Corporate Foresight: An Emerging Field with a Rich Tradition
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Corporate Foresight: An Emerging Field with a Rich Tradition

Introductory Paper for

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By

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Abstract

The goal of this introductory article to the Special Issue on Corporate Foresight is to provide an overview of the state of the art, major challenges and to identify development trajectories. We define corporate foresight as a practice that permits an organization to lay the foundation for a future competitive advantage. Historically we distinguish and discuss four main phases 1) birth of the field (1950s), 2) the age of scenarios (1960s-1970s), 3) professionalization (1980s-1990s), and 4) organizational integration (2000-). A systematic literature search revealed 102 articles on foresight, 29 of them on corporate foresight. Based on these articles and those in this Special Issue, we identify four main themes. Two more mature themes, namely 'organizing corporate foresight', and 'individual and collective cognition', and two emerging themes 'corporate foresight in networked organizations', and 'quantifying value contributions'. In the conclusion we make a plea for establishing corporate foresight as a separate research stream that can adopt various theoretical foundations from a number of general management research traditions. To help the field move forward we identify three areas in which corporate foresight research can build on theoretical notions in general management, and can contribute to such on-going debates.

Highlights

- Defining corporate foresight as an integrative organizational practice
- Four phases in the historical development of corporate foresight
- Current studies: organizing, cognition, network organizations, and value assessment
- Corporate foresight as a separate research stream
- Connections with and contributions to general management areas

Keywords: corporate foresight, strategic foresight, review, historical development

1   Introduction

Growing uncertainty leads to a growing need to understand the dynamics leading to uncertainty. Corporate foresight aims to enable managers to understand and act upon future environmental uncertainty. Two main reasons for this Special Issue project are i) to clarify terminology and provide a platform to catalyse the academic debate within the corporate foresight research stream, and ii) to ensure that this debate is sufficiently connected to and embedded within general management research.

We believe that this is particularly needed in the light of a rapid growth of both practitioner and academic interest [1]. A search for "strategic foresight" and "corporate foresight" in Thomson's Web of Science leads to 102 articles for the time period between 2005 and 2014. A decade earlier (1995-2004) only eight articles were published and another decade earlier (1984-1994) only one single article.

This rapid growth has also resulted in some key challenges for the future development of the research stream, including:

- *Ambiguous terminologies*. As is often the case in nascent research fields, various terms are used synonymously while different terms refer to similar or overlapping concepts. In particular the terms 'strategic foresight', 'corporate foresight' and 'futures research' have been used insufficiently differentiated from each other.

- *Academic field weakly organized*. There is not yet a scientific body that consolidates the academic debate even though there are dedicated journals, most notably Technological Forecasting and Social Change (with 25 articles in the last decade), Futures (16), Technology Analysis & Strategic Management (4) and the practitioner journal Futurist (6). There are however already dedicated tracks at academic conferences (such as ISPIM[1], PICMET[2], and BAM[3]) that can drive the consolidation of the field.

- *Weak linkage to debates in general management journals*. In the last decade, only three articles on corporate foresight have been published in general management journals: European Management Journal (1), MIT Sloan Management Journal (1), and Scandinavian Management Journal (1). In addition, another three articles

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[1] ISPIM: International Society for Professional Innovation Management, http://ispim.org/groups-communities/forsight-future
[2] PICMET: Portland International Conference for Management of Engineering and Technology, http://picmet.org
[3] BAM: British Academy of Management, https://www.bam.ac.uk/bam2012-track-summary

have been published in innovation management journals: R&D Management (1), Research-Technology Management (1), and Creativity and Innovation Management (1). This suggests that the emerging field of corporate foresight has been developed more or less in isolation from general management debates, which is, we believe, an undesirable situation.

We regard the establishment of a link to the general management literature mostly as a re-connection, due to the traditional links with *environmental scanning* [2, 3], *strategic issues management* [4-6], *sensemaking and sensegiving* [7-9], and *(forward-looking) organizational search* [10-12]. More recent corporate foresight articles, however, show a decreasing tendency to utilize the theoretical basis created by scholars in these four preceding research streams. This, we believe, is a lost opportunity, preventing corporate foresight scholars from tapping a rich source of theoretical understanding and for general management scholars a lost opportunity to utilize recent empirical findings from corporate foresight research, in particular the micro foundations of organizational adaptation and change.

We return to the possible cross-fertilization of corporate foresight and general management research in the conclusion of this article. First, we define corporate foresight as a concept. We provide an historical account of the evolution of the field, we explain the two dominant conceptualizations of corporate foresight (as a routine tied to decision-making and as an integrated organizational practice), and we discuss current corporate foresight research and identify the main research trajectories. We conclude with an outlook and recommendations for the future development of the field.

2   Defining Corporate Foresight

The concept of foresight is built on the assumptions that 1) multiple futures are possible (i.e. that future developments are uncertain and unpredictable), 2) change (drivers) can be identified and studied, and 3) the future can be influenced [13]. In this section, we briefly discuss a selection of definitions of foresight in organizations, to identify core elements of corporate foresight. The first definition is from Ahuja, Coff, and Lee who emphasize the role of the individual and take a resource-based view. They argue that managers need to perform foresight to acquire resources at below their future value in order to create a competitive advantage [14]. Consequently, they define foresight as an individual ability, without specifying how this is achieved:

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"Managerial foresight is the ability to predict how managers' actions can create a competitive advantage" [14]

In that context the model from Daft and Weick, that proposes that organizations can be conceptualized as interpretation systems, is often referenced to as the first article that emphasized the role of a process to develop foresight. In their conceptual article from 1984, they proposed that organizations need to build interpretation systems that translate data from scanning the environment into managerial action [8]. In line with this theoretical concept, Hamel and Prahalad proposed in their Harvard Business Review article [15] that:

"Industry foresight is based on deep insights into trends in technology, demographics, regulations, and lifestyles, which can be harnessed to rewrite industry rules and create new competitive space."

Others focus more on the foresight process and follow-up activities. For example, Becker [16] emphasizes the integration of the foresight process with decision-making and proposes that:

"Foresight should be understood as a participatory, future intelligence gathering and medium-to-long-term vision-building process that systematically attempts to look into the future of science, the economy and society in order to support present-day decision-making and to mobilise joint forces to realise them"

While this definition has been widely used, it builds on a linear process-logic that today only few consider being a good representation of what actually occurs in organizations. Firms embracing foresight usually do not treat it as just a project or a process with a clear start and finish. In such firms, foresight is an on-going series of efforts that informs management about possible future states and what is needed to realize these. In line with this, Slaugther [17] has introduced the conceptualization of foresight as an organizational *ability*:

"Strategic Foresight is the ability to create and maintain a high-quality, coherent and functional forward view and to use the insights arising in organisationally useful ways; for example: to detect adverse conditions, guide policy, shape strategy and to explore new markets, products and services."

Slaugther's definition emphasizes the need to depart from assuming linearity in translating future insights into managerial actions, and introduces a set of desirable outcomes to which foresight should contribute.

Surprisingly, later definitions agreed with the conceptualization as an ability to emphasize more the data collection and analyses aspects, rather than the value creation. For example, Tsoukas and Shepherd wrote:

> *"Foresight marks the ability to see through the apparent confusion, to spot developments before they become trends, to see patterns before they fully emerge, and to grasp the relevant features of social currents that are likely to shape the direction of future events." [18]*

and

> *"Organizational Foresight is [...] the organizational ability to read the environment – to observe, to perceive – to spot subtle differences" [19].*

In both quotes the ends to which organizational foresight should contribute are not specified. This could be deliberate as corporate foresight can potentially contribute to many areas, ranging from risk management, corporate development, and innovation management, to strategic management [20, 21]. Thus, it makes sense that authors refer to the common denominator that corporate foresight contributes to organizational decision-making.

In *our definition* we emphasize the importance to tie the perception and interpretation to the value creation. We propose that:

> *Corporate foresight permits an organization to lay the foundation for future competitive advantage. Corporate Foresight is identifying, observing and interpreting factors that induce change, determining possible organization-specific implications, and triggering appropriate organizational responses. Corporate foresight involves multiple stakeholders and creates value through providing access to critical resources ahead of competition, preparing the organization for change, and permitting the organization to steer proactively towards a desired future.*

3   Historical Background

3.1   1950s: Birth of the field

Corporate foresight emerged as a research stream in the 1950s. The new field had two main roots. The first was the French 'prospective' school, founded by the philosopher and high-level public servant Gaston Berger [13]. The second was the 'foresight' school, based in the work of Herman Kahn at the RAND Corporation in the US. He developed and pioneered

many methods that are still central to contemporary corporate foresight approaches, the most prominent being the Delphi technique.

There were, however, even earlier seeds planted, for example by the British-born philosopher and Nobel laureate Alfred North Whitehead [22]. Whitehead introduced the term 'foresight' in his 1933 book 'Adventures of Ideas' and hinted in his highly acclaimed lecture at Harvard University in 1931, that the business mind of the future would need to acquire philosophical competencies to understand the complexity of societies. This very early observation is still a core element of corporate foresight. In particular, the idea that firms need to build capabilities to engage in collaborative systems thinking, in order to make sense of the past and the present, and to anticipate the future. In that respect, we can conceptualize systems thinking as observing and analyzing various factors that influence a system collectively.

Systems thinking was also a central element in the work of Gaston Berger. Berger, founding father of the French prospective school, added many methods that enable groups of decision-makers to explore and shape the future [13]. Berger's conceptualization of foresight emphasizes that organizational issues and decision-making are often characterized by a high inherent complexity. He translated this into the requirement that foresight methods need to permit to involve the (sometimes many) actors who, in later stages, will contribute to organizational decision-making and the implementation of these decisions. His methods enable collaborative thinking, future-oriented sensemaking, and facilitate collaborative decision-making. Berger emphasized the need to include the decision-makers into this collaborative thinking, as he believed that failing to include them in the process, will result in the failure to trigger meaningful decisions, let alone engage in meaningful collective actions.

Berger's work was motivated by three observations, namely that the world is accelerating, that man is capable of irreversible acts, and that most (political) debates focus around the means and lack a clear understanding and consensus about the desired ends. In particular, the third observation hints at the potential of foresight methods—for example, scenarios—to provide visions about a desirable future. Discussing desirable future states is a feature that provides both public and corporate foresight exercises with the power to motivate for change and focus planning attention on a desirable goal [13]. For that purpose, Berger also founded a club of CEOs of the largest French enterprises. This club started piloting and subsequently applying his methods in political and corporate decision-making arenas. Many

of his methods take the form of workshop-based systems-thinking approaches that allow facilitating collaborative reflection and decision-making.

The importance of involving decision-makers was less pronounced in the works of Hermann Kahn. The RAND corporation acted more like an external think tank, collecting and consolidating expert opinions. For this, Kahn pioneered methods such as the Delphi technique. The Delphi technique has proven powerful in consolidating expert opinions in an informed way. It ensures that not the average or the most vocal experts prevail, but provides participants the opportunity to reason about the opinions, the arguments, and the backgrounds of the other participants through multiple rounds of discussions.

These two main roots, the French 'prospective' school and the US 'strategic foresight' school, have inspired other national approaches such as the Italian school, which takes a sociological stance. This tradition, called "social forecasting", started in 1968 with the foundation of the Club of Rome, involving important Italian sociologists, such as Aurelio Peccei and Eleonora Barbieri Masini. "Social forecasting" assumes that it is primarily human action that shapes the prospective future. Foresight studies therefore need to pay attention to the human side, i.e. imagination, rather than relying mainly on systematic and quantitative methodologies. This means that foresight should have specific characteristics: 1) being global [23] with a multi-disciplinary view [24] and consider that things constantly change [25]; 2) investigating topics strictly connected to humans (e.g., ethics, environment, and demography) and 3) deriving both explorative and normative results [26].

3.2   1960s and 1970s: The age of scenarios

In the 1960s the field of corporate foresight sees a variety of successful applications of its methodological and processual repertoire. The debate centred on methods as the key element of useful corporate foresight. The most extensively discussed example is the scenario program of Royal Dutch/Shell. This program started with the realization that the linear economic-planning (forecasting) tools were no longer sufficient for planning in an increasingly complex and turbulent world. In 1968, the head of Shell's Unified Planning Machinery system, announced that the planning system [27]:

> "…was faulty in that it looked at one certain view of the future, and changes would have to be made to take account of uncertainty and alternative futures"

This marked a turning point for corporate planning, resulting in the initiation of the Shell scenario program. One early application was the scenario-based oil-price report that was sent to the board in 1971 [28, 29]. It portraits a sharp increase in oil prices, which was based on the insight that oil exporting nations might not indefinitely be prepared to increase production to meet growing demand. This report described in many aspects the oil crisis that was later triggered by the Yom Kippur War and the Arab Oil embargo [27]. However, Shell's scenario planning program was not designed to predict the future, but to create a set of plausible scenarios that permit to create a platform for a dialogue about the future and helping

"breaking the habit, ingrained in most corporate planning, of assuming that
the future will look much like the present" [28].

Inspired by Shell's success, other companies, such as Motorola, General Electric and United Parcel Service, followed suite and installed scenario-planning approaches, often as an addition to their (forecasting-based) business and corporate planning systems [30-32]. After two decades of scenario planning, the method can be considered as mainstream [33]. This is a consequence of an increasing awareness that management under uncertainty needs more than the traditional tools and techniques [34, 35]. Although the methodological toolbox of corporate foresight has greatly evolved since the 1960s and 1970s, scenario planning can still be considered as the most prominent and one of the most powerful techniques. Three major reasons are its strong systems thinking basis, its ability to create powerful and shared pictures of possible, plausible and desirable futures [36-40], and its ability to serve as an integrating platform for other foresight techniques such as trend analysis, cross-impact analysis and planning methods such as road mapping.

3.3   1980s and 1990s: Professionalization of methods and processes

In the 1960s and 70s, industries were often rather stable and controlled by companies that had attained a dominant position either by technological leadership or by a dominant sales and distribution network. Corporate foresight at that time focussed primarily on supporting long-range planning and was thus often implemented as a linear forecasting approach. In the 1980s, this status quo was increasingly challenged [41-43].

Globalization and oversupply in many industries increased competitive rivalry substantially. Innovation and, in the broader sense, organizational learning became the imperative to attain and maintain a competitive advantage and corporate foresight approaches

were extended to support not only strategic decision-making but also innovation management [44, 45].

This resulted in the emergence of new methods. Methods such as (technology) roadmapping made their appearance, first in large technology-driven companies, but were later also used by a large variety of companies [46-49]. Companies such as Daimler, BASF, Deutsche Bank, Telecom Italia and BMW started to build think tanks that were commissioned to inform strategic planning and/or drive prospective innovations. These think tanks had teams of 30 people and more, and in some cases a sizable budget for probing into new business fields [16, 35, 50-52].

More importantly however, corporate foresight systems faced the demand to create continuous scanning and interpretation approaches [53, 54]. Until then, corporate foresight—in the strategy context—was typically carried out in the form of large projects that were repeated regularly, but typically only with large intervals of multiple years. Corporate foresight for innovation however was increasingly performed to inform about technology and market trends on an on-going basis. This resulted in the implementation of continuous corporate foresight processes that translate signals about future markets and technology changes into research and development projects, decisions to invest in other companies, and important strategic issues that are followed up by other processes and units [55-58].
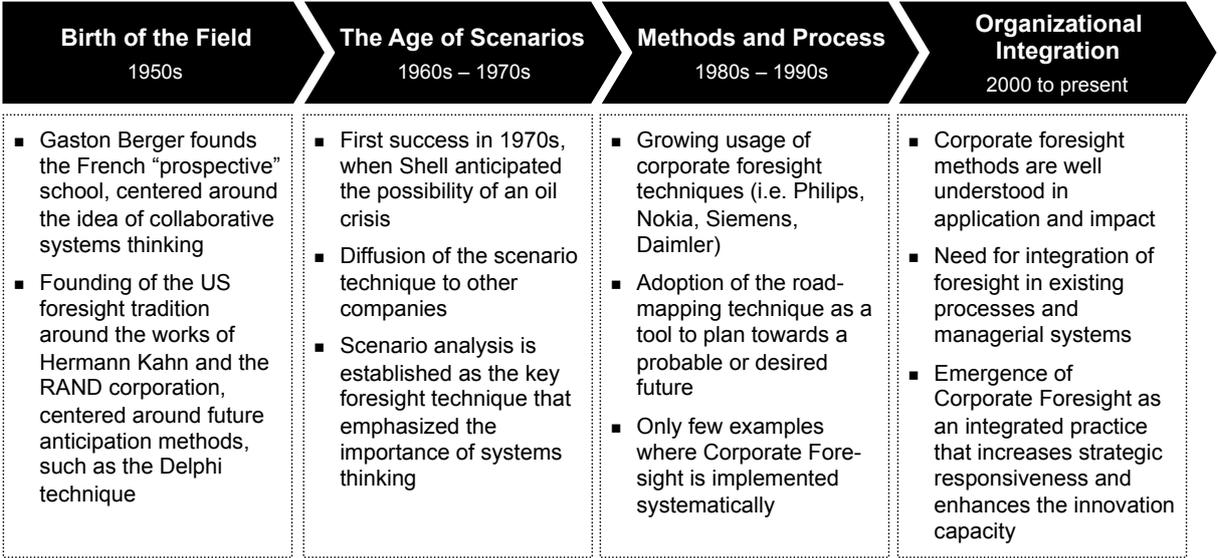
Birth of the Field 1950s	The Age of Scenarios 1960s – 1970s	Methods and Process 1980s – 1990s	Organizational Integration 2000 to present
■ Gaston Berger founds the French "prospective" school, centered around the idea of collaborative systems thinking ■ Founding of the US foresight tradition around the works of Hermann Kahn and the RAND corporation, centered around future anticipation methods, such as the Delphi technique	■ First success in 1970s, when Shell anticipated the possibility of an oil crisis ■ Diffusion of the scenario technique to other companies ■ Scenario analysis is established as the key foresight technique that emphasized the importance of systems thinking	■ Growing usage of corporate foresight techniques (i.e. Philips, Nokia, Siemens, Daimler) ■ Adoption of the road-mapping technique as a tool to plan towards a probable or desired future ■ Only few examples where Corporate Fore-sight is implemented systematically	■ Corporate foresight methods are well understood in application and impact ■ Need for integration of foresight in existing processes and managerial systems ■ Emergence of Corporate Foresight as an integrated practice that increases strategic responsiveness and enhances the innovation capacity

Figure 1: Development of the Corporate Foresight research stream

3.4   2000 and beyond: Organizational integration

The implementation of corporate foresight processes has in many firms led to the creation of organizational routines that facilitate the development of future insights. However, many firms still report challenges in translating these insights into organizational responses [59]. The fundamental dilemma seems to be twofold: on the one hand, a large variety of data sources have to be tapped into and the resulting collections of quantitative and qualitative data require human interpretation by ideally top managers to be effective. On the other hand, the limited time and attention span of top management prohibits sufficient exposure to the raw data.

Firms tackle this dilemma in different ways, though each way has substantial downsides:

1. *Firms outsource the initial data filtering* to internal or external analysts. This pre-filtering can be dangerous, as important signals are easily overlooked by analysts who lack a sufficiently high vantage point to anticipate implications.

2. Firms use *IT tools for performing initial data analyses*. These tools use pre-defined algorithms to cluster and/or pre-process signals and translate them into issues. As these algorithms are time-intensive to develop, they are often standardized and thus not industry-, domain- or firm-specific enough to create value. In addition, they are also available to competitors of the focal firm, thereby reducing their competitive relevance.

3. Firms *outsource the entire data analysis* to management or strategy consultants, who perform the analyses and provide board-level decision-making documents to define and vote on organizational responses. This leaves top management the role of voting on pre-defined alternatives. This prevents top management from exercising the entrepreneurial/creative role of imaging and developing unique and competitively effective organizational responses.

In recent years, corporate foresight research and practice have focussed increasingly on ways to integrate processes in order to create an integrated corporate foresight practice. Such an integrated practice would leverage distributed organizational sensing, interpretation and planning capabilities. Corporate foresight contributes through an orchestration role as well as by filling the gaps left by existing functions, such as research & development, innovation management, strategic management, risk management, and corporate development.

Through case studies, a maturity model, aimed to conceptualize the organizational ability, has been developed [59]. It distinguishes five dimensions focussing on:

1. Information usage: how does a firm sense and absorb data?

2. Method sophistication: how are methods used to interpret data?

3. People & networks: how is data translated through informal means into actionable insights?

4. Organization: how is data translated through formal mechanisms such as processes into actionable insights?

5. Culture: How do aspects of organizational culture promote or prevent the translation from data into actionable insights?

This model is a useful starting point to conceptualize and empirically investigate the role of corporate foresight in improving firm performance. In recent years, the model has been further developed into a set of measurement scales and applied in survey-based theory-testing research. For example, Paliokaitè and Pacesa in this journal issue [60] find a positive influence of corporate foresight on the level of ambidexterity of firms. Another example is Jissink et al. [61], who find a positive influence of corporate foresight on innovation performance.

4   Current Corporate Foresight Research

In addition to academic contributions, a number of influential practitioner books have brought corporate foresight to the attention of a wider audience. A well-known example is "Competing for the Future" from Gary Hamel and Coimbatore K. Prahalad, which has been cited over 10,000 times (according to Google Scholar) [62]. It is regularly referenced to emphasize the importance of building capabilities to proactively shape the future of an industry and secure a favourable position in it.

Three recent and more academically oriented discussion forums have contributed significantly to the development of the field:

*   2002: The 'International Conference on Probing the Future: Developing Organizational Foresight in the Knowledge Economy' organized by Haridimos Tsoukas and Jill Shepherd at the University of Strathclyde. The outcomes were captured in a book [18], in a Special Issue of Futures [19] and summarized in a book review by Karl E. Weick [38]. The conference developed the idea that foresight can be regarded as an organizational skill.

- 2003: The Conference of George Day and Paul Schoemaker on 'Peripheral Vision' at the Wharton School, which resulted in a Special Issue in Long Range Planning [63]. The conference emphasized the need to scan for weak signals not in the current business but in adjacent businesses and white spaces far away from current business operations. Influential strategic management scholars such as Sidney Winter have emphasized the need to build special purpose sensors to identify discontinuous change [64].
- 2010: The Special Issue on 'Strategic Foresight' in Technological Forecasting and Social Change in which the ambiguity in terminology was addressed, clarifying in particular that the term 'strategic foresight' and the French 'prospective' are synonymous and encompass "both the process and the results of the process in terms of action" [65].

The current Special Issue follows in this tradition. By using the term "corporate foresight" we aim to emphasize our focus on the application of strategic foresight in organizations. In addition, we aim to establish corporate foresight as the label of one of the two research streams in strategic foresight, the other one being research dealing with the macro-economic perspective, focusing on exercises and processes that inform national policy making. While both research streams share elements such as methods and generic processes, the current debate on the integrated organizational practice is only valuable for the research stream on strategic foresight in organizations, i.e. corporate foresight. Consequently we hope that by advocating the label 'corporate foresight' we help to channel and catalyze the debate further.

What is current state of the art? When analyzing the 102 articles identified in Web of Science over the past ten years, we can distinguish the following groups:

a) Corporate foresight (strategic foresight in organizations): 29 articles
b) Strategic foresight for policy making (often dealing with informing the science, technology and innovation policies): 31 articles
c) General articles (dealing with methods or processes that can be applied in both domains): 22 articles

The remaining 20 articles are conference articles that were either earlier versions of journal publications or had no relevance for both research streams. The breakdown shows that

the two research streams have acquired a comparable level of interest in the past 10 years. However, research activities on corporate foresight show the highest growth in the most recent years.

In the following we focus on the corporate foresight debate and analyze the main themes of both the 29 articles from the literature analysis and the 12 articles in our special issue.

4.1 Organizing corporate foresight

The largest group of papers investigates *how* corporate foresight is organized, aiming to derive normative recommendations on how it should be organized to generate specific outputs and/or maximize value creation. This set of papers contains a number of mostly descriptive case studies, including Siemens in Turkey, where an action research project is described [66]; PepsiCo using methods such as scenarios, extrapolation and weak signal scanning to influence the company's strategic research agenda [67]; POSCO (a Korean steel maker) case study suggesting that strategic foresight can also be developed and exercised by individual leaders [68]; Bayer MaterialScience and the usage of scenario-based visioning for innovation [69], two corporate foresight projects in aviation and asset management describing and advocating the role of wild cards [70]; Iberdrola (an energy utility) case study which describes how strategic foresight mechanisms can also have negative effects by becoming a source of strategic rigidity [71]; four comparative-cases studies that explore different organizational characteristics of corporate foresight and linking them to organizational outcomes [72-75]; and one article describing a specific (consultancy) approach adapted to SMEs [76].

Other case studies are more geared towards theory building. For example, the case study of Daimler that documents how corporate foresight has contributed to exploring future markets and customers, to evaluating innovation ideas, and to inducing organizational change [50]. One multiple-case study finds evidence that human-based scouting might be the preferred mechanism to create strategic foresight in fast moving industries [77]. Another multiple-case study in the telecommunication industry defines effectiveness and efficiency of corporate foresight and highlights the role of specialization, internal cohesion mechanisms and formalization of procedures to become more foresightful [78]. Another multiple-case study in the software industry highlights the role of individual and group-level prospective sense-making to create strategic foresight [79]. Other results include four generic success criteria derived from cross-industry cases [20], three roles that corporate foresight can play for

advancing the innovation capacity of an organization [80], and the interaction of different modes of organizing innovation and strategic foresight [81].

In this special issue, Darkow [82] contributes a case study in a chemical company. She proposes a five-phase foresight-based strategy development approach. The focus is on the integration of middle management in activities such as strategic intelligence and strategic option development, emphasizing that participation in foresight approaches should include more actors than just the top management.

The paper of Vecchiato [83] links conceptually corporate foresight to strategic agility. The author introduces a conceptual model that links environmental changes to long-term performance. As intermediate constructs he proposes, environmental uncertainty, sources of first mover advantage, organizational "memories of the future", and learning and adaptive skills (i.e. strategic agility).

The paper of Ruff [84] permits us to revisit the case of Daimler's Society and the Technology Research Group, which can look back at 30 years of history. The case was for the first time introduced to the academic debate in 2006 [50]. New roles and approaches are being shared and discussed. By using other examples for reflection, Ruff proposes two key success criteria. First, being complementary to existing functions such as corporate, marking, or product strategy. The complementarity can be on content and/or time horizon, by focussing for example mostly on the long term. Second, being able to demonstrate the added value, which implies the importance to ensure a "deep embedding" of foresight experts in the value creation processes, such as new product development. He thus re-emphasizes the proposition of Berger to involve the users' foresight in the process and extends it to involving the foresighters in the follow-on processes. In addition, Ruff identifies five fields of foresight practices. These are: early detection in new business environment; trend research for the generation of product innovation; prospective evaluation of innovation ideas; exploration and development of new business; and cross-functional dissemination of future-related issues.

4.2 Individual and collective cognition for corporate foresight

In the second largest group of papers, the focus is on individual and group practices that enhance strategic foresight. This thread of academic discussion has its roots in the environmental scanning literature [2, 85] and the literature on managerial cognition [86-88]. The role of proactive environmental scanning for competitive advantage has been widely

recognized [5, 6, 89]. In that respect, however, it is surprising and discouraging that Day and Schoemaker in 2008 still reported that only 23% of CEOs scan for weak signals in the periphery. The others tend to focus rather on operational excellence [90].

In more recent years, academic discussions have moved from the sensing phase to the sense-making phase of corporate foresight. Authors conceptualize corporate foresight as an ability to alter individual or group cognition in particular through organizational practices. For example, Sarpong and Maclean propose strategic foresight as being built by every-day reflective practices (prospective sense-making and multilateral participation) and strategic conversations (application of future methodologies and cooperation and practice judgement) [91].

The paper in this special issue of Peter and Jarratt [92] shows how such practices unfold in communities of practice. Empirically, they are using a comparative case study design of two companies linked by common ownership. Their results indicate that strategic foresight can be built through continuous collection and synthesis of strong and weak signals and their translation into scenarios. They conclude that long-term planning can be conceptualized as an "ongoing interrogation of implemented and envisioned strategies within emerging, alternative futures". They propose a conceptual framework that illustrates how strategic foresight can be integrated in long-term planning.

The paper of Boe-Lillegraven and Monterde [93] investigates the role of environmental scanning systems for triggering organizational learning. They conceptualize strategic foresight as an ability of managerial cognition and organizational learning. More specifically, they investigate how strategic foresight approaches contribute to altering mind-sets, stimulating "hypothetical thinking" and helping organizations in becoming more proactive and attentive to future issues. The empirical reflection basis is a case study on Cisco's Technology Radar. The paper shows the success of the tool, emphasizing its ability to induce analytical thinking and to involve and connect people around future topics.

The paper of Hofmann [94] conceptualizes the "trend receivers" as individuals who help organizations in making complex and long-term decisions by perceiving and interpreting changes and potentials of emerging changes. The paper is based on the analysis of different trend receiver studies at Audi. The paper offers guidance and illustrations with cases how to identify and leverage the ability of such trend receivers.

The paper of Hines and Gold [95] also looks at foresight on an individual level. They investigate the role of "organisational futurists", conceptualized as individuals who act as

brokers and internal strategic foresight champions in organizations. Such organizational futurists address three challenges of strategic foresight (episodic use, cultural resistance, and lack of integration and usage). The empirical basis for the paper is the experience of one of the authors, who has worked in this role for many years in different organizations.

The paper of Scheiner *et al*. [96] picks up the old concept of the technological gatekeeper [97] and investigates the role of thinking patterns, intuition and gut feelings in technology identification and evaluation. Based on interviews with 50 Research and Development executives, they find a strong influence of tenure on thinking patterns and on the ability to exercise gut feeling. They also find that, paradoxically, the value of using intuition is perceived as high, when applied by the individual gatekeeper, but as inappropriate at the organizational level.

The paper of Rhisiart *et al.* [98] aims to uncover if and to what extent organizational learning is conditional to learning at the individual level. They use an application case of a specific scenario-based workshop format to explore the micro processes used to create organizational learning. They measure the learning outcomes along multiple dimensions and conclude that pedagogically rich scenario processes can induce individual learning and challenge existing mental models. These in turn promote the organizational sensing capability, associated with the dynamic-capabilities model from Teece *et al.* [99, 100], and are able to induce organizational learning.

The final paper in this section of our special issue, Burt *et al.* [101] provide a note of caution, that over-emphasising foresight activities by top management is also carrying the risk of "managerial hyperopia". It is the condition of being able to focus clearly on what is far away, but not on the near-field managerial issues. They utilize empirical evidence from a single, longitudinal case study to suggest that when engaging heavily in foresight activities in turbulent environments, a counterbalance is needed to ensure that organizational performance in the short term is not jeopardized.

4.3   Corporate foresight in networked organizations

The third category of papers is labelled "Networked Organizations". It can be considered an emerging issue, and contains only four papers. We decided to feature it as a category in its own right because we expect that the interest in this area of investigation will grow rapidly. First, due to a growing political interest in addressing societal grand challenges, such as

climate change or renewable energy through public-private partnerships that operate as quasi-firms, with business plans and CEOs [102, 103]. Second, because of the increasing interest to develop highly complex innovations requiring multiple firms/actors to collaborate, such as electric mobility, where car companies, energy utilities and road/petrol station providers need to act in an orchestrated fashion to develop effective innovations.

For cases that require radical change of behaviour and/or substantial investments of multiple actors, it is imperative that a joint visioning, planning and execution program is established. Michel Godet and Philippe Durance advocated the need to enact the Greek triangle consisting of Logos (thought, rationality, discourse), Epithumia (desire in all its noble and not-so-noble aspects), and Ergo (action or realization) to drive innovation and change [104]. Foresight methods and approaches can be vital in this quest, in particular when it comes to sustainability innovations [105].

It has been advocated that strategic foresight can boost and facilitate collaborative exploration of new business fields [106] and business planning [107]. Also, in other public-private domains such as the planning of armament as documented in Wiegand *et al.*, strategic foresight approaches have been found to enhance and facilitate planning [108].

In our special issue, the paper of Heger and Boman [109] contributes to this academic debate by describing and discussing the strategic foresight system of the European Institute of Innovation and Technology. Based on an in-depth case study and a survey among member organizations of the networked organization, they find that value creation through strategic foresight occurs in particular through building a shared vision. This in turn facilitates organizational learning and enables reconfiguration capabilities.

4.4 Quantitative evidence of value contributions

Our fourth category of literature, Quantifying Value Contributions, is equally emergent as compared to the third and we also expect it to grow faster than the first two. The reason is that research on corporate foresight shows strong signs of maturing. Terminologies are being increasingly harmonized, dedicated conferences and special tracks at conferences are consolidating the academic debate and first papers that introduce components for theory testing are appearing. Jissink *et al.* (2014) propose a theoretical model to measure the impact of antecedents, such as strategic orientation on corporate foresight and the impact of corporate foresight on innovation performance [110]. A working paper suggests that the impact of corporate foresight is significant on both innovation and firm performance [61].

In our special issue, Paliokaitè and Pacesa [60] have contributed with a theory testing paper that also proposes a survey instrument to measure corporate foresight. The authors conceptualize corporate foresight as a seizing and reconfiguration ability. The results indicate a positive relationship between corporate foresight and organizational ambidexterity. The authors find that foresight contributes to not only explorative but also exploitative innovation.

5   Conclusion

Our main objective for editing this Special Issue and writing this introductory article was to clarify terminology and to provide a platform to catalyze the academic debate within the corporate foresight research stream. We believe that this is necessary, feasible and timely.

The shared past of research on strategic foresight for policy making and for organizations has been effective in creating a strong platform with an extensive portfolio of methods and processual best-practices [111-113]. The theoretical underpinning has, however, been traditionally weak [114, 115]. This lack of theoretical foundation can only be overcome by treating policy-related and organization-related strategic foresight separately. The good news for corporate foresight, our preferred term for organization-related strategic foresight, is that it can adopt theoretical foundations from a number of general management research traditions. We will discuss these options later in this conclusion.

The reasons why we believe that the timing is right to pursue corporate foresight as a separate research stream are the emergence of its conceptualization as an integrative organizational practice (see section 3.4.), and the rapid growth in interest from practitioners and scholars. The growth in interest can be understood as being rooted in the simultaneous further increase of competitive rivalry and increased environmental uncertainty in many industries. In such environments, firms can either focus on maximising flexibility and responsiveness, or acquire new capabilities to proactively build a future competitive advantage.

Firms choosing the latter option should build dynamic capabilities [100, 116]. Scholars subscribing to this view expect that exercising these dynamic capabilities will permit organizations to renew their portfolio of strategic resources [117]. While we agree with the importance of actively working towards securing a future competitive advantage, we believe that the exclusive focus on novel strategic resources could be diverting the attention away from more powerful competitive mechanisms. In particular, the narrow conceptualization of

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Eisenhardt and Martin (2000) of dynamic capabilities as residing with research & development, strategic decision-making and alliances do not recognize sufficiently the role of perception of early signals of emerging trends, the organizational interpretation capability, and the ability to trigger organizational responses ahead of competition [118].

We thus argue that focussing academic and practitioner discussions around one common term (corporate foresight) can at this moment in time be a necessary and welcome catalyst. It can be a catalyst, which integrates theoretical foundations from general management theory and the latest empirical evidence from strategic-foresight-related research, and boosts knowledge creation about how organizations can strive in our uncertain and hypercompetitive environments.

We see three theoretical launching platforms for such research:

- *Managerial cognition*, which emphasizes the role of the individual and group cognition in shaping perception and influencing decision-making [119]. There is a growing body of knowledge that links participation in corporate foresight exercises to changes in decision-making. For example Chermack reports that scenario-planning exercises can change participants' decision-making styles to become more intuition-based [120] and Bøe-Lillegraven and Monterde, in this Special Issue, report on the impact of foresight radars on multiple cognitive measures. We see this theoretical lens as particularly promising to inform about how to organize foresight exercises and a needed stepping stone to understand the importance of participation in corporate foresight systems.

- *Forward-looking search*, which is based on the behavioural theory of the firm, emphasizes that individuals are bounded-rational, and therefore firm decision-making cannot be conceptualized as purely rational or analytic reasoning [121, 122]. For corporate foresight research, the proposition of Cyert & March, that the search for a suitable (adaptive) managerial response is often excessively local and not sufficiently prospective, is particularly relevant [123]. Gavetti and Levinthal propose that in consequence organizations need to build the ability to exercise a forward-looking search [10]. How organizations build this ability is only poorly understood. More empirical research is needed on how such a search can be executed and how the search results are processed further. We believe that the corporate foresight research tradition has interesting insights to contribute.

- Prospective sensemaking considers organizing as a process in which individuals build on their past experiences, retrospectively and collectively reflect on these episodes, and through sustained interaction build converging cause maps that permit them to converge behind common objectives and lines of action [124]. Gephart, Topal, and Zhang develop the concept of future-oriented sensemaking, which builds on the proposition that similar enacted convergence of multiple individuals can occur on the basis of shared projections (i.e. images of future objects) [125]. That such memories of the future can form the basis for hypothesizing about alternative hypothetical behaviour is also supported from psychology research [126, 127]. While we acknowledge that the theoretical basis of sensemaking is still hampered by a limited understanding of temporality, the prospect for corporate foresight research building on these theoretical foundations is promising [128].

Though the above list of options for theoretical launching platforms for corporate foresight research is by no means exhaustive, it provides corporate foresight scholars with a fruitful set of pursuable avenues. In addition, these options can also serve as a means for converging the currently disconnected scholarly debates, and for boosting the opportunities for cross-fertilization between corporate foresight research and general management research traditions.

We hope that the ideas expressed in this introductory article will contribute to forming a research stream on corporate foresight (i.e. strategic foresight in organizations), raising interest from general management scholars, and realizing further progress in the emerging and fascinating area of corporate foresight.

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