for and harnessed more extensively.

Preforming. Use corporate foresight as a mechanism to proactively shape the future by influencing other stakeholders to act. Start-up focused corporate foresight activities are an opportunity to look long-term at the market environment and to actively engage with the future. Thereby corporate foresight is able to shape the future by influencing other actors, for example, by helping to develop new markets. In contrast, the other approach is to act reactive and thereby let the environment take control and shape the company. Hammoud and Nash describe the two possible approaches as follows: “*Shape the future or let the future shape you*” (Hammoud and Nash, 2014, p. 18). Passively reacting is not always the best choice, but start-up focused corporate foresight gives practitioners the opportunity to pursue their common vision and to actively shape their future.

6.3 Limitations and Future Research

The findings of this research study extended the knowledge about the corporate foresight in the start-up context. The present work thus offers interesting opportunities for scholars who aim at deepening the understanding of the linkages between corporate foresight and start-ups and their role in shaping the responses of organizations to environmental changes. Due to the small and unrepresentative number of participants the research lacks generalizability. Industry differences cannot be analyzed since the study did not control for the industry type. In addition, the focus of this study was on start-ups. Therefore, the conclusions cannot be applied easily to other subjects in the corporate foresight process.

A further limitation of the research is that it built exclusively on evidence from foresight units. In consequence, the present study is subject to an informant bias by which the reported impacts could be overstated. More research exploring the integration of start-ups into corporate foresight from other views in more companies and different industries is certainly of interest, to test whether the outcome of this study would be different if more and different kind of practitioners had participated. At least more participating foresight managers as well as internal customers will better validate and strengthen the qualitative results to ascertain a persistent conclusion.

In addition, there is a need for theoretical work including the development of propositions and a consistent framework that examine the benefits and impact of corporate foresight in the start-up context. However, due to a lack of a common framework and measurement, even in the the broader strategic foresight literature, the impact of foresight on the company's innovation performance has not been fully addressed yet. The present research suggests that it will be important to develop more rigorous empirical measurements to capture the outcomes of the foresight activities. Therefore further quantitative research in the field of corporate foresight is needed in order to investigate the contributions of corporate foresight to innovation performance and ultimately to firm performance.

The findings of the present research suggest that start-up focused corporate foresight activities can be considered as an extension of current corporate foresight practices. Further research is needed in order to determine the degree to which it is feasible and valuable to integrate start-ups into corporate foresight activities. Additional knowledge and insights are required in order to understand the theoretical underpinnings of the the delicate trade-off decision.

A further limitation arises from the application of the Gioia methodology for data analysis alongside with the usage of a predefined interview guideline. As the guideline was organized around the five dimensions of Rohrbeck's corporate foresight maturity model, the participants' answers and subsequently the data structure was biased toward the predefined themes and categories from the interview guideline. As a result, the emerging codes and themes were closely linked to the dimensions of the maturity model and hindered therefore novel phenomena to arise from the conversations and subsequently from the coding process. Future research should incorporate these learnings and apply a merely open coding process with a subsequent unbiased axial coding step.

A key limitation of the present study is the cross-sectional design of the research. Although this approach allowed to interview foresight experts across different industries, it did not allow to investigate dynamic developments over time. Studying companies at several points in time would allow to determine the influence of corporate foresight on the firm's ability to survive disruptions as well as radical changes. Future research should apply a longitudinal research design in order to control for these dynamic changes over times.

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Appendices

Interview Guideline

A.1 Start-Ups

- Wieso sind Start-ups für Sie von Bedeutung?
- Inwiefern sind Start-ups für Ihr Unternehmen von Relevanz?
- Welche Funktion haben Start-ups für Ihr Unternehmen?
- Welchen Wert sehen Sie in Start-ups?
- Welche Vorteile haben Start-ups?
- In welcher Phase sind Start-ups für Sie interessant?

A.2 Information Usage

- Welche Informationsquellen verwenden Sie für Start-ups?
- Was sind Ihre wichtigsten Informationsquellen?
- Welche Rolle spielt das persönliche Netzwerk dabei?
- Greifen Sie auf exklusive Datenquellen zurück?

A.3 Method Sophistication

- Welche Methoden verwenden Sie für Start-up Corporate Foresight?
- Wie identifizieren Sie Bereiche, in denen sie verstärkt nach Start-ups suchen?

- Gehen sie da zum Beispiel von ihrem Kerngeschäft aus?
- Könnten Sie den Prozess erklären wie sie Corporate Foresight machen?

A.4 People and Networks

- Welche speziellen Eigenschaften müssen Foresighter im Start-up Kontext besitzen?
- Welche Rolle spielt das Firmen-Netzwerk dabei?
- Tauschen Sie sich mit anderen Unternehmen zu dieser Thematik aus?

A.5 Organization

- Können Sie anhand eines Beispiels skizzieren, wie Corporate Foresight in Ihrem Unternehmen abläuft?
- Wie ist Corporate Foresight bei Ihnen im Unternehmen strukturell organisiert?
- Wie groß ist das Team?

A.6 Culture

- Inwieweit spielt die Firmenkultur dabei eine Rolle?

A.7 Trends in Corporate Foresight

- Wo sehen sie die Trends in dem Bereich?
- Wie bewerten sie die Integration von IT-Tools in Corporate Foresight?
- Wie stellen Sie sich Corporate Foresight in 5 Jahren vor?

A.8 Critical Incident Question

- Können Sie ein Beispiel aus der Vergangenheit erwähnen, wie Sie mit einem Start-up kooperiert oder zusammengearbeitet haben?
- Können Sie anhand eines Beispiels aus der Vergangenheit erklären, wie Sie die Corporate Foresight Resultate im Unternehmen weiter verwendet haben?

APPENDIX B

Interview Codes

The following pages contain the final coding table. The interview transcriptions and the MAXQDA coding file can be requested from the author.

| Themes Codes | Market Environment | Role of Start-ups | Information Usage | Method Sophistication | People & Networks | Organization | Culture | Foresight Outcomes | Trends |
|-----------------|-------------------------------|-----------------------------------|---|-------------------------------|----------------------|--|--|--|-------------------------------------|
| 1 | High VC activity | Start-ups as technology sources | Network as information source | Innovation map | Networking skills | Management attention | Sharing culture | Reports | Social media as information sources |
| 2 | Industry amalgamation | Start-ups as recruiting tools | Competitors as information source | Start-up radar | Open for new ideas | Freedom to operate | Flexibility | Presentations | Social media as collaborative tools |
| 3 | New business fields/platforms | Start-ups as trendsetters | Exclusive data sources | Trend radar | Open-minded | Top-down approach | Entrepreneurial orientation | Visualizations | Automatization of foresight |
| 4 | New business models | Start-ups as idea sources | Hackathons | Corporate blog | Creativity | Integration with other processes | Partnering for innovation | Blog entries | ICT-based foresight tools |
| 5 | Shorter innovation cycles | Start-ups as market-testing tools | Start-up fairs | Employee suggestion system | Idea generation | Formal diffusion of insights | Open for new ideas | Internal databases | Increasing start-up integration |
| 6 | Risk-aversion in Germany | Start-ups as competitors | Start-up contests | Newsletter | Interdisciplinarity | Company-wide accessibility of insights | Embracing failures | Trend profiles | |
| 7 | Low entry barriers | | Crowd-funding as information source | Core business screening | Internationality | Bottom-up approach | New ideas must be well thought through | Recommendations to the management | |
| 8 | Dynamic market environment | | Follow the money | Technology oriented screening | Proactive | Quarterly foresight | Many new ideas, but must hold water | Start-up assessments | |
| 9 | | | News as information source | Ad-hoc screening | Curious | Process-oriented foresight | | Impact analyses | |
| 10 | | | Scientific papers as information source | Use case based screening | | Unsystematic foresight | | Communication of foresight results | |
| 11 | | | Trend reports as information source | Trend oriented screening | | Networked foresight | | Development of new products or services | |
| 12 | | | Blogs as information source | Strategy oriented screening | | Review and assessment | | Adjustment of current products or services | |

| | | | | |
|----|--|------------------------------|------------------------------|---|
| 13 | Scouts as information source | Focus on mature start-ups | Feedback loops | Exploration of new business areas |
| 14 | Open innovation as information source | Rigorous start-up assessment | Expert round table | Introduction of new business models |
| 15 | External agencies as information source | Continuous screening | Visibility of foresight unit | Support of R&D with market knowledge |
| 16 | Accelerators as information source | Patent based screening | | Conferences |
| 17 | VCs as information source | Cross-national screening | | Publications |
| 18 | Community stakeholders as information source | Scenario technique | | Marketing efforts |
| 19 | Thought leaders as information sources | | | Partnering with start-ups |
| 20 | | | | Direct investments in start-ups |
| 21 | | | | Open up accelerators/incubators for start-ups |
| 22 | | | | Integration into business units |
| 23 | | | | Knowledge & technology transfer |
| 24 | | | | Close cooperation |
| 25 | | | | R&D collaboration |