Strategic Foresight Capability and its Impact on Firm Performance: A systematic, AI-based Literature Review

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Abstract

Strategic foresight is a growing field that attracts scholars aiming to reduce the uncertainty of volatile business environments. However, the field must address crucial challenges to advance theory and practice. To achieve this, the thesis presents a systematic, AI-based literature review that structures the foresight field, displays the status quo, and offers research trajectories. A sample of 243 journal-published articles is analyzed to create an organizing framework as well as provide narrative syntheses on foresight capability and its impact on firm performance. This analysis points out that foresight research often lacks theoretical foundations, mixes epistemological dimensions, and does not work toward a shared objective. Still, six research themes and their connections were identified for an organizing framework. Further, the review points out capabilities for successful foresight: Distinct processual and contextual capabilities developed in accordance with a firm's environment can ensure success. Lastly, the paper emphasizes that "successful foresight" manifests in practice through a positive impact on strategic, organizational, and performance outcomes. Those findings support the efforts of establishing foresight in management studies and improving academic progress.

Keywords: Strategic foresight; Firm performance; Foresight capabilities; Literature review; Organizing framework.

1. Introduction

In a global business environment with high uncertainty and disruptive innovations, firms find themselves in a substantially unstable competitive landscape (Tapinos & Pyper, 2018). This requires them to develop capabilities and logics that allow them to succeed despite the faced complexity (Haarhaus & Liening, 2020). This directed the attention of researchers and professionals to the idea of reducing the presently faced uncertainty by understanding possible future scenarios and their consequences (Iden, Methlie, & Christensen, 2017). The concept of "strategic foresight" captures this idea as a practice of using information about the future to systematically learn, improve decision-making, and gain a competitive advantage (Rohrbeck, Battistella, & Huizingh, 2015). Put another way, strategic foresight aims at understanding trends and changes before the competition and capitalizing on this knowledge through superior performance (Yoon, Kim, Vonortas, & Han, 2018). The interest in this idea resulted in a rapidly growing field of management research (Rohrbeck, Thom, & Arnold, 2015).

However, while strategic foresight became a prevalent topic in research (Burt & Nair, 2020), several publications point out issues in the still nascent field (e.g., Piirainen & Gonzalez, 2015). The main concerns are that the field is weakly organized, unstructured, and insufficiently linked to relevant debates in management journals (Rohrbeck, Battistella, & Huizingh, 2015). This hampers theoretical progress and the advancement of foresight practices since the field lacks a clear, combined objective (Hines, 2020; Iden et al., 2017; Snyder, 2019). Further, research to date focused mainly on antecedents and foundations for foresight while findings on necessary capabilities and outcomes are scarce despite their perceived importance (Iden et al., 2017). This paper addresses these issues through a systematic, AI-based literature review that creates orientation in the developing field and bridges the existing gaps to improve future research. In doing so, the paper answers the following three questions: Q1: "What is the current state of strategic foresight research?", Q2: "Which capabilities do firms need for successful strategic foresight?", and Q3: "How does successful strategic foresight reflect itself in overall firm performance?".

These three questions will be answered through a systematic literature review. This review consists of three distinct parts that are interconnected but focus on one individual question each. First, a quantitative overview of strategic foresight research is provided to structure the field, identify gaps and opportunities, and ultimately answer the first research question (Q1). Then, two qualitative reviews are conducted, that focus on the current knowledge on necessary capabilities for successful strategic foresight (Q2) and foresight's impact on firm performance (Q3). In sum, this will advance the foresight field by adding the lacking structure, displaying the status quo on important frontiers, and providing guidance for future research and practice.

The data for this review is gathered primarily by the AI-based search engines Iris.ai and Semantic Scholar and will be cross-checked with the established databases ScienceDirect, JSTOR and Sage Journals to ensure exhaustiveness and to assess the maturity of the AI search engines. For the quantitative component of the review, 243 journal-published articles were compiled and nominally categorized to point out trends and themes in the field. For the two qualitative components, the findings of relevant papers are presented through narrative syntheses that create well-founded bases for further research. First, foresight capability, which research suggests as a mediator for foresight's success and outcomes, is analyzed regarding the capabilities that compose it in different conceptual models/frameworks. Second, the possible impact that successful strategic foresight can have on firm performance is displayed through collected empirical findings. The insights of those three components are contextualized in the final discussion.

Following this introduction (1) the next chapter further defines the concept of strategic foresight and displays the evolution of the research field with its gaps and challenges (2). Then, the research approach and methodology of this paper are explained in detail (3) as a basis for the following chapters. In those chapters, a tripartite systematical literature review is conducted and the findings of each part are presented. First, a quantitative review displays the existing foresight research and creates structure in the field through a comprehensive framework (4.1). Then, the existing findings on strategic foresight capability (4.2) and foresight's impact on firm performance (4.3) are showcased thoroughly in qualitative reviews. The information presented in those three literature review components create the basis to answer the paper's research questions (Q1-3) which will be done in the subsequent discussion (5). To round the paper off, the most important findings, contributions, and limitations of the paper are concluded (6).

2. Theoretical Background

This chapter discusses the concept of strategic foresight as well as its existing research and will function as a foundation and context for the thematical literature review in the main body of the paper. The following sections do not aim to develop a general theoretical model for strategic foresight but rather provide the necessary information to understand the subsequent analyses, frame the discussion, and implicitly point out the academic and practical relevance of the paper.

2.1. Conceptual Definition of Strategic Foresight

Futurism captures the idea of studying the future, learning from it, and integrating the acquired knowledge into present-day decision-making (Burns, 2021). This concept emerged due to the velocity, uncertainty, and complexity of environmental changes of our time which lowered scholars' and professionals' confidence in the effectiveness of decisions based solely on past data (Bennett & Lemoine, 2014; Hobday et al., 2020). Instead, they started to integrate evaluations of trends and environmental discontinuities into their decision-making in an effort to reduce the faced complexity (Rohrbeck & Kum, 2018). One especially prominent and increasingly researched example of such futures studies is "foresight" (Ballandonne, 2020).

Fundamentally, the concept of foresight builds on the assumption that while there are multiple possible futures, drivers of change can be identified, studied, and used to influence the future (Berger, de Bourbon Busset, & Massé, 2007). This epistemologically differentiates foresight from forecasting, which rather tries to predict one, scientifically justifiable future (Martin, 2010). "Strategic" foresight connects this idea to corporate organizations and describes a firm-level process of "identifying, observing, and interpreting factors that induce change, determining possible organization-specific implications, and triggering appropriate organizational responses" (Rohrbeck, Battistella, & Huizingh, 2015). In practice, firms facilitate this with the aim of understanding change before the competition to proactively shape their behavior and achieve better firm performance (Yoon et al., 2018).

2.2. Evolution of the Strategic Foresight Field

Despite some challenges, the study of (strategic) foresight has a long tradition and is constantly growing and evolving (Hines, 2020). Over time, the number of yearly publications steadily increased while the focus of researchers shifted significantly (Gordon, Ramic, Rohrbeck, & Spaniol, 2020). Reviews about the evolution of the field (e.g., Gordon et al., 2020; Hines, 2020; Iden et al., 2017) point out that historical research mostly focused on "methods applied, organizing practices, and experiences gained" (Iden et al., 2017) while current research concentrates on corporate integration, and foresight's impact on competitive and innovation capabilities (Gordon et al., 2020).

In particular, many recent studies focused on how successful foresight can grant a competitive advantage and how that affects firm performance (e.g., Arokodare & Asikhia, 2021; Rohrbeck & Kum, 2018). Others covered the antecedents, challenges, and opportunities of firms trying to implement strategic foresight practices in their organization (e.g., Hamel, Ims, & Yoccoz, 2022; Mastio & Dovey, 2021; Wright, O'Brien, Meadows, Tapinos, & Pyper, 2020). Further,

a new stream of foresight research emerged which focuses on how technology can be leveraged to improve strategic foresight and its outcomes (e.g., Mühlroth & Grottke, 2018; Schoemaker & Tetlock, 2017). However, many researchers argue that the theoretical progress addressing these topics is slow due to the field's weak organization and structure (Hines, 2020; Iden et al., 2017). Therefore, a detailed research overview will be presented in this paper to resolve this issue and refine future research output.

2.3. Academic Challenges in Foresight Research

As indicated, the foresight field faces some crucial challenges due to its developing state (Rohrbeck, Battistella, & Huizingh, 2015). Firstly, there is no single, generally accepted "theory of in within foresight" which results in a missing theoretical basis (Piirainen & Gonzalez, 2015). While several publications addressed this issue by providing coherent conceptual definitions (e.g., van der Laan, 2021; Gordon et al., 2020; Rohrbeck, Battistella, & Huizingh, 2015), many new studies still differ in their theoretical foundation. Secondly, confusion arises from the fact that various terms in the foresight field are used for related, overlapping concepts: Specifically, "strategic foresight", "corporate foresight", "managerial foresight", and "organizational foresight" are often used synonymously while some scholars argue that differentiation is necessary (Rohrbeck, Battistella, & Huizingh, 2015). Thirdly, building on other scholars' findings can be difficult because researchers discuss strategic foresight in different dimensionalities: Some see it as an individual phenomenon, while others describe it on an organizational level (Sarpong, Maclean, & Davies, 2013). Those factors combined cultivate an opaque research field with slow theoretical progress (Rohrbeck, Battistella, & Huizingh, 2015).

The last issue makes it especially difficult to build a shared understanding of foresight due to competing epistemologies (Paliokaitė, Pačėsa, & Sarpong, 2014; Sarpong, Maclean, & Alexander, 2013). While some researchers suggest that organizational and individual foresight processes could be considered as isomorphic (Hines, Gary, Daheim, & van Der Laan, 2017), others emphasize that differentiation is necessary (Rohrbeck, Battistella, & Huizingh, 2015). Also, it is unclear how individual foresight capability translates to an organizational level and how this effects overall firm performance. To prevent this uncertainty, this paper focuses mainly on organization-level foresight as the unit of analysis. However, individual-level foresight is covered in the organizing framework (Ch. 4.1.3) and discussion of foresight capability (Ch. 4.2.2) due to its potential role as a micro-foundation for foresight outcomes.

Also, despite significant contributions to foresight methodology and organization, other frontiers that are highly relevant to advance academia and practice have not sufficiently been tackled (Gordon et al., 2020). In particular, findings on foresight capability and foresight's advantages for firms are still relatively limited despite their practical importance (Gordon et al., 2020; Hines, 2020). Therefore, this paper does not only provide a recent, structured overview of the field but also displays the current knowledge on the two mentioned topics to showcase the theoretical status quo in those areas. Those two objectives combined aim to create a well-founded, state-of-the-art foundation and reference point for future strategic foresight research.

3. Research Approach and Methodology

The following sections explain the scientific approach of this paper and point out how the process of gathering and analyzing data was conducted. Further, the differentiation and interconnection between the quantitative and qualitative components of the literature review are displayed. This aims to build an understanding of the paper's research process as well as to provide transparency on its findings, their scientific basis, and potential limitations. Figure 1 illustrates the overall approach that will be discussed in more detail in the following sections.

3.1. Approach and Source Selection

The scientific approach in this paper is twofold and differs between the quantitative and qualitative sections: First, a quantitative review of foresight literature systematically and statistically displays the existing research to provide structure and orientation in the field. The aim here is to identify and classify existing publications to point out opportunities for future research. This part aims to answer the first research question (Q1) and functions as a foundation for the subsequent qualitative review. There, a systematic literature review focusing on existing research regarding strategic foresight capability and (successful) foresight's impact on firm performance is conducted. This review displays and summarizes the theoretical progress in those subfields to ultimately answer the second and third research question (Q2-3) of this paper.

Regarding source selection, the quantitative review includes a broad spectrum of strategic foresight research and does not set a content-related focus. It covers all English, journal-published, and peer-reviewed articles that the used search engines identify. Other sources like books or conference papers are omitted to minimize quality concerns and keep the sample in a manageable size. This does not entail a significant risk of excluding important scholarly contributions because researchers typically publish their work in academic journals first. The review will focus mainly on papers published in and after the year 2000 because environmental uncertainty and complexity increased significantly during that time which spiked the interest in business-related (strategic) foresight (Gordon et al., 2020). Prior research focused mainly on quantitative forecasting in less volatile environments (Rohrbeck, Battistella, & Huizingh, 2015) and is, therefore, less relevant for this paper (Djuricic & Bootz, 2019). The search keywords are "strategic foresight" as well as its previously introduced related "synonyms" (chapter 2.3) and are intentionally formulated broadly to cover a large spread of academic literature. However, articles that describe
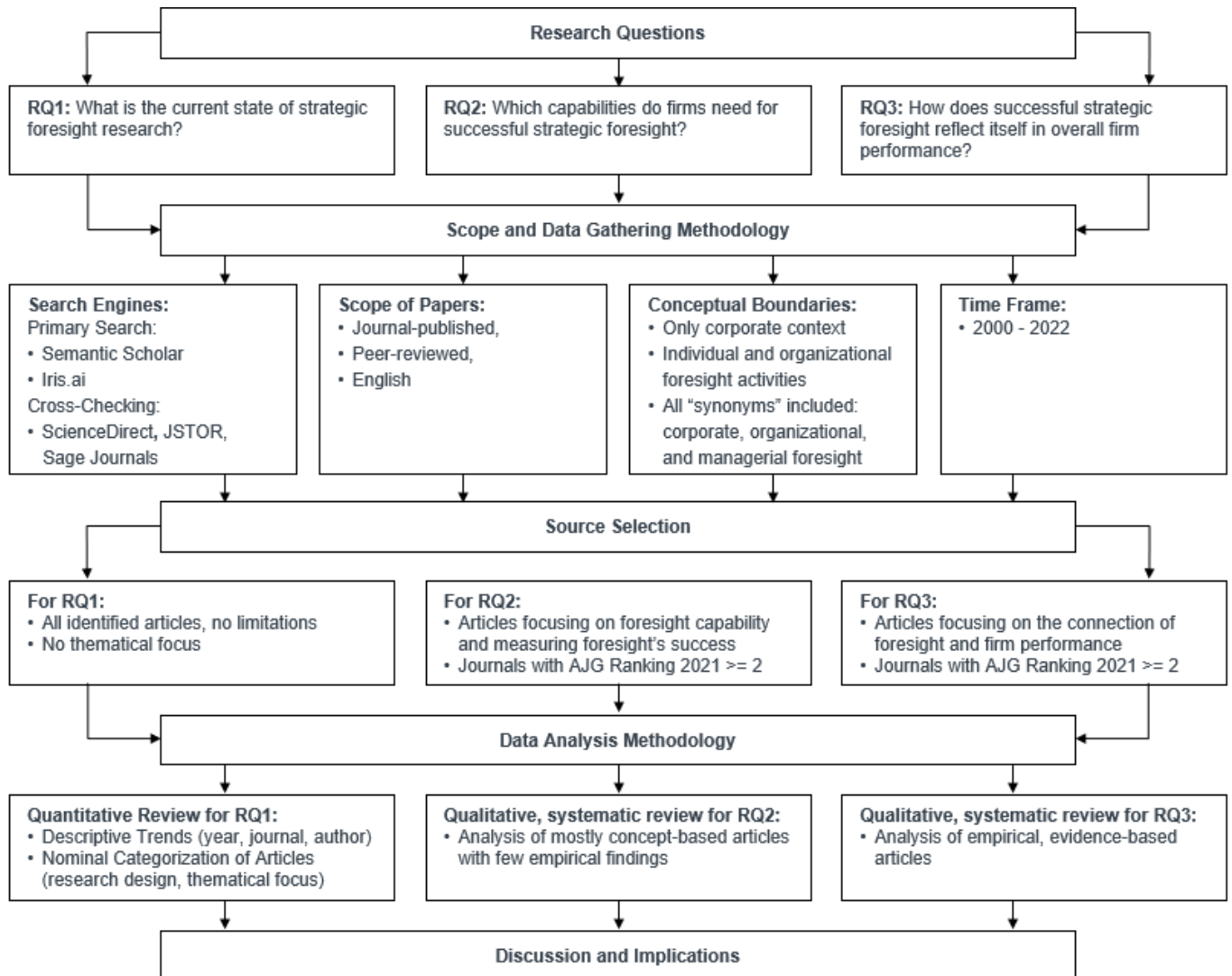
Figure 1: Research Approach (Own Illustration).

foresight that does not occur in corporate organizations (e.g., governmental foresight) will be excluded.

For the qualitative literature review, most criteria for in- and exclusion are the same as in the quantitative part. However, the thematical focus is narrower and only covers the stated topics (capability and firm performance) while unrelated foresight research will be excluded. Additionally, the quality of the analyzed articles is relevant in this part and only well-respected research will be integrated into the final discussion (AJG Ranking 2021: $>= 2$). This differentiates the qualitative literature review from the preceding quantitative review that includes all journal-published articles (regardless of their rating and reputation). In the chapter about foresight capability (Ch. 4.2), an exception is made for two book-published models that conceptualize foresight capability (Miller & Sandford, 2019; Rohrbeck, 2010) since they are frequently referenced but never fully explained in reputable journals. This is necessary due to a lack of specific, evidence-based findings on strategic foresight capability (e.g., because

of confidentiality agreements) which results in a small knowledge base overall (Daheim & Uerz, 2008).

3.2. Data Gathering Methodology

The data in this paper is primarily gathered by the AI-based research engines "Iris.ai" and "Semantic Scholar" but cross-checked with the traditional databases Elsevier (Science Direct), JSTOR (Journal Storage), and SAGE Journals. The reason for this selection, the potential benefits of the AI-based engines, the motivation behind the cross-checking approach, and an explanation of which data will be extracted for the literature review are described below.

In short, the two primarily used search engines use artificial intelligence to understand the semantics of scientific literature to improve the research process and its findings (Extance, 2018). In theory, the tools offer the potential to increase the breadth of data and make the findings more reproducible while enabling a faster data gathering process (Extance, 2018). Iris.ai does that by receiving a paper or a

problem statement as an input and then "fingerprinting" the information based on extracted keywords, contextual synonyms, and hypernyms (Iris.ai, 2022). This fingerprint is then matched against >200M papers to create an "explore map" of connected papers that can be narrowed down into a precise reading list (Iris.ai, 2022). Semantic Scholar resembles traditional search tools but provides additional, more focused information (Extance, 2018). It advances search through capturing popularity metrics, indirect citations, data sets, methods, and connections of relevant articles (Extance, 2018). It uses NLP to extract information from papers to build a reading list that can be adapted iteratively (Extance, 2018).

In addition, Elsevier, JSTOR, and SAGE Journals are used as secondary sources to find relevant research for two main reasons: Firstly, the two AI research engines are not fully established yet which makes their exhaustiveness questionable. Therefore, those databases that cover "the vast majority" of foresight literature (Iden et al., 2017; Marinković, Al-Tabbaa, Khan, & Wu, 2022) are used to ensure that the literature review in this paper provides a comprehensive overview. Secondly, the two AI engines are used in an effort to assess the current maturity and convenience of such search tools as a methodological innovation. Cross-checking the covered literature with the traditionally recognized databases will allow conclusions on this matter (see chapter 5.3).

The type of data gathered for the literature review differs between the quantitative and qualitative components: For the quantitative review, the title, author/s, publishing date, thematical focus, research design, and theoretical basis of each identified paper are extracted. This information is collected in an excel sheet and functions as the basis for a statistical display (chapter 4.1). For the two qualitative components, the findings of relevant papers covering the observed topics are extracted, summarized, and contrasted to build well-founded answers to the research questions. Here, the data is not used in isolation but in the context of its respective study.

3.3. Data Analysis Methodology

The analysis of the gathered data will be done manually, due to the engine's limitations in that aspect. Here, it must again be distinguished between the methodology for the quantitative and qualitative components of the literature review. The following paragraphs explain how the analyses for each part are conducted and how the findings of this process are synthesized.

Firstly, the analysis in the quantitative review will be a statistical assessment that aims to showcase trends and gaps in the existing literature based on a nominal categorization of identified articles. More precisely, the extracted data is used to display how the number of yearly publications changed over time as well as how those publications are distributed among different journals and researchers. Further, the articles are categorized according to their research design and thematical focus to point out what researchers have historically focused on and how they achieved their findings. The categorization of the research design follows the schema of Orlikowski and Baroudi (1991): The contributions are grouped into either conceptual (frameworks, models, reviews) or empirical designs (surveys, interviews, case studies, experiments). The different thematical foci were established by reading (parts of) the articles in the sample and split into antecedents, foresight capability, organizational foundations, individual micro-foundations, moderators, and outcomes of foresight. The analysis of this categorization is done in Excel and displayed graphically in the text while the raw data is shown in Appendix A. In addition to its objective of organizing the field, this analysis functions as the basis for the succeeding qualitative analyses since the categorization filters out papers on capabilities for successful strategic foresight (capability) and its impact on firm performance (firm performance).

Those papers are then analyzed in more detail and synthesized in the qualitative, systematic literature reviews. The qualitative analysis of the papers' findings is done deductively by reading text elements word by word. Then, narrative syntheses are created due to their suitability to create comprehensive overviews of heterogenous fields (Marinković et al., 2022). This enables a display of the combined research findings in a "storytelling-manner" (Bailey, 2006) that is continued iteratively until well-founded answers to the two research questions (Q2-3) are found. Since empirical research on necessary capabilities for successful strategic foresight is limited, the analysis builds on conceptual frameworks rather than practical evidence: Competency / Capability models that suggest components of foresight capability and measure the level of individual or organizational foresight capability are introduced and compared to draw conclusions on overarching strategic foresight capability. If those models were already tested empirically on their connection to firm performance, those results are also presented. Next, the paper provides an analysis regarding the findings on strategic foresight's impact on firm performance. Here, firm performance is not confined to external results but also includes internal outcomes like improved innovation capabilities that do not yield instant (external) returns. The objective of this analysis is to build a theoretical basis for future research on these frontiers as well as to contextualize the findings within the organizing framework developed in chapter 4.1.3. However, the paper does not aspire to provide a complete overview that includes all studies but rather aims to incorporate respected ideas and defining trends. While the thematical literature review presents those ideas, the subsequent discussion will put them into perspective.

4. Themes in Strategic Foresight Research

This systematic literature review is split into three different components: First, the current state of strategic foresight research is displayed quantitatively to point out trends, display gaps, and create an organizing framework of the field. Second, qualitative findings on necessary capabilities for successful foresight as well as moderators for foresight's success

are explained. Third, findings on successful foresight's impact on firm performance are compiled in the final section.

4.1. Current State of Strategic Foresight Research

In this first part of the review, the existing literature on strategic foresight is displayed in an effort to provide more transparency in the developing field. In the first two sections (4.1.1 and 4.1.2), the goal is to quantitatively show the existing research and point out research streams. In the third section (4.1.3) the aim is to contextualize this existing literature in an organizing model to showcase links, gaps, and trajectories. In combination, the sections provide the basis to answer research question Q1 ("What is the current state of strategic foresight research?").

4.1.1. Descriptive Trends in Strategic Foresight Research

Similar to preceding reviews (e.g., Iden et al., 2017; Singh, Dhir, Das, & Sharma, 2020), this study finds that the number of yearly publications has been steadily increasing since environmental uncertainty created interest in strategic foresight (Gordon et al., 2020). Overall, this literature review compiles 243 journal-published articles on strategic foresight and finds a CAGR of 9% in yearly publications between 2000-2022. Of those articles, only 18% were published before 2010 while around 57% of all papers were published from 2015 to 2000. The year with the most yearly publications is 2020 with 26 articles (11%) followed by 25 articles in 2015 (10%). When combined, the timeframe 2010-2022 constitutes 82% of all publications on strategic foresight which is congruent with other studies that point out the growing scientific importance of the topic (e.g., Marinković et al., 2022; Rohrbeck, Battistella, & Huizingh, 2015). Figure 2 illustrates this development.

Those publications stem from a variety of different publishers ranging from business- and management reviews to technology journals. In this paper's sample, around a third of all identified articles (n=80) were published in the journal Technological Forecasting and Social Change (33%). Following that, around 19% were published in Futures (n=46) and 8% in Technology Analysis & Strategic Management (n=20). Those three journals historically offer the highest research output on strategic foresight and constitute approximately 60% of all articles in the sample. The remaining publications span a total of 66 different journals with various foci. Table 1 briefly illustrates the literature's split between some of the journals while the full breakdown can be found in Appendix A. Here, it must be noted that a significant number of publications (n=142) stems from journals with a comparatively low ranking (AJG Ranking 2021: <= 2) while only very few (n=4) were published in highly reputable (management) journals (AJG Ranking 2021: > 3). This is in line with the critique that foresight research is insufficiently linked to relevant debates in respected management journals (Rohrbeck, Battistella, & Huizingh, 2015) and again points out that the still nascent field must develop its foundations (Piirainen & Gonzalez, 2015).

The authors of those articles are numerous with a total of 419 different researchers that contributed to journal-published articles. Some of the researchers with the highest quantitative output are Rohrbeck (n=14), Sarpong (n=12), Vecchiato (n=7), and Wright (n=6). A more extensive breakdown of the different authors is displayed in Table 2. Congruent with Iden et al. (2017), this breakdown indicates that historically a dominant proportion of foresight research was conducted by European scholars. Regarding research designs, this paper uses the categorization of Orlikowski and Baroudi (1991) into conceptual and empirical designs. Here, the conceptual design groups all articles that create concepts, frameworks, or models (including literature reviews) while empirical research covers all approaches that utilize some form of empirical data (e.g., surveys, interviews, case studies, experiments, or data mining). In the sample, the most prominent research design are conceptual approaches (n=107) followed by case studies (n=88) and surveys (n=26). For mixed approaches (e.g., case study with interviews) the studies were categorized according to the "dominant" approach. The breakdown of used approaches is illustrated in Table 3. This breakdown implies that strategic foresight research mostly builds on qualitative approaches which seems logical since foresight was developed as an addition to traditionally quantitative forecasting (Marinković et al., 2022; Martin, 2010).

Overall, this display of trends in the foresight field is in line with existing reviews but provides an updated, more extensive picture. The display shows that publications on strategic foresight are becoming more frequent and span a broader range of journals and researchers. While the topic is gaining importance, its relevance for the general management discourse is still limited. Many scholars attribute this to differing or unclear theoretical foundations between studies (Piirainen & Gonzalez, 2015). Thus, some of the most relevant foundations are explained next.

4.1.2. Theoretical Research Streams in Foresight Studies

As mentioned in the introduction, researchers argue that many articles in the foresight field lack a clear theoretical foundation (Piirainen & Gonzalez, 2015). This argument is supported by the observations of this paper which found that around 35% (n=85) of the articles in the final sample do not build on a specific theoretical concept. For the remaining articles, the authors based their work on various theories with network theory, dynamic capabilities, and organizational learning as the most frequently used examples. Those theories and the frequency of their usage are illustrated in Table 4 and briefly put into context in the following paragraphs.

Firstly, dynamic capabilities theory explains how organizations can ensure competitiveness through developing certain organizational capabilities (Teece, Pisano, & Shuen, 1997). This theory conceptualizes foresight as a micro-foundation or antecedent for such capabilities (e.g., Haarhaus & Liening, 2020) or even suggests foresight as a distinct organizational capability in itself (e.g., Pulsiri & Vatananan-Thesenvitz, 2021; Rhisiart, Miller, & Brooks,
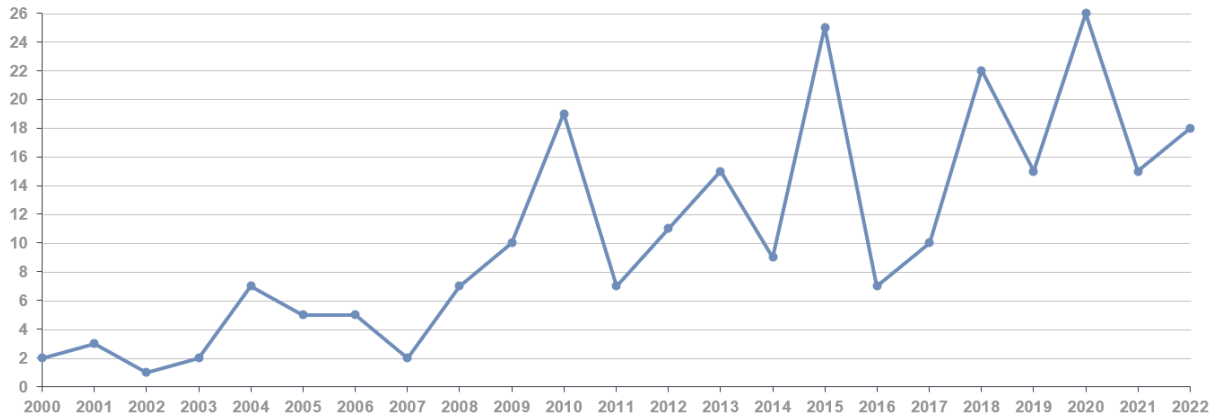
Figure 2: Yearly Publications from 2000-08/2022 (Own Illustration).

Table 1: Number of publications in different journals.

Journal	Articles	Percentage
Technological Forecasting and Social Change	80	33
Futures	46	19
Technology Analysis & Strategic Management	20	8
Foresight	11	5
World Futures Review	4	2
IEEE Transactions on Engineering Management	4	2
Journal of Futures Studies	3	1
Long Range Planning	3	1
Other Journals (number of articles per journal <= 2)	72	29
Total	243	100

Table 2: Most frequently published Researchers.

Researchers	Country	Contributions
Rohrbeck	Denmark	14
Sarpong	UK	12
Vecchiato	Italy	7
Von der Gracht	Germany	6
Wright	UK	6
Burt	UK	5
Gordon	UK	5
Others (n=412)	-	466

Table 3: Used Research Designs.

Research Methods	Articles	Percentage
Conceptual	107	44
Empirical	136	56
- Case Studies	88	36
- Surveys	26	11
- Interviews	13	5
- Experiments	5	2
- Data Mining	3	2

Table 4: Theoretical Foundations and Research Streams in the Foresight field.

Theoretical Foundation	# Articles	Percentage	Influential Studies
Dynamic Capabilities	36	15	Haarhaus & Liening, 2020; Pulsiri & Vatananan-Thesenvitz, 2021; Ramírez, Österman, & Grönquist, 2013
Network Theory	21	9	Calof, Arcos, & Sewdass, 2018, Adegbile, Sarpong, & Meissner, 2017; Heger & Boman, 2015; Nugroho & Saritas, 2009; Van der Duin, Heger, & Schlesinger, 2014; Weber, Sailer, & Katzy, 2015
Organizational Learning	45	18	Bootz, Monti, Durance, Pacini, & Chapuy, 2019; Bootz, 2010; Eskandari, Mohammadi, & Rahimi, 2020; Peterson & Wu, 2021; Pulsiri & Vatananan-Thesenvitz, 2021; Yoon et al., 2018
Others	56	23	-
No Theoretical Foundation	85	35	-

2015). Therefore, foresight is either understood as an individual phenomenon (micro-foundation) or on an organizational level (capability) which again illustrates the problem of competing epistemologies (Sarpong, Maclean, & Davies, 2013). Regardless, this theoretical foundation sees the cultivation of foresight and other organizational capabilities as a desirable outcome that can grant a competitive advantage (Vecchiato, 2015).

Secondly, network theory explains an organization and its environment as a network of relationships and views foresight as a facilitator for such relations (e.g., Heger & Boman, 2015; Nugroho & Saritas, 2009). This is a newer theoretical foundation that was initiated by more collaborative, open foresight activities in practice that contrast with earlier, less participative foresight processes (Wiener, Gattringer, & Strehl, 2020). Research on this foundation covers both, inter-personal and inter-organizational relations and is often connected to observing foresight's impact on innovation capabilities (Heger & Boman, 2015). Therefore, it tries to understand the consequences of process designs and organizational integration which suggests an organization-level analysis of foresight (Rohrbeck, Battistella, & Huizingh, 2015). In the organizing framework developed in the next chapter, it would consequently be categorized as a foundation for foresight capability.

Thirdly, organizational learning theory explains how organizations generate knowledge (through foresight) and how this knowledge is then transferred between its members (Bootz et al., 2019; Yoon et al., 2018). It covers how foresight influences an organization's learning curve and illustrates how knowledge is created and retained over time (Bootz, 2010; Peterson & Wu, 2021). Research based on this theoretical foundation often observes how foresight processes should be organized to ensure the best learnings for both organizations and individuals (Gattringer & Wiener, 2020). Organizational learning, therefore, analyzes foresight at an organizational level but also includes the individual level as a micro-foundation (Hines & Gold, 2015).

While those three theories are examples of used foundations for foresight research, more than a third of the studies (n=85) in the paper's sample do not build on one clear theo-

retical concept. Earlier reviews also pointed this fact out and emphasized that it is a major issue that hampers theoretical progress in the developing field (Adegbile et al., 2017; Iden et al., 2017). Therefore, creating a unified theoretical foundation is an important, unsolved issue for future research.

4.1.3. Organizing Framework of Strategic Foresight Research

The screening of articles in this quantitative review enabled the identification of theoretical foci of papers in the foresight field. This knowledge was used to develop an organizing framework for strategic foresight research which is displayed in Figure 3. The identified foci/themes are (1) antecedents of strategic foresight, (2) foresight capability, (3) organizational foundations, (4) individual microfoundations, (5) moderators, as well as (5) foresight's impact on firm performance. The relations between those topics are displayed through arrows. Here, dotted lines suggest uncertain relations with little conducted research while solid lines show an intensively researched connection. The main quantitative (number of articles) and qualitative insights (subtopics) of the six themes are explained below while the findings on foresight capability, moderators, and firm performance are discussed in more detail in chapters 4.2 and 4.3.

This process model organizes existing research on strategic foresight and emphasizes that the different themes are interconnected. Once again, this model shows that differentiation between individual-level and organization-level foresight is necessary and that the exact relation between those dimensions is uncertain. While the model suggests that the organizational level builds on individual micro-foundations, research does not attest to how exactly the dimensions influence each other (Sarpong, Maclean, & Davies, 2013). Nevertheless, the organizing model presents a research-based perspective of the relevant relations and points out what scholars have historically focused on. Those six themes and their components are explained in the following paragraphs.

First, multiple journal-published articles focus on organizational antecedents for strategic foresight. To be exact, a total of 63 publications out of the sample (n=243) dealt with
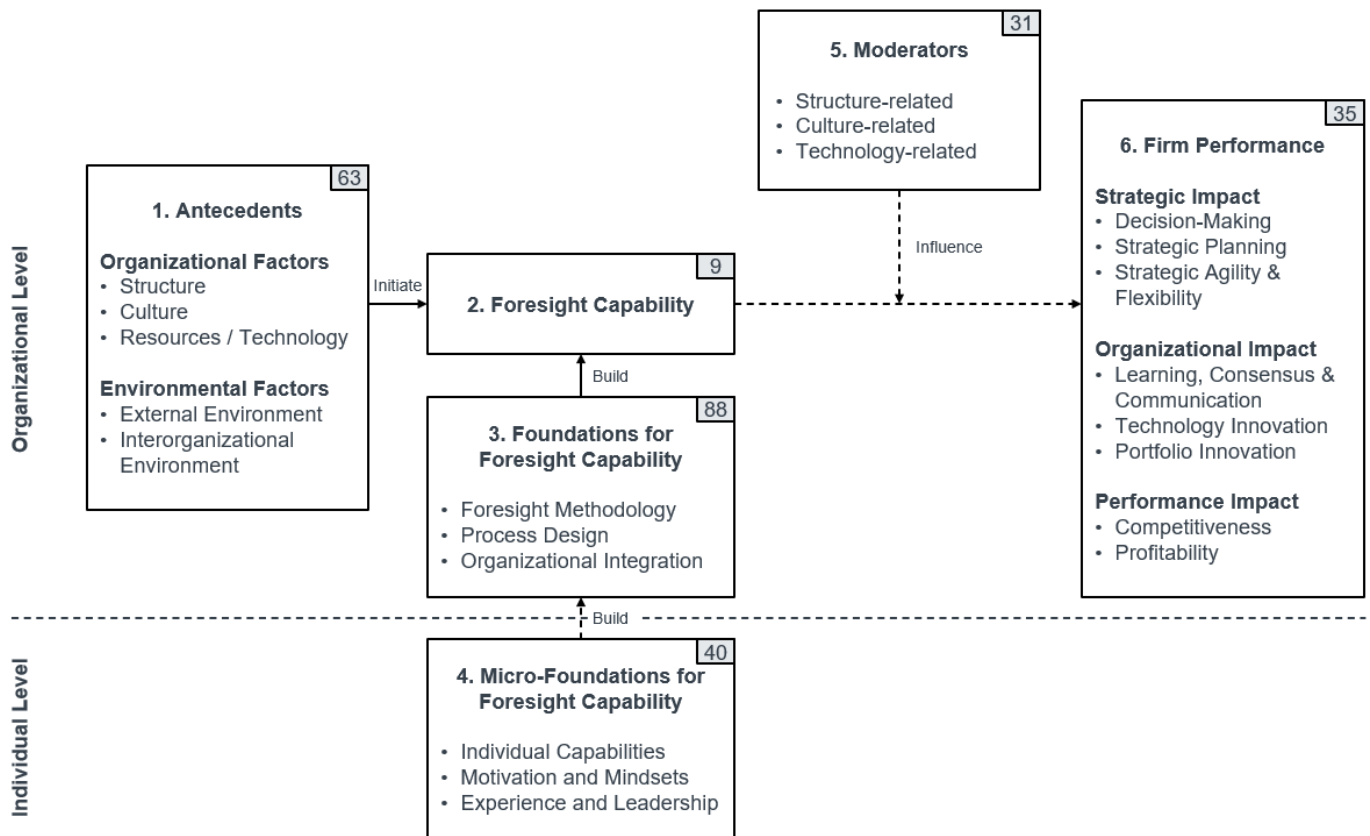
Figure 3: Organizing Framework for Strategic Foresight Research (Own Illustration).

antecedents which can be differentiated into organizational and environmental factors. Organizational factors mostly concern the structure (e.g., Ahlqvist & Kohl, 2016; Battistella, 2014), culture (e.g., Haarhaus & Liening, 2020; Wiener, Gattringer, & Strehl, 2018), and resources (e.g., Ghayoor, Rastegari, & Hosseini, 2020; Greenblott, O'Farrell, Olson, & Burchard, 2019) of an organization with foresight practices. Further, environmental antecedents are split into external (e.g., Costanzo, 2004; Vecchiato, 2012) and internal environments (Savioz & Blum, 2002; Wiener et al., 2018) and try to understand the faced uncertainty. These types of antecedents affect foresight activities (and their success) and were, therefore, sometimes not only analyzed in isolation but also in their moderating role (see chapter 4.2.4).

Second, a thematical focus in the foresight field is organizational foresight capability and its mediating effect for foresight's outcomes. In the sample, 9 articles were identified that primarily deal with foresight capability and provide frameworks that conceptualize and measure the phenomenon (e.g., Day & Schoemaker, 2005; Rohrbeck & Kum, 2018). Those articles conceptually propose what overarching capabilities are necessary to conduct foresight successfully and offer approaches to measure the maturity of those capabilities (e.g., Grim, 2009; Rohrbeck, 2010). Some articles go further and empirically investigate how the attained maturities impact outcomes of foresight activities manifested in firm performance (e.g., Rohrbeck & Kum, 2018). However,

there is limited empirical evidence on the exact effect that the proposed capabilities have on firm performance in isolation and it is unclear how the (foresight) capabilities of individuals affect foresight capability at an organizational level (Daheim & Uerz, 2008). Overall, foresight capability is a theme with comparably low research output despite its perceived practical relevance (Hines, 2020). More research was conducted on foundations and micro-foundations that affect the attained capabilities. They are explained in the following two paragraphs.

Third, the organizational foundations for foresight capabilities are a prevalent research topic. In total, 88 articles in the sample with this thematical focus were identified and differentiated between foresight methodology, process design, and organizational integration of foresight. Regarding foresight methodology, research focused mainly on used tools (e.g., Godet, 2000; Idoko & MacKay, 2021), technological aids (e.g., Boe-Lillegraven & Monterde, 2015; Gibson, Dime, Garces, & Dabich, 2018), and information systems that guided foresight (e.g., Arokodare, Makinde, & Fakunmoju, 2020; Von der Gracht, Bañuls, Turoff, Skulimowski, & Gordon, 2015). Studies on process design rather focused on how foresight activities are organized and differentiate between non-participative (e.g., Djuricic & Bootz, 2019; Dufva & Ahlqvist, 2015), participative (e.g., Heger & Boman, 2015; Heger & Rohrbeck, 2012), collaborative (e.g., Gattringer, Wiener, & Strehl, 2017; Weigand, Flanagan, Dye, & Jones,

2014), and network foresight processes (e.g., Nugroho & Saritas, 2009; Van der Duin et al., 2014). Finally, studies investigated how foresight is institutionalized and integrated into an organization (e.g., Paliokaitė et al., 2014). Those different factors are believed to directly affect firms' foresight capability and indirectly impact the achieved final outcomes as moderators (Rohrbeck & Gemünden, 2011).

Fourth, a theme in foresight research are the individual micro-foundations for organizational foresight capabilities. Here, a total of 40 articles in the sample were identified that cover individual foresight capabilities as well as other personal factors like motivations, mindsets, experiences, and leadership in foresight activities. Articles on individual foresight capability assess which capabilities individuals require to be "good futurists" and sometimes propose models to measure the maturity of those individual capabilities or "overall capability" (e.g., Hines et al., 2017; Rhisiart et al., 2015). Here, it is still unclear how those capabilities translate to organizational foresight capability when aggregated. Regarding personal factors, the most frequently researched subtopics are mindsets and motivations for foresight (e.g., Reid & Zyglidopoulos, 2004; Vecchiato & Roveda, 2010a), experiences in practice (e.g., Costanzo, 2004; De Smedt, Borch, & Fuller, 2013), as well as leadership styles and their relation to foresight (e.g., Luzinski, 2014; Moore, 2018; Reimers-Hild, 2018). Those factors are sometimes not only seen as direct micro-foundations for organizational foresight capability but also as moderators for foresight's impact on firm performance (e.g., Haarhaus & Liening, 2020; Wiener et al., 2020).

Fifth, a thematical focus in foresight research are moderators for the relation of foresight activities and their outcomes as well as the potential effects those moderators can have. In total, 31 articles in the sample were identified that study different types of moderators that can broadly be categorized as structure-related, culture-related, and technology-related moderators. Regarding structure-related moderators, prominently mentioned themes are hierarchical structures, the institutionalization of foresight activities, and their process designs (e.g., Haarhaus & Liening, 2020; Vecchiato, 2020). Culture-related aspects that are considered as moderators are shared values, managerial mindsets, and the overarching organizational culture (e.g., Wiener et al., 2020; Yoon, Kim, Vonortas, & Han, 2019). Lastly, technology-related moderators are the technologies used directly to conduct foresight activities and also information technologies that indirectly affect the process (e.g., Heger & Boman, 2015; Rohrbeck & Gemünden, 2011). Generally, research suggests that all those moderators can facilitate or inhibit positive outcomes of foresight activities (Sarpong, Maclean, & Davies, 2013). While the research output on such moderators is also rather limited, the number of publications has steadily increased in recent years.

Sixth, a focus of foresight research lies on the outcomes of foresight activities and their impact on firm performance. In the sample, a total of 35 articles with a focus on such outcomes were identified. Those articles do not only cover foresight's impact on external performance but also concern foresight's internal impact on a firm's strategy, organization, and innovation. Researched subtopics of the strategic impact are decision-making, strategic planning as well as strategic flexibility and agility (e.g., Gershman, Bredikhin, & Vishnevskiy, 2016; Haarhaus & Liening, 2020; Schwarz, Ram, & Rohrbeck, 2019). The research on organizational outcomes focused mainly on learning, communication, and innovation (e.g., Paliokaitė & Pačėsa, 2015; Schweitzer, Hofmann, & Meinheit, 2019; Wiener et al., 2020). Lastly, the impact on external performance was researched less frequently but some studies do examine foresight's impact on competitiveness and profitability (e.g., Arokodare & Asikhia, 2021; Boe-Lillegraven & Monterde, 2015; Rohrbeck & Kum, 2018).

Overall, those six themes organize the current knowledge on strategic foresight and the mediating role of foresight capabilities for organizational performance. Since the theoretical progress on foresight capabilities, moderators, and firm performance is rather slow while the other themes have already intensively been researched, the following chapters will explain the state of the three mentioned themes in more detail. This is done in an effort to provide a solid foundation for future research to accelerate research output. The aim here is to display driving ideas and concepts that scholars can use in their (empirical) studies to advance research and practice.

4.2. Necessary Capabilities for Successful Strategic Foresight

Research on necessary capabilities for successful strategic foresight is rather limited and opaque. However, some studies conceptualize foresight's success and provide practical implications through developing conceptual models that suggest necessary capabilities and their measurement. These models, categorized into frameworks for (1) individual and (2) organizational foresight capability, are explained and contrasted in the following paragraphs. Since research (implicitly) suggests foresight capability as a mediator for foresight's outcomes, this chapter is rounded off with insights on relevant moderators that also affect this relationship. Through this display, the chapter aims to provide the basis to answer the second research question Q2 of this paper ("Which capabilities do firms need for successful strategic foresight?").

4.2.1. Conceptualization of Successful Foresight

In order to discuss necessary capabilities for successful strategic foresight, it must first be established what success in the foresight field consists of. While there is no clear definition or measurement of successful foresight (Amsteus, 2008), there are articles that provide conceptual descriptions and suggest different components of success in foresight. The following paragraphs describe those components before the measurement of overall success in foresight activities is explained. This poses as the foundation for the discussion of foresight capability.

Table 5: Foresight Capability Research Structure.

Research Theme	Topic	Influential Studies
Conceptualization of Successful Foresight	I. Components of Successful Strategic Foresight	Aichouni, Touahmia, Kolsi, Alghamdi, & Al-Homaid, 2021; Iden et al., 2017; Maertins, 2016; Aichouni et al., 2021; van der Laan & Erwee, 2012; Bezold, 2010; Rasmussen, Andersen, & Borch, 2010; Amsteus, 2008; Wright, Van der Heijden, Burt, Bradfield, & Cairns, 2008
	II. Measuring Foresight's Success	Rincón & Díaz-Domínguez, 2022; Rohrbeck & Kum, 2018; Boe-Lillegraven & Monterde, 2015; Vecchiato, 2012; Amsteus, 2008
Individual Strategic Foresight Capability	I. Foresight Competency Model (FCM)	Hines et al., 2017; Rincón & Díaz-Domínguez, 2022
	II. Futures Literacy Framework (FLF)	Miller, 2018; Miller & Sandford, 2019; Hines et al., 2017; Rincón & Díaz-Domínguez, 2022
Organizational Strategic Foresight Capability	I. Peripheral Vision Capabilities	Day & Schoemaker, 2005
	II. Foresight Maturity Model (FMM)	Grim, 2009; Day & Schoemaker, 2005
	III. Maturity Model of Corporate Foresight	Rohrbeck, 2010; Grim, 2009; Day & Schoemaker, 2005
	IV. Future Preparedness Model (FP)	Rohrbeck & Kum, 2018; Rohrbeck, 2010; Grim, 2009; Day & Schoemaker, 2005
Moderators for Strategic Foresight's Success	I. Structure-related Moderators	Vecchiato, 2020; Haarhaus & Liening, 2020; Rohrbeck & Kum, 2018; Peter & Jarratt, 2015; Farrington, Henson, & Crews, 2012; Rohrbeck & Gemünden, 2011
	II. Culture-related Moderators	Wiener et al., 2020; Haarhaus & Liening, 2020; Yoon et al., 2019; Schwarz et al., 2019; Sarpong & Maclean, 2016; Peter & Jarratt, 2015; Daheim & Uerz, 2008
	III. Technology-related Moderators	Haarhaus & Liening, 2020; Heger & Boman, 2015; Rohrbeck, Battistella, & Huizingh, 2015; Van der Duin et al., 2014; Rohrbeck & Gemünden, 2011

Research points out that the main motivations for foresight are improving decision-making, long-term planning, and innovation capabilities as well as earlier identification and reaction to environmental changes (Rasmussen et al., 2010). Therefore, many articles define success as the achievement of those objectives through employing organizational foresight (e.g., Aichouni et al., 2021; Iden et al., 2017; Maertins, 2016). Others focus on final outcomes and describe successful foresight as foresight activities that have a positive (financial) impact on organizations overall (Bezold, 2010; van der Laan & Erwee, 2012). Therefore, whether foresight is "successful" depends on subjective organizational goals and their attainment (Maertins, 2016).

Further, it is often difficult to measure whether those goals are attained due to their predominantly qualitative nature (Rasmussen et al., 2010): Success of foresight activities is often only vaguely assessed in the long term (Boe-Lillegraven & Monterde, 2015; Vecchiato, 2012). However, scholars suggest that certain capabilities can ensure that foresight activities are conducted in a way that makes success more probable either way (e.g., Hines et al., 2017; Iden et al., 2017; Rohrbeck & Kum, 2018). Therefore, this paper defines "successful foresight" as foresight that yields positive outcomes for an organization's objectives and sees "necessary capabilities" as capabilities that make such positive outcomes more probable. Conceptual frameworks, in which such capabilities were defined, are introduced in the following sections.

4.2.2. Individual Foresight Capability

As mentioned in the introduction, research either conceptualizes strategic foresight as an individual or organizational phenomenon (Rohrbeck & Kum, 2018). Therefore, foresight capability is currently assessed and measured in different dimensions by different models. While the paper mainly focuses on organization-level foresight, this section provides information on individual foresight capability to ensure exhaustiveness since this concept, on aggregate, also affects foresight's impact on firm performance (Hines et al., 2017; Rohrbeck & Kum, 2018). The two most influential models in this category, the "Foresight Competency Model" by Hines et al. (2017) and the "Futures Literacy Framework" by Miller (2018), are described below.

Hines et al. (2017) see foresight as an individual, cognitive phenomenon as opposed to an organizational activity. They developed the Foresight Competency Model (FCM) to

identify capabilities necessary for individuals to become "successful futurists" and to measure individuals' foresight capability (Hines et al., 2017). In this model, they define foresight as an innate ability to "develop images of the future" that can be improved over time (Hines et al., 2017). Foresight capability is defined as a set of distinct individual capabilities needed to successfully conduct foresight (Hines et al., 2017). Those capabilities are segmented into six "core competencies" which are supported and contextualized by three "foundational competencies" and two "professional competencies" (Hines et al., 2017). The model suggests that at the core, a futurist must be able to scope projects (framing), explore change signals (scanning), identify possible futures (futuring), commit to a preferred future (visioning), develop results based on this information (designing), and stay flexible to alternative futures (adapting) (Hines et al., 2017). In addition, futurists require academic, personal and workplace skills (foundational competencies) as well as occupation and sector knowledge (professional competencies) to fully attain foresight capability (Hines et al., 2017). This is illustrated in Figure 4.

Overall, the Foresight Competency Model by Hines et al. (2017) sees foresight capability as an ability that is attained through the development of the above-mentioned competencies. By achieving proficiency in those competencies, individuals build foresight capability which can result in positive organizational outcomes (Hines et al., 2017). Hines et al. (2017), therefore, see foresight capability as a mediator for the activity-outcome relationship of foresight and suggests distinct capabilities that individuals can improve to facilitate positive outcomes.

The Futures Literacy Framework (FLF) by Miller (2018) also describes foresight as an individual phenomenon. In this model, "futures literacy" is defined as a capability that allows individuals to deliberately "use-the-future" and adapt the usage depending on its context and goal (Miller, 2018). In contrast to the Foresight Competency Model, this framework differentiates between non-conscious anticipation and conscious, learned anticipation which constitutes futures literacy (Miller & Sandford, 2019). According to Miller (2018), this perspective reinforces the idea that foresight capability as a skill can be developed and improved over time. This skill does not only involve dealing with the future itself but also further situational decisions: Individuals must know why and how they use the future based on the specific context (Miller & Sandford, 2019). Foresight capability, in this sense, describes the ability to utilize the future for distinct goals and to flexibly adapt the approach if necessary (Miller, 2018). Based on this definition, the Futures Literacy Framework provides a range of anticipatory systems to assist individual's foresight activities in different contexts (Miller, 2018). Overall, the model describes foresight capability more descriptive and theoretical than the Foresight Competency Model and does not mention specific capabilities necessary for success. Nevertheless, it offers practical implications by emphasizing the importance of foresight's context.

In conclusion, both discussed models on individual fore-sight capability see it as a developable ability that consists of distinct elements necessary to conduct successful foresight. While the models cover foresight capability on an individual level, research suggests that aggregated skills of individuals could hypothetically result in organizational foresight capability and influence the activity-outcome relationship of foresight processes. However, it is uncertain how the capability translates from an individual to an organizational level. Research on organizational foresight capability is presented next before moderators for foresight's success are introduced.

4.2.3. Organizational Foresight Capability

Other scholars define foresight as an organizational phenomenon and develop models to measure and understand its capability on this overarching level (e.g., Day & Schoemaker, 2005; Rohrbeck & Kum, 2018). The four most prominent models in this category are "Peripheral Vision Capabilities" by Day and Schoemaker (2005), the "Foresight Maturity Model" (FMM) by Grim (2009), the "Maturity Model of Corporate Foresight" by Rohrbeck (2010), and the "Future Preparedness Model" (FP) by Rohrbeck and Kum (2018). They conceptualize organizational foresight capability and offer practical implications for its development and outcomes. The following paragraphs introduce those models to draw conclusions on necessary capabilities.

The first model on this matter, developed by Day and Shoemaker (2005), describes organizational foresight capability as "Peripheral Vision Capabilities". Foresight capability in the model consists of two distinct elements: capability and need for peripheral vision (Day & Schoemaker, 2005). With this differentiation, the scholars emphasize that capability results from matching ability with need: While complex, volatile environments require high peripheral vision, stable environments have lower requirements (Day & Schoemaker, 2005). Further, "too much" peripheral vision for the specific environment can even be a disadvantage due to resulting neuroticism and inefficiencies (Day & Schoemaker, 2005; Rohrbeck & Kum, 2018). Day and Schoemaker (2005) propose that organizations must understand their need for peripheral vision by assessing the nature of their strategy as well as the volatility and complexity of their surroundings. Then, the organizational capability for peripheral vision can be assessed to determine the (relative) foresight capability (Day & Schoemaker, 2005). Peripheral vision capability in this model consists of five contextual elements: leadership orientation, strategy making, knowledge management, organizational configuration, and culture (Day & Schoemaker, 2005; Rohrbeck & Kum, 2018). The combination of those elements is illustrated in Figure 5.

In practice, the maturity of those elements is quantified through management surveys and compared to the organization's need for peripheral vision. This comparison results in an assessment of foresight capability and offers implications on areas to improve (Day & Schoemaker, 2005). Overall, an organization's match of peripheral vision capabilities needed and attained is assumed to determine foresight's effect on firm performance (Day & Schoemaker, 2005). There-
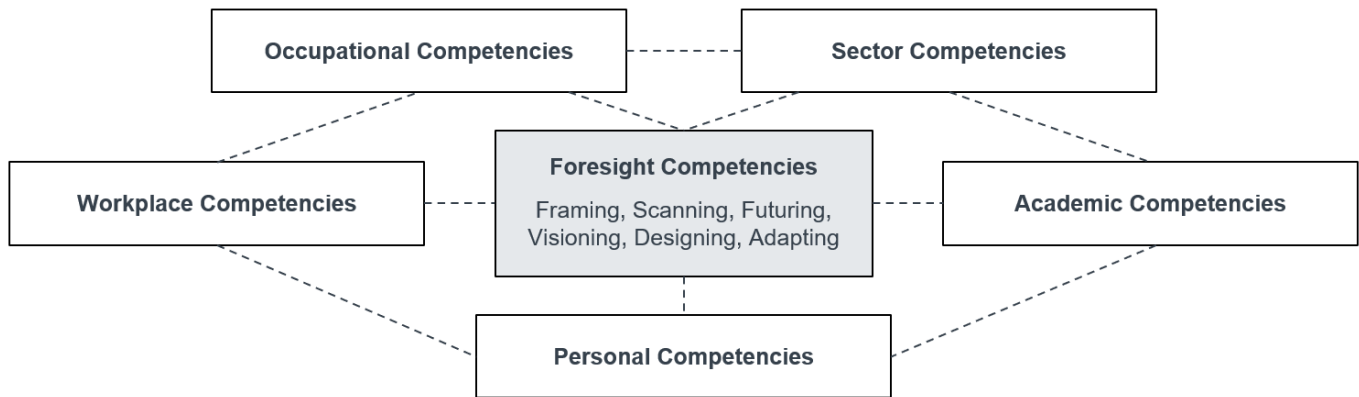
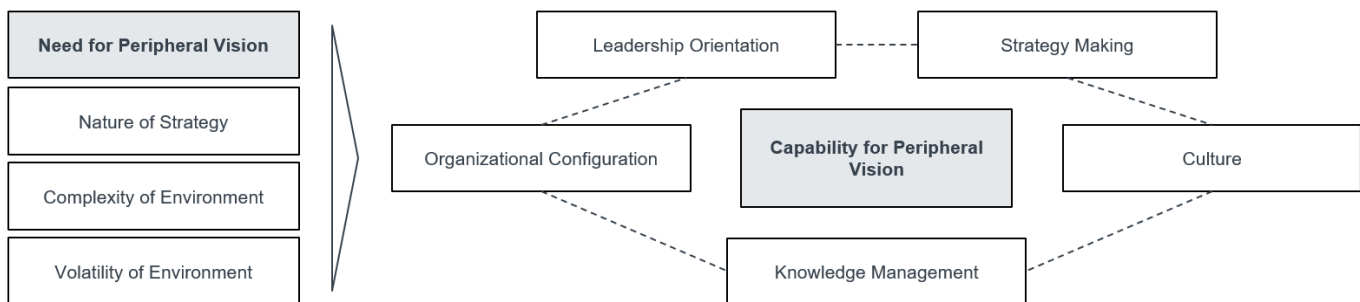**Figure 4:** Foresight Competency Model by Hines et al. (2017) (Own Illustration).

Figure 5: Peripheral Vision Capabilities by Day and Schoemaker (2005) (Own Illustration).

fore, Day and Schoemaker (2005) regard foresight capability as a mediator but imply that firms should not try to maximize the maturity of the mentioned elements (contextual foresight capabilities) but rather adapt it to its specific context in order to attain positive outcomes.

Second, Grim (2009) developed the Foresight Maturity Model (FMM) which defines best practices in foresight activities to assess organizational foresight capability. Those best practices are defined within six different "disciplines" (necessary capabilities) in the strategic foresight process which are leadership, framing, scanning, forecasting, visioning, and planning (Grim, 2009). Those disciplines are inspired by the early work of Hines et al. (2017) "Thinking about the Future" who later co-developed the previously introduced Foresight Competency Model (FCM). However, Grim (2009) covers those disciplines on an organizational level while Hines et al. (2017) described them as individual ("core") capabilities. In the FMM, Grim (2009) provides up to five best practices for each discipline and a maturity index with five levels. Those levels range from "ad hoc" to "world-class" maturity and aim to measure the performance and capability in each practice (Grim, 2009). This differentiation can be seen in Figure 6 below.

Foresight capability is then assessed by adding up the lowest score of each discipline to a total numerical score (Grim, 2009). This suggests that each discipline is only as mature as its weakest practice (Grim, 2009). Therefore, the Foresight Maturity Model defines foresight capability as a state

that is achieved by developing high maturity among all relevant practices and disciplines (Grim, 2009). Overall, the model developed by Grim (2009) identifies necessary processual capabilities (disciplines) and describes their components in more detail (best practices). In contrast to Day and Schoemaker (and more recent models), the FMM suggests that maximized proficiency (instead of relative) leads to positive performance implications (Grim, 2009). However, apart from this significant difference, the identified necessary capabilities (disciplines) are very similar to the suggestions of Day and Schoemaker (and more recent models).

Third, Rohrbeck (2010) created the Maturity Model of Corporate Foresight to further advance the assessment and development of organizational foresight capability. This model builds on insights from the existing models and adds complementing criteria identified in practice (Rohrbeck, 2010). As illustrated in Figure 7, the framework consists of three parts which are context, capabilities, and impact of foresight activities. "Context" is based on the idea of Day and Schoemaker (2005) that an organization's foresight requirements depend on its surroundings (Rohrbeck, 2010). However, further components like the size of the company, the corporate culture, and competitive dynamics are added (Rohrbeck, 2010). "Capabilities" are necessary abilities for successful foresight activities and are assessed on their maturity for dealing with discontinuous change (Rohrbeck, 2010). The different capabilities in this model are (1) information usage, (2) method sophistication, (3) people and networks,
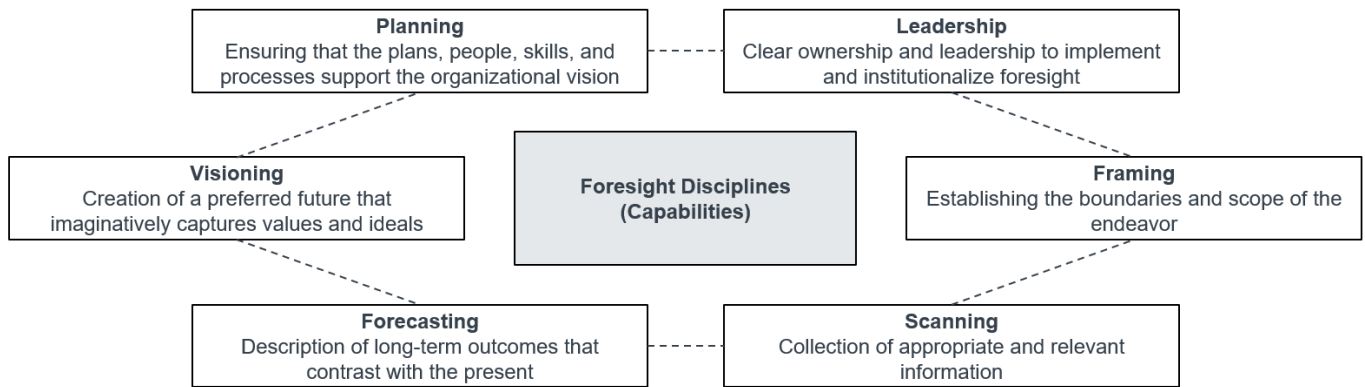
Figure 6: Maturity Index by Grim (2009) (Own Illustration).

(4) organization, and (5) culture (Rohrbeck, 2010). The maturity of each of those rather contextual capabilities is measured and summed up to draw conclusions regarding the foresight capability of a firm (Rohrbeck, 2010). The insights of this measurement are then used to assess foresight activities' "impact" and "value contribution" on firm performance to conclude whether foresight capability has a facilitating or inhibiting effect (Rohrbeck, 2012; Rohrbeck & Schwarz, 2013).

Overall, this model advances the existing frameworks by directly connecting foresight capability to foresight's success and impact on firm performance (Rohrbeck, 2012). Therefore, it does not only implicitly suggest foresight capability as a mediator for firm performance but conceptually and practically showcases the activity-outcome relationship. While this maturity model also emphasizes the importance of foresight's context, the proposed necessary capabilities differ from earlier models and focus on contextual rather than processual capabilities.

Most recently, Rohrbeck and Kum (2018) developed the Future Preparedness Model (FP) to further advance the conceptual models on organizational foresight capability. In this model, they tried to improve the measurability of existing elements and increase the link to firm performance (Rohrbeck & Kum, 2018). The model assesses two components which are the maturity and the need for foresight. The attained relative levels of those elements define the "future preparedness" of an organization (Rohrbeck & Kum, 2018). The maturity element builds directly on the Maturity Model of Rohrbeck (2010) but separates "people and networks" into two components and adds a supporting process layer (Rohrbeck & Kum, 2018). The processes in this layer are perceiving, prospecting, and probing and they group the practices (formerly capabilities) into three categories (Rohrbeck & Kum, 2018) as displayed in Figure 7.

On the other hand, the "foresight need" is assessed with an approach similar to Day and Schoemaker (2005) but normalized to a four-level scale (Rohrbeck & Kum, 2018). In combination, the optimum future preparedness is achieved when the needed foresight level is equal to the attained maturity level. Deviations from this optimum can occur with a

maturity that is either lower or higher than needed (Rohrbeck & Kum, 2018). Like Peripheral Vision Capabilities by Day and Schoemaker (2005), the model emphasizes that both, a lack of foresight and too much foresight, can harm firm performance (Rohrbeck & Kum, 2018). Once again, foresight capability is, therefore, not determined only by the maturity of foresight activities but by the match of need and maturity. Overall, the Future Preparedness Model provides adapted capabilities compared to the Maturity Model by Rohrbeck (2010) and integrates processual as well as contextual elements. Also, it directly links foresight capability to firm performance and empirically assesses its impact in a longitudinal study (Rohrbeck & Kum, 2018). This study identifies foresight capability as a mediator for foresight's success and shows that attained capability can lead to higher profitability and market share growth (Rohrbeck & Kum, 2018).

This concludes the existing findings on foresight capability. Research suggests that certain processual and contextual capabilities can facilitate successful foresight and lead to positive outcomes (e.g., Rohrbeck, 2012; Rohrbeck & Kum, 2018; Yoon et al., 2018). Foresight capability is identified as a mediator for foresight's impact on firm performance. However, it remains unclear how foresight's foundations and micro-foundations affect organizational foresight capability and how individual capabilities translate to an organizational level. Further, the exact mediating impact on firm performance is unclear because of relevant moderators and limited empirical studies. To increase transparency, those moderators are discussed in the next chapter.

4.2.4. Moderators for Strategic Foresight's Success

While foresight capability influences the outcomes of foresight practices, some moderators also positively or negatively affect this relationship. According to Sarpong, Maclean, and Alexander (2013), they can either be facilitators or inhibitors for positive outcomes from strategic foresight and are, therefore, important to consider in practice. Those moderators are broadly separated into structural, cultural, and technological moderators in this paper and are displayed in detail below.

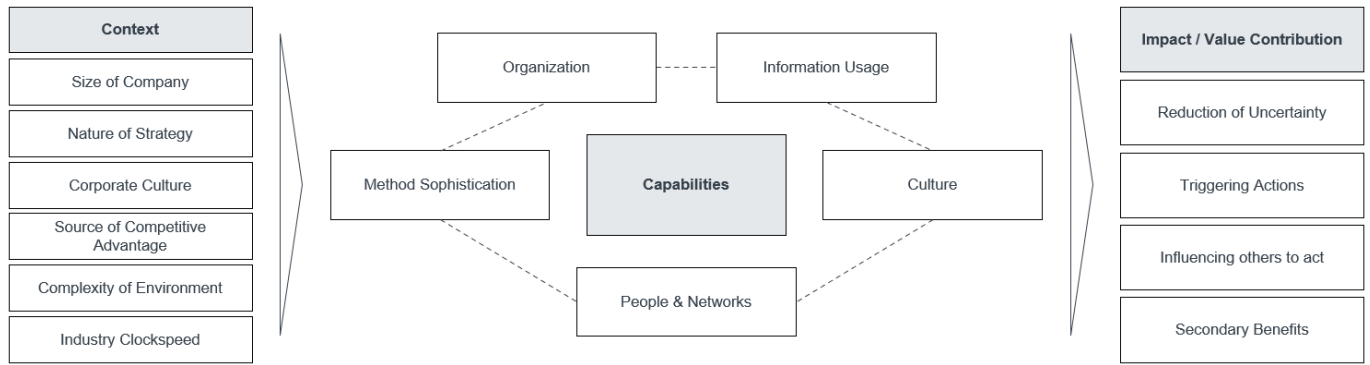First, structure-related moderators capture all elements

Figure 7: Maturity Model of Corporate Foresight of Rohrbeck (2010) (Own Illustration).
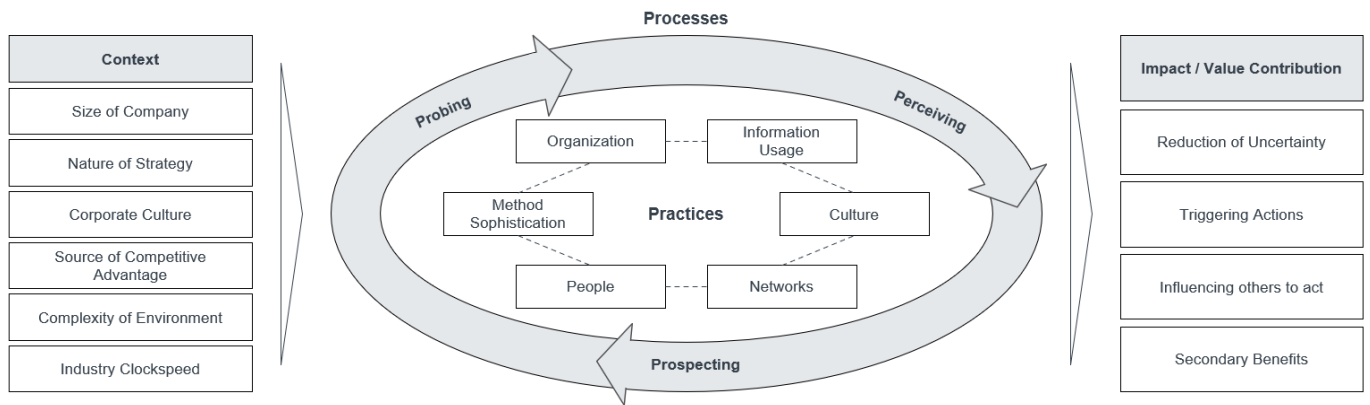

Figure 8: Future Preparedness Model by Rohrbeck and Kum (2018) (Own Illustration).

related to organizational design or process structures. Existing research displays that such formal structures influence the outcomes of foresight practices (e.g., Daheim & Uerz, 2008; Peter & Jarratt, 2015). Regarding organizational design, findings suggest that flat hierarchies facilitate positive outcomes while complex, hierarchical designs can impede foresight's success (Costanzo, 2004). Further, research emphasizes that foresight's impact is improved by institutionalizing foresight activities (e.g., in separate organizational units) since this allows unbiased processes with little dependence on individuals (Milshina & Vishnevskiy, 2018; Rohrbeck & Kum, 2018; Wiener et al., 2020). Meanwhile, research also suggests that some flexibility is necessary since strictly institutionalized foresight practices can lead to organizational blindness that results in foresight failures and further disadvantages (Costanzo, 2004; Ruff, 2015). Regarding process structures, research suggests that the linkage of foresight activities and strategic processes crucially affects foresight outcomes (Farrington et al., 2012; Rohrbeck & Kum, 2018). In particular, missing structure and integration negatively influences achieved results and can cause uncertainty regarding foresight legitimation (Daheim & Uerz, 2008; Milshina & Vishnevskiy, 2018). This can lead to dissatisfaction among involved individuals and cause organizational inertia (Daheim & Uerz, 2008; Haarhaus & Liening, 2020; Vecchiato, 2020). In contrast, research shows that if foresight is

embedded in strategic decision-making and backed by the management, final outcomes are improved (e.g., Battistella, 2014; Rohrbeck & Schwarz, 2013; Tapinos, 2013).

Second, culture-related moderators comprise the openness of organizational culture, shared values, and managerial mindsets as elements that affect foresight's outcomes. Regarding cultural openness, research suggests that open-minded cultures facilitate successful foresight and positive implications while a restrictive culture can have a negative effect (Daheim & Uerz, 2008; Major & Cordey-Hayes, 2000; Ruff, 2006). This is in line with the finding that more communication and collaborative foresight positively influence the achieved outcomes (Haarhaus & Liening, 2020; Sarpong & Maclean, 2016; Savioz & Blum, 2002; Wiener et al., 2020). Further, research on shared values in strategic foresight processes emphasizes that they moderate the outcomes of foresight activities by positively or negatively affecting them. Several publications show that organizations require a shared set of values to develop a basis for successfully approaching the future together (Gattringer & Wiener, 2020; Sarpong, Maclean, & Davies, 2013). Here, different views and values are still possible as long as organizations have a shared overarching mindset (Boe-Lillegraven & Monterde, 2015). If this is not the case, different values can inhibit successful foresight and be a disadvantage (Sarpong, Maclean, & Davies, 2013). Lastly, research emphasizes the importance

of managerial mindsets for strategic foresight outcomes (Li & Sullivan, 2022). Findings suggest that a positive managerial attitude toward foresight, change, and the future enables positive outcomes from foresight activities (e.g., Haarhaus & Liening, 2020; Klos & Spieth, 2021; Peter & Jarratt, 2015; Rohrbeck & Schwarz, 2013). In contrast, negative mindsets and past-focused management styles negatively impact foresight's success (Haarhaus & Liening, 2020; Major & Cordey-Hayes, 2000). Research points out that the mindsets of middle managers are particularly important since they actively implement the strategies developed through foresight and, therefore, heavily affect the impact on organizations and their performance (Darkow, 2015; Sarpong & Hartman, 2018).

Third, technology-related moderators play an increasingly important role for strategic foresight activities and their outcomes (Von der Gracht et al., 2015). Research shows that technology can facilitate positive results of foresight practices by making them more transparent and collaborative (Rohrbeck, Battistella, & Huizingh, 2015; Von der Gracht et al., 2015). More precisely, technology can open foresight activities up to more participants, ease communication between them, and facilitate a supportive culture for successful foresight (Rohrbeck, Battistella, & Huizingh, 2015). This suggests that the moderating effect of technology is rather indirect and influences the activity-outcome relationship of foresight by affecting structure and culture (Marinković et al., 2022). In addition to this indirect effect, technology also directly moderates the outcomes of foresight by improving the processes of foresight activities: research emphasizes that modern technology can improve the quality and efficiency of foresight activities, especially when they are data-driven (Yoon et al., 2019). Disparately, technology is not only a moderator for foresight processes but can also be the initial motivation for such practices or a (positive) outcome in itself (Marinković et al., 2022). Broadly, this can be seen in the organizing framework introduced in chapter 4.1.3. Additionally, details on technological outcomes of foresight are presented in chapter 4.3.2.

4.3. Strategic Foresight's Impact on Firm Performance

The range of strategic foresight's implications for firm performance is broad and includes external as well as internal outcomes. The differentiation of those outcomes made in the organizing framework (chapter 4.1.3) is once again shown in the following table (Table 6). The findings regarding those different categories will be displayed in detail in the following sections. This display aims to provide the basis to answer the third and final research question of this paper Q3 ("How does successful strategic foresight reflect itself in overall firm performance?").

4.3.1. Strategic Impact

One research stream in the strategic foresight field shows that successful foresight practices can improve decision-making, strategic planning as well as overall strategic agility

and flexibility (e.g., Rohrbeck, 2012; Ruff, 2015; Vecchiato, 2015). The detailed findings on such strategy-related, qualitative outcomes are presented and discussed in the paragraphs below.

Firstly, several publications emphasize the idea that strategic foresight positively impacts decision-making (e.g., Battistella & De Toni, 2011; Heger & Rohrbeck, 2012; Ringland, 2010). As explained in the introduction, understanding the implications of environmental changes to adapt decision-making is one of the theoretical motivations for organizations to employ foresight practices (Calof et al., 2018; Yoon et al., 2018). Research demonstrates that this can be achieved in practice and attribute this to strategic foresight's outside-in perspective which allows firms to identify trends and changes (before the competition) (Peter & Jarratt, 2015; Rohrbeck & Schwarz, 2013). As a result, decision failures are reduced significantly in firms with mature strategic foresight practices (Chermack, 2004). While some scholars argue that this impact is too generic and hard to quantify (Iden et al., 2017), research does support foresight's positive impact on decision-making through several qualitative studies (e.g., Gershman et al., 2016; Heger & Rohrbeck, 2012; Rohrbeck, 2012).

Secondly, findings showcase that foresight practices can improve strategic planning (e.g., Ringland, 2010; Von der Gracht & Stillings, 2013; Yoon et al., 2019). This is attributed to the fact that strategic foresight makes the future more tangible through developing and illustrating potential scenarios (Lehr, Lorenz, Willert, & Rohrbeck, 2017; Weber et al., 2015). In particular, distinct scenarios and roadmaps developed in foresight activities are believed to have a positive impact on strategic planning (Milshina & Vishnevskiy, 2018; Yoon et al., 2019). As indicated through the organizing framework (chapter 4.1.3), technological aids and process tools are moderators that can facilitate foresight's success and improve strategic planning as well as strategy development (Farrukh & Holgado, 2020; Tapinos, 2013). While researchers agree on a positive outcome here, exact effects are only observable in the long term (Iden et al., 2017; Rohrbeck, 2012).

Thirdly, the findings of scholars show that foresight can positively impact the strategic flexibility and agility of organizations. This is again connected to the outside-in perspective of foresight that allows firms to better anticipate and respond to external changes (Battistella, 2014; Peter & Jarratt, 2015). Here, several researchers point out that strategic foresight can lead to significant flexibility/agility improvements (Gershman et al., 2016; Haarhaus & Liening, 2020; Vecchiato, 2015), due to increased organizational reactiveness that results from a better environmental understanding (Battistella, 2014; Battistella & De Toni, 2011; Rohrbeck, 2012; Vecchiato & Roveda, 2010b). Studies show that this improved ability to (proactively) respond to change is connected to enhanced organizational learning that results from foresight activities (Rohrbeck, 2012). This concludes the findings on the three main strategic impacts that successful strategic foresight can have on (internal) firm performance.

Table 6: Foresight's Impact on Firm Performance Research Structure.

Research Theme	Topic	Influential Studies
Strategic Impact	I. Strategic Decision-Making	Yoon et al., 2019; Schwarz et al., 2019; Milshina & Vishnevskiy, 2018; Gershman et al., 2016; Von der Gracht & Stillings, 2013; Rohrbeck, 2012; Ringland, 2010
	II. Strategic Planning	Yoon et al., 2019; Gershman et al., 2016; Peter & Jarratt, 2015; Von der Gracht & Stillings, 2013; Rohrbeck, 2012; Ringland, 2010
	III. Strategic Agility / Flexibility	Haarhaus & Liening, 2020; Wiener et al., 2020; Gershman et al., 2016; Peter & Jarratt, 2015; Vecchiato, 2012
Organizational Impact	I. Organizational Learning, Consensus and Communication	Wiener et al., 2020; Burt & Nair, 2020; Schweitzer et al., 2019; Bootz et al., 2019; Ruff, 2015; Paliokaitė & Pačėsa, 2015; Boe-Lillegraven & Monterde, 2015; Van der Duin et al., 2014; Rohrbeck, 2012; Ringland, 2010; Costanzo, 2004
	II. Technology Innovation	Wiener et al., 2020; Schwarz et al., 2019; Ho & O'Sullivan, 2018; Gershman et al., 2016; Scheiner, Baccarella, Bessant, & Voigt, 2015; Rohrbeck, Battistella, & Huizingh, 2015; Paliokaitė & Pačėsa, 2015; Battistella, 2014; Von der Gracht & Stillings, 2013; Rohrbeck & Gemünden, 2011
	III. Portfolio Innovation	Schweitzer et al., 2019; Ruff, 2015; Vecchiato, 2012; Battistella & De Toni, 2011
Performance Impact	I. Competitiveness	Arokodare & Asikhia, 2021; Eskandari et al., 2020; Ho & O'Sullivan, 2018; Nkuda, 2017; Vecchiato, 2015; Reid & Zyglidopoulos, 2004
	II. Profitability	Arokodare & Asikhia, 2021; Rohrbeck & Kum, 2018; Boe-Lillegraven & Monterde, 2015; Rohrbeck & Schwarz, 2013; Vecchiato, 2012; Rohrbeck, 2012

4.3.2. Organizational Impact

The second cluster of research regarding foresight's impact on firm performance focuses on the organization- and innovation-related outcomes of foresight practices. Research suggests that it facilitates organizational change and influences how individuals work (together) (Rohrbeck, 2012; Paliokaitė & Pačėsa, 2015; Van der Duin et al., 2014), while those changes and the outside-in orientation of foresight can improve firms' innovation capabilities (Adegbile et al., 2017; Paliokaitė & Pačėsa, 2015). The findings are differentiated into organizational change, technological innovation, and portfolio innovation will be displayed below.

While foresight's organizational impact is often regarded as a side effect, the perceived importance of such outcomes is growing rapidly (Marinković et al., 2022). Research, for example, suggests that foresight's sensitization to environmental changes induces increased reflection and organizational renewal (Burt & Nair, 2020; Ruff, 2015; Wiener et al., 2020). Also, research shows that the collaborative tools used for foresight can improve communication and consensus within organizations (Bootz et al., 2019; Ramírez et al., 2013; Rohrbeck & Schwarz, 2013). On one hand, this is the case because foresight requires communication within an organization and stimulates discussions (Rohrbeck, 2012). On the other hand, foresight tools often integrate multiple stakeholders and open the discussion for members from different hierarchy levels which increases collaboration and consensus according to scholars (Boe-Lillegraven & Monterde, 2015; De Smedt et al., 2013; Ho & O'Sullivan, 2017). Overall, research shows that foresight can improve organizational

change, communication, and consensus which positively impacts organizational efficiency and effectiveness (Ilmola & Kuusi, 2006; Wiener et al., 2020).

Generally, studies show that strategic foresight has a positive impact on the ambidexterity of firms (Paliokaitė & Pačėsa, 2015; Sarpong, Maclean, & Davies, 2013). Focused on technological innovation, one research stream attests that early assessment of new technologies, weak signal identification, and the improved ability to create radical innovation are positive impacts of foresight practices (Gershman et al., 2016; Rohrbeck, Battistella, & Huizingh, 2015; Scheiner et al., 2015; Wiener et al., 2020). A different research stream implies that firms with foresight capability are better at strategically integrating technological innovations in their businesses due to better process understanding (Battistella, 2014; Rohrbeck, Battistella, & Huizingh, 2015; Paliokaitė & Pačėsa, 2015; Schwarz et al., 2019). Therefore, foresight can have a positive impact on the technological innovation capabilities of a firm due to an improved understanding of its processes and surroundings.

Lastly, research indicates that strategic foresight can have a positive effect on portfolio innovation which includes products, business models, and markets (Von Der Gracht, Vennemann, & Darkow, 2010). Here, research points out that successful foresight can improve organizations' capability to develop new products and fulfill customer needs through envisioning scenarios with future preferences (Açikgöz, Günsel, Kuzey, & Zaim, 2016; Ho & O'Sullivan, 2018; Schwarz et al., 2019; Un & Price, 2007; Wright et al., 2008). Further, scholars show that firms with foresight capability develop a better

market understanding and are more successful in identifying new business fields due to environmental scanning activities (Boe-Lillegraven & Monterde, 2015; Fritzsche, 2018; Rohrbeck & Gemünden, 2011). Also, research suggests that incorporating foresight in the creation and evaluation of business models can improve the result (Farrington et al., 2012; Højland & Rohrbeck, 2018; Van der Duin et al., 2014). In sum, strategic foresight can, therefore, have a significantly positive impact on an organization's portfolio innovation.

4.3.3. Performance Impact

Due to strategic foresight's qualitative nature and long-term orientation, most of the existing research focused on internal, qualitative outcomes (Boe-Lillegraven & Monterde, 2015; Vecchiato, 2012). However, recent studies attempted to show the external performance impact of foresight activities by assessing their effect on the competitiveness and profitability of firms (e.g., Rohrbeck & Kum, 2018). The findings in those two categories are displayed below.

In practice, it is very difficult to isolate the quantitative impact of foresight (Rohrbeck, 2012; Rohrbeck & Schwarz, 2013). Therefore, many studies on foresight's impact on external firm performance rather focused on non-financial competitiveness (Milshina & Vishnevskiy, 2018; Wiener et al., 2020). According to those studies, firms that apply strategic foresight perform better compared to their competition which is attributed to the strategic and organizational benefits of foresight activities that were introduced above (Marinković et al., 2022). One study, for example, suggests that strategic foresight enhances competitiveness through improved organizational efficiency and optimized offerings (Eskandari et al., 2020; Ho & O'Sullivan, 2018) while other scholars point out that the strategic agility that results from foresight practices can lead to sustainable competitive advantages (Arokodare & Asikhia, 2021; Nkuda, 2017; Vecchiato, 2015). Inversely, research suggests that a lack of foresight can lead to negative competitive outcomes (Reid & Zyglidopoulos, 2004). In conclusion, research, therefore, indicates that successful strategic foresight can improve the competitive dynamics of an organization.

Recently, a new research stream further investigated the quantitative, financial impact of strategic foresight on organizational profitability (Rohrbeck, 2012; Rohrbeck & Kum, 2018). This research indicates that strategic foresight activities can be a good investment and increase firm profitability over time (Rohrbeck, 2012). However, since outcomes are mostly observable in the long term, investments in foresight are often neglected in favor of other ventures (Iden et al., 2017; Rohrbeck, 2012). To capture those long-term effects, a longitudinal study was conducted which attests that firms with foresight capability show up to "33% higher profitability and a 200% higher market capitalization growth" than the average of compared firms (Rohrbeck & Kum, 2018). Other studies also suggest that foresight activities can lead to superior firm performance and market share growth (Arokodare & Asikhia, 2021). In these studies, researchers generally see foresight's impact on profitability as an indirect result of the

mentioned qualitative outcomes (Marinković et al., 2022). Consequently, there still seems to be a lack of evidence for the direct effects of foresight on profitability and competitiveness which needs to be addressed in future research. Still, first studies already exhibit empirically that successful foresight can improve quantitative, financial performance (Rohrbeck & Kum, 2018).

This concludes the potential impacts strategic foresight (capability) can have on firm performance. For many of those outcomes, measurement is rather difficult and the root cause for the (positive) effect is uncertain (Iden et al., 2017; Rohrbeck, 2012). Still, research clearly suggests that foresight capability can be a facilitator for successful foresight and positive implications for firm performance (e.g., Gershman et al., 2016; Heger & Rohrbeck, 2012). Nevertheless, further (empirical) research is necessary to quantify exact outcomes and make foresight's impact on firm performance more tangible. This can help practitioners in directing their efforts to certain topics in foresight practices and advance academia through more empirical evidence.

5. Discussion

The preceding chapters descriptively displayed the current state and knowledge on different topics in strategic foresight research. This chapter builds on this display and discusses the provided information to answer the paper's research questions (Q1-Q3). In doing so, this chapter aims to point out theoretical and practical implications as well as the limitations of the findings. Overall, the systematic literature review in this paper offers an updated, more extensive picture of existing research, structures the field through the organizing framework, and provides a state-of-the-art foundation for future research on foresight capability and foresight's impact on firm performance. The following paragraphs explain those contributions in detail.

5.1. Theoretical and Practical Implications

First, the quantitative review in this paper organized existing foresight research and showcased trends. Regarding the question of what the current state of strategic foresight research is (Q1), the following two insights were gathered: (1) Research on strategic foresight is becoming more relevant in the scientific discourse (increased yearly publications in higher-ranked journals) but must still develop its foundations. Many publications don't have a clear theoretical foundation (n=88) and are untransparent regarding the analyzed epistemological dimension (individual- or organization-level). (2) The organizing model developed in this paper points out that existing research mostly focused on antecedents and foundations of foresight (n=191) while findings on capability, moderators, and firm performance are still scarce (n=75) despite their practical importance. Therefore, this paper identifies those themes as relevant trajectories for future research and suggests this as an opportunity to transition foresight into management journals.

An important contribution of this quantitative part is the comprehensive overview of existing research that was created based on a sample of 243 journal-published articles. While prior research included some literature reviews (e.g., Iden et al., 2017; Singh et al., 2020), the field lacked transparency and research was never fully consolidated. Therefore, this paper extends prior work by providing the most comprehensive and most recent picture of the field to date which supports the effort of developing one unified understanding of strategic foresight. A second contribution is the developed organizing framework of strategic foresight research that displays relevant research themes and their conceptual connections. Prior research was unstructured and had not identified a clear pattern of studies (Hines, 2020; Iden et al., 2017; Rohrbeck, Battistella, & Huizingh, 2015; Snyder, 2019). Thus, the organizing framework advances the field by uniquely consolidating the most relevant research themes, displaying their connections in a clearly structured manner, and pointing out trajectories for future research. Further, this display uncovers the importance of mediators (foresight capability) and moderators for foresight's impact on firm performance which adds an important research frontier. Overall, the quantitative review creates a better understanding of the foresight field and enables more targeted future research.

Second, the qualitative review on strategic foresight capability displayed and contrasted existing conceptual models on foresight capability to understand its components and outcomes. Regarding the question of which capabilities are necessary for successful foresight (Q2), the following three findings were made: (1) Conceptual models to date do not have a unified understanding of foresight capability and differentiate between organizational or individual capabilities. While some studies suggest that individual capability can potentially result in an isomorphic organizational capability, this hypothesis must be viewed skeptically since it lacks empirical evidence. (2) Different models suggest different necessary capabilities for successful strategic foresight. Those capabilities can be grouped into processual (e.g., framing, scanning, forecasting, etc.) and contextual capabilities (organizational configuration, culture, leadership, etc.). Developing a combination seems most fitting to ensure successful foresight in practice. (3) Several models imply that the maturity of those capabilities should not be maximized but rather adapted to an organization's environment and context. Contingently, highly developed capabilities can have a negative impact on firm performance if the environmental requirements for foresight are low. Matching maturity and need is expected to result in the best outcomes.

One contribution of this qualitative review is the raised awareness regarding different epistemological dimensions of foresight capability. Prior studies often neglected this discrepancy and built on studies that had different units of analysis (e.g., Hines et al., 2017; Grim, 2009). Therefore, this paper advances foresight studies by enabling a more conscious and differentiated handling of preceding studies which can improve the quality of overall foresight research. Also, this

paper contributes to foresight studies by extensively consolidating the current knowledge on foresight capability. Prior to this, different capability models were published in isolation and not compared or contrasted with each other (e.g., Day & Schoemaker, 2005; Grim, 2009; Rohrbeck, 2010). This paper, therefore, extends prior research by uncovering similarities and differences between existing models and by categorizing necessary capabilities into processual and contextual elements. Overall, this is the first literature review that extensively showcases findings on distinct capabilities that compose foresight capability which lays the foundation for a productive discourse about foresight capability. However, the suggested capabilities and their potential impact on firm performance were derived from conceptual studies and have often not yet been empirically tested (in isolation). Therefore, while those findings already offer theoretical and practical implications, they must be verified further in future research.

Third, the qualitative review on foresight's impact on firm performance provides a comprehensive list of potential outcomes. Regarding the question of how successful foresight reflects itself in firm performance (Q3), the following two insights were gathered: (1) Successful foresight activities can have a significantly positive impact on internal and external firm performance. This positive impact manifests itself in strategic, organizational, and performance outcomes that can allow firms to gain a competitive advantage and achieve superior performance in volatile business environments. (2) Most existing studies concerning foresight's outcomes build on qualitative research designs and suggest qualitative, long-term results that are difficult to measure. Only very few articles in the paper's sample (n=4) quantify foresight's impact on firm performance and empirically assess it over a longer period. Thus, it is still difficult to determine and quantify the exact, isolated impact of foresight (capability) on firm performance.

The main contribution of this part is the extensive overview of potential qualitative and quantitative impacts of foresight on firm performance. Prior research mostly dealt with qualitative, internal outcomes and lacked a consolidation of all potential impacts (e.g., Gershman et al., 2016; Peter & Jarratt, 2015; Paliokaitė & Pačėsa, 2015; Yoon et al., 2019). Therefore, this paper extends existing research by providing a comprehensive overview that includes internal, qualitative as well as external, quantitative outcomes from foresight (capability). This enables scholars to empirically test and quantify the exact activity-outcome relationship of foresight. Exploring those topics further can advance the field by making the rather qualitative and opaque topics of foresight capability and foresight outcomes more measurable and tangible.

5.2. Limitations and Shortcomings

While the research approach and methodology for this paper were selected carefully, there are limitations that need to be considered to fully understand the paper's implications. The two main limitations are discussed in the following paragraphs to create more transparency.

First, there are limitations regarding the sample of articles used in this paper. The sample included only journal-published articles (with two exceptions) and omitted other sources like books or conference papers. Therefore, the findings presented in those other research outlets were not considered in this paper's analyses which limits the exhaustiveness of its findings. Further, the sample excluded papers published prior to the year 2000 which also limits the finding's exhaustiveness since there might be relevant articles dated earlier. Also, it cannot be guaranteed that all relevant publications were included due to the selective usage of AI-search engines and research databases as well as broadly specified search keywords. Adaptions to those aspects could potentially change the final sample and result in more refined outcomes. However, the most relevant contributions are expected to be included either way due to the reproducing nature of research which suggests that the impact of those limitations is minor.

Second, a limitation of this paper's practical implications arises from the nature of the employed research approach. More precisely, findings on foresight capability mostly build on conceptual articles (e.g., theoretical frameworks, models, etc.) that often do not offer (extensive) empirical evidence. For example, while there are studies that connect foresight capability to firm performance and empirically observe certain outcomes, it cannot fully be inferred how distinct capabilities (and overall foresight capability) influence those outcomes in isolation. Therefore, more empirical research must be done to determine which capabilities are necessary for successful foresight. Similarly, the findings regarding foresight's impact on firm performance are mostly based on qualitative studies that do not allow conclusions on the exact root of outcomes. Since the literature review in this paper only compiled and discussed this information, it does not resolve this problem by empirically verifying the findings. Therefore, the findings do not offer proven implications for practice but should rather be seen as well-founded hypotheses that require verification. Important research trajectories, therefore, are to measure and quantify the outcomes of foresight capability on firm performance as well as the influence of moderators on this relationship. This paper's findings can be used as the foundation for that.

5.3. Evaluation of Methodology and AI Search Engines

The paper used the AI-based search engines "Iris.ai" and "Semantic Scholar" as the primary sources for data gathering and cross-checked the identified articles with the traditional databases Elsevier, JSTOR, and SAGE Journals. This methodology was not only employed to utilize the potential upsides of modern AI engines but also to assess and evaluate the current maturity of two very promising examples. The second objective was pursued by comparing the articles identified by the AI engines to the mentioned databases which are considered very exhaustive (Iden et al., 2017; Marinković et al., 2022). This comparison was done both for the full sample and for the 20 most frequently cited articles according to Dimensions AI (App. C).

Overall, this comparison draws the conclusion that AI engines can be a good addition to existing tools but lack comprehensiveness when used in isolation. While Iris.ai develops visual representations of existing literature that can be very helpful at the start of a research project (see Appendix C), the engine only identified 98 out of the 243 articles relevant for the final sample (40%) including 18 out of the 20 most frequently cited articles (90%). Therefore, this engine alone does not yet seem to be mature enough to enable a complete, extensive research project. Semantic Scholar, on the other hand, covered 159 articles of the full sample (65%) and 19 of the most frequently cited articles (95%) which suggests significantly higher comprehensiveness. Nevertheless, this engine's database does still omit around a third of relevant articles and did not display clear advantages compared to the traditional databases used for cross-checking.

Therefore, the maturity of AI-based search engines as a methodological innovation for literature reviews is currently deemed too low for independent usage. While they do provide some of the advertised benefits, they are still far from exhaustive which can significantly decrease the output quality. If a literature review aims to provide a full, comprehensive overview of a research field, this would be a particularly severe problem. Building on the intensive usage of those engines for this paper, the two core recommendations are (1) to use them only in combination with other, more established engines and (2) to utilize them for specific objectives rather than full studies. For example, the visual "explore maps" created by Iris.ai can be very helpful at the beginning of a study but are insufficient for an extensive data gathering process.

6. Conclusion

The systematic literature review on strategic foresight conducted in this thesis aimed to structure the developing field and build a theoretical basis for future research and practice. This was done through a quantitative display of descriptive trends and a comprehensive organizing framework of existing research as well as qualitative, narrative syntheses of the current knowledge on strategic foresight capability and its impact on firm performance. By answering the three research questions of this paper, it contributes to the effort of advancing the foresight field by enabling more targeted future research and accelerating theoretical progress.

The review covered 243 journal-published articles on strategic foresight between 2000 and August 2022 which is the most extensive and most recent display of research to date. By analyzing those articles, the paper identifies that the field still lacks clear theoretical foundations, mixes different epistemological dimensions (individual and organizational foresight), and builds mostly on explorative case studies or conceptual frameworks that do not work toward a clear, shared objective. Themes in foresight research were identified and used to develop an organizing framework that consists of antecedents, capability, organizational foundations, individual micro-foundations, moderators, and outcomes of foresight. The model points out the connections between the

themes which can be utilized to structure scholars' efforts to collaboratively advance the field. Through this, a unified scientific discourse on strategic foresight can be started which increases the maturity of the field and leads to tenable practical implications.

Also, the review compiles and contrasts existing knowledge on necessary capabilities to ensure successful foresight activities that can grant firms a competitive advantage. Here, the paper finds that distinct processual (e.g., framing, scanning, forecasting, etc.) and contextual (e.g., organizational configuration, culture, leadership, etc.) capabilities should be developed in accordance with an organization's faced environment to ensure success. Since those suggested capabilities build on the assumptions of conceptual frameworks, the paper proposes that those assumptions should be tested empirically through future research. This is also the case with existing research on foresight's impact on firm performance since those findings are often (arbitrarily) derived and aggregated from case studies but not verified and discussed on an overarching scale. Nevertheless, the paper clearly identifies potential positive impacts of strategic foresight on firm performance which manifest in strategic (decision-making, planning, and flexibility), organizational (communication, consensus, change, and innovation), and performance outcomes (competitiveness and profitability) in practice. This supports the underlying hypothesis that strategic foresight practices can provide firms with a competitive advantage by reducing the uncertainty that complex, volatile business environments put upon them.

While there are limitations that arise from the methodology of this paper, it does provide a comprehensive picture of existing research with its trends and gaps. This can guide future research and support practitioners in discussing and implementing foresight. In particular, it points out the following two broad trajectories: (1) Empirical testing of the exact (quantitative) outcomes of foresight practices with all its facets. More precisely, it is still unclear which effects result directly from foresight capabilities and which outcomes are rather indirect results from organizational changes that enable foresight. Also, the impact of moderators has not yet been assessed in isolation which reduces the significance of practical implications. (2) Conceptual and empirical research on foresight capability is another frontier. This paper only identified 9 articles in the sample that primarily focused on this concept and, therefore, built on a very limited foundation even though understanding the capabilities necessary to enable success is highly relevant for organizations that engage in strategic foresight activities. Here, more research must be done to build a unified understanding of foresight capability's components and their empirical foundation. Future research should practically identify and validate necessary capabilities and try to quantify effects that result from overarching foresight capability.

Overall, this paper offers the foundation to tackle those research frontiers and provides indicative practical implications. The mentioned influential studies (e.g., in Table 5 and Table 6) can be used by scholars to build on others' contributions and work toward a combined objective. Through this, future research can be more structured and collaboratively advance the still developing strategic foresight field. This will support the effort of integrating strategic foresight research into discussions in respected management journals and improve research and practice.

References

Açikgöz, A., Günsel, A., Kuzey, C., & Zaim, H. (2016). Team foresight in new product development projects. *Group Decision and Negotiation*, *25*(2), 289.

Adegbile, A., Sarpong, D., & Meissner, D. (2017). Strategic foresight for innovation management: A review and research agenda. *International Journal of Innovation and Technology Management*, *14*(04), 1750019.

Ahlqvist, T., & Kohl, J. (2016). Constructing and mobilising futures knowledge in an organisation: foresight as a catalyst of dynamic strategic practice. *Technology Analysis & Strategic Management*, *28*(10), 1138–1151.

Aichouni, M., Touahmia, M., Kolsi, L., Alghamdi, A. S., & Al-Homaid, T. (2021). Foresight readiness assessment for saudi organizations. *Journal of Futures Studies*, *25*(3), 49–64.

Amsteus, M. (2008). Managerial foresight: concept and measurement. *foresight*, *10*(1), 53–66.

Arokodare, M. A., & Asikhia, O. (2021). Strategic agility: Achieving superior organizational performance through strategic fore-sight. *International Journal of Research in Finance and Management*, *4*(1).

Arokodare, M. A., Makinde, G. O., & Fakunmoju, S. K. (2020). Strategic Agility and Competitive Advantage of Oil and Gas Marketing Companies: The Moderating Effect of Information Technology Capability and Strategic Foresight. *International Journal of Advanced Research*, *8*(8), 1393–1406.

Bailey, M. D. (2006). The meanings of magic. *Magic, Ritual, and Witchcraft*, *1*(1), 1–23.

Ballandonne, M. (2020). The history of futures studies: A note on gilfillan's early work. *Technological Forecasting and Social Change*, *157*, 119983.

Battistella, C. (2014). The organisation of corporate foresight: A multiple case study in the telecommunication industry. *Technological Forecasting and Social Change*, *87*, 60–79.

Battistella, C., & De Toni, A. F. (2011). A methodology of technological foresight: A proposal and field study. *Technological Forecasting and Social Change*, *78*(6), 1029–1048.

Bennett, N., & Lemoine, G. J. (2014). What a difference a word makes: Understanding threats to performance in a vuca world. *Business horizons*, *57*(3), 311–317.

Berger, G., de Bourbon Busset, J., & Massé, P. (2007). *De la prospective: Textes fondamentaux de la prospective française, 1955-1966*. Editions L'Harmattan.

Bezold, C. (2010). Lessons from using scenarios for strategic foresight. *Technological forecasting and social change*, *77*(9), 1513–1518.

Boe-Lillegraven, S., & Monterde, S. (2015). Exploring the cognitive value of technology foresight: The case of the cisco technology radar. *Technological Forecasting and Social Change*, *101*, 62–82.

Bootz, J.-P. (2010). Strategic foresight and organizational learning: A survey and critical analysis. *Technological forecasting and social change*, *77*(9), 1588–1594.

Bootz, J.-P., Monti, R., Durance, P., Pacini, V., & Chapuy, P. (2019). The links between french school of foresight and organizational learning: An assessment of developments in the last ten years. *Technological Forecasting and Social Change*, *140*, 92–104.

Burns, A. (2021). Foundation professor of foresight: Richard slaughter's scholarly book contributions to futures studies and strategic foresight. *Futures*, *132*, 102787.

Burt, G., & Nair, A. K. (2020). Rigidities of imagination in scenario planning: Strategic foresight through 'unlearning'. *Technological Forecasting and Social Change*, *153*, 119927.

Calof, J., Arcos, R., & Sewdass, N. (2018). Competitive intelligence practices of european firms. *Technology Analysis & Strategic Management*, *30*(6), 658–671.

Chermack, T. J. (2004). Improving decision-making with scenario planning. *Futures*, *36*(3), 295–309.

Costanzo, L. A. (2004). Strategic foresight in a high-speed environment. *Futures*, *36*(2), 219–235.

Daheim, C., & Uerz, G. (2008). Corporate foresight in europe: from trend based logics to open foresight. *Technology Analysis & Strategic Management*, *20*(3), 321–336.

Darkow, I.-L. (2015). The involvement of middle management in strategy development—development and implementation of a foresight-based approach. *Technological Forecasting and Social Change, 101*, 10–24.

Day, G. S., & Schoemaker, P. J. (2005). Scanning the periphery. *Harvard business review*, *83*(11), 135.

De Smedt, P., Borch, K., & Fuller, T. (2013). Future scenarios to inspire innovation. *Technological forecasting and social change*, *80*(3), 432–443.

Djuricic, K., & Bootz, J.-P. (2019). Effectuation and foresight–an exploratory study of the implicit links between the two concepts. *Technological Forecasting and Social Change*, *140*, 115–128.

Dufva, M., & Ahlqvist, T. (2015). Elements in the construction of future-orientation: A systems view of foresight. *Futures*, *73*, 112–125.

Eskandari, F., Mohammadi, E., & Rahimi, H. (2020). The effect of strategic foresight on competitiveness, with the mediating role of strategic learning (case study: Private banks of kermanshah city). *Technium Soc. Sci. J.*, *11*, 276.

Extance, A. (2018). How ai technology can tame the scientific literature. *Nature*, *561*(7722), 273–275.

Farrington, T., Henson, K., & Crews, C. (2012). Research foresights: The use of strategic foresight methods for ideation and portfolio management. *Research-Technology Management*, *55*(2), 26–33.

Farrukh, C., & Holgado, M. (2020). Integrating sustainable value thinking into technology forecasting: A configurable toolset for early stage technology assessment. *Technological Forecasting and Social Change*, *158*, 120171.

Fritzsche, A. (2018). Corporate foresight in open laboratories–a translational approach. *Technology Analysis & Strategic Management*, *30*(6), 646–657.

Gattringer, R., & Wiener, M. (2020). Key factors in the start-up phase of collaborative foresight. *Technological Forecasting and Social Change*, *153*, 119931.

Gattringer, R., Wiener, M., & Strehl, F. (2017). The challenge of partner selection in collaborative foresight projects. *Technological Forecasting and Social Change*, *120*, 298–310.

Gershman, M., Bredikhin, S., & Vishnevskiy, K. (2016). The role of corporate foresight and technology roadmapping in companies' innovation development: The case of russian state-owned enterprises. *Technological Forecasting and Social Change*, *110*, 187–195.

Ghayoor, H., Rastegari, H., & Hosseini, S. H. (2020). Designing and developing the strategic foresight capabilities of medical universities in the accidents and crises of the country with emphasis on human resource agility. *International Journal of Logistics Systems and Management*, *36*(1), 124–137.

Gibson, E., Dime, T., Garces, E., & Dabich, M. (2018). Bibliometric analysis as a tool for identifying common and emerging methods of technological foresight foresight. *V*, *12*, 6–24.

Godet, M. (2000). The art of scenarios and strategic planning: tools and pitfalls. *Technological forecasting and social change*, *65*(1), 3–22.

Gordon, A. V., Ramic, M., Rohrbeck, R., & Spaniol, M. J. (2020). 50 years of corporate and organizational foresight: Looking back and going forward. *Technological Forecasting and Social Change*, *154*, 119966.

Greenblott, J. M., O'Farrell, T., Olson, R., & Burchard, B. (2019). Strategic foresight in the federal government: a survey of methods, resources, and institutional arrangements. *World futures review*, *11*(3), 245–266.

Grim, T. (2009). Foresight maturity model (fmm): Achieving best practices in the foresight field. *Journal of Futures Studies*, *13*(4), 69–80.

Haarhaus, T., & Liening, A. (2020). Building dynamic capabilities to cope with environmental uncertainty: The role of strategic foresight. *Technological Forecasting and Social Change*, *155*, 120033.

Hamel, S., Ims, R. A., & Yoccoz, N. (2022). Challenges and opportunities when implementing strategic foresight: lessons learned when engaging stakeholders in climate-ecological research. *Climate Research*, *86*, 29–35.

Heger, T., & Boman, M. (2015). Networked foresight—the case of eit ict labs. *Technological Forecasting and Social Change*, *101*, 147–164.

Heger, T., & Rohrbeck, R. (2012). Strategic foresight for collaborative exploration of new business fields. *Technological Forecasting and Social Change*, *79*(5), 819–831.

Hines, A. (2020). When did it start? origin of the foresight field. *World Futures Review*, *12*(1), 4–11.

Hines, A., Gary, J., Daheim, C., & van Der Laan, L. (2017). Building foresight capacity: toward a foresight competency model. *World Futures Review*, *9*(3), 123–141.

Hines, A., & Gold, J. (2015). An organizational futurist role for integrating foresight into corporations. *Technological Forecasting and Social Change*, *101*, 99–111.

Ho, J.-Y., & O'Sullivan, E. (2017). Strategic standardisation of smart systems: A roadmapping process in support of innovation. *Technological Forecasting and Social Change*, *115*, 301–312.

Ho, J.-Y., & O'Sullivan, E. (2018). Standardisation framework to enable complex technological innovations: The case of photovoltaic technology. *Journal of Engineering and Technology Management*, *50*, 2–23.

Hobday, A. J., Boschetti, F., Moeseneder, C., Stephenson, R. L., Bessey, C., Bulman, C. M., … others (2020). Quantitative foresighting as a means of improving anticipatory scientific capacity and strategic planning. *One Earth*, *3*(5), 631–644.

Højland, J., & Rohrbeck, R. (2018). The role of corporate foresight in exploring new markets–evidence from 3 case studies in the bop markets. *Technology Analysis & Strategic Management*, *30*(6), 734–746.

Iden, J., Methlie, L. B., & Christensen, G. E. (2017). The nature of strategic foresight research: A systematic literature review. *Technological Forecasting and Social Change*, *116*, 87–97.

Idoko, O., & MacKay, R. B. (2021). The performativity of strategic foresight tools: Horizon scanning as an activation device in strategy formation within a uk financial institution. *Technological Forecasting and Social Change*, *162*, 120389.

Ilmola, L., & Kuusi, O. (2006). Filters of weak signals hinder foresight: Monitoring weak signals efficiently in corporate decision-making. *Futures*, *38*(8), 908–924.

Iris.ai. (2022). *Literature review tools.* (Retrieved from: https://iris.ai/features/ (06.01.2022))

Klos, C., & Spieth, P. (2021). Ready, steady, digital?! how foresight activities do (not) affect individual technological frames for managerial sensemaking. *Technological Forecasting and Social Change*, *163*, 120428.

Lehr, T., Lorenz, U., Willert, M., & Rohrbeck, R. (2017). Scenario-based strategizing: Advancing the applicability in strategists' teams. *Technological Forecasting and Social Change*, *124*, 214–224.

Li, A., & Sullivan, B. N. (2022). Blind to the future: Exploring the contingent effect of managerial hubris on strategic foresight. *Strategic Organization*, *20*(3), 565–599.

Luzinski, C. (2014). Identifying leadership competencies of the future: Introducing the use of strategic foresight. *Nurse Leader*, *12*(4), 37–47.

Maertins, A. (2016). From the perspective of capability: Identifying six roles for a successful strategic foresight process. *Strategic Change*, *25*(3), 223–237.

Major, E., & Cordey-Hayes, M. (2000). Engaging the business support network to give smes the benefit of foresight. *Technovation*, *20*(11), 589–602.

Marinković, M., Al-Tabbaa, O., Khan, Z., & Wu, J. (2022). Corporate foresight: A systematic literature review and future research trajectories. *Journal of Business Research*, *144*, 289–311.

Martin, B. R. (2010). The origins of the concept of 'foresight'in science and technology: An insider's perspective. *Technological Forecasting and Social Change*, *77*(9), 1438–1447.

Mastio, E., & Dovey, K. (2021). Contextual insight as an antecedent to strategic foresight. *Futures*, *128*, 102715.

Miller, R. (2018). Sensing and making-sense of futures literacy: towards a futures literacy framework (flf). In *Transforming the future* (pp. 15–50). Routledge.

Miller, R., & Sandford, R. (2019). Futures literacy: The capacity to diversify conscious human anticipation. *Handbook of anticipation*, 73–91.

Milshina, Y., & Vishnevskiy, K. (2018). Potentials of collaborative foresight for SMEs. *Technology Analysis & Strategic Management*, *30*(6), 701–717.

Moore, J. (2018). Hands-on or heads-up? strategic foresight as the heart of the board's work. *Board Leadership*, *2018*(159), 7–8.

Mühlroth, C., & Grottke, M. (2018). A systematic literature review of mining weak signals and trends for corporate foresight. *Journal of Business Economics*, *88*(5), 643–687.

Nkuda, M. O. (2017). Strategic agility and competitive advantage: Exploration of the ontological, epistemological and theoretical underpinnings. *British Journal of Economics, Management & Trade*, *16*(1), 1–13.

Nugroho, Y., & Saritas, O. (2009). Incorporating network perspectives in foresight: A methodological proposal. *Foresight*.

Orlikowski, W. J., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information systems research*, *2*(1), 1–28.

Paliokaitė, A., & Pačėsa, N. (2015). The relationship between organisational foresight and organisational ambidexterity. *Technological Forecasting and Social Change*, *101*, 165–181.

Paliokaitė, A., Pačėsa, N., & Sarpong, D. (2014). Conceptualizing strategic foresight: An integrated framework. *Strategic change*, *23*(3-4), 161–169.

Peter, M. K., & Jarratt, D. G. (2015). The practice of foresight in long-term planning. *Technological Forecasting and Social Change*, *101*, 49–61.

Peterson, A., & Wu, A. (2021). Entrepreneurial learning and strategic foresight. *Strategic Management Journal*, *42*(13), 2357–2388.

Piirainen, K. A., & Gonzalez, R. A. (2015). Theory of and within foresight—"what does a theory of foresight even mean?". *Technological Forecasting and Social Change*, *96*, 191–201.

Pulsiri, N., & Vatananan-Thesenvitz, R. (2021). Triangle relationship: a review of dynamic capabilities, strategic foresight and organizational learning. *International Journal of Business Environment*, *5*(3), 1–18.

Ramírez, R., Österman, R., & Grönquist, D. (2013). Scenarios and early warnings as dynamic capabilities to frame managerial attention. *Technological Forecasting and Social Change*, *80*(4), 825–838.

Rasmussen, B., Andersen, P. D., & Borch, K. (2010). Managing transdisciplinarity in strategic foresight. *Creativity and Innovation Management*, *19*(1), 37–46.

Reid, D. M., & Zyglidopoulos, S. C. (2004). Causes and consequences of the lack of strategic foresight in the decisions of multinational enterprises to enter china. *Futures*, *36*(2), 237–252.

Reimers-Hild, C. (2018). Strategic foresight, leadership, and the future of rural healthcare staffing in the united states. *Jaapa*, *31*(5), 44.

Rhisiart, M., Miller, R., & Brooks, S. (2015). Learning to use the future: developing foresight capabilities through scenario processes. *Technological Forecasting and Social Change*, *101*, 124–133.

Rincón, G. B., & Díaz-Domínguez, A. (2022). Assessing futures literacy as an academic competence for the deployment of foresight competencies. *Futures*, *135*, 102872.

Ringland, G. (2010). The role of scenarios in strategic foresight. *Technological Forecasting and Social Change*, *77*(9), 1493–1498.

Rohrbeck, R. (2010). *Corporate foresight: towards a maturity model for the future orientation of a firm*. Springer Science & Business Media.

Rohrbeck, R. (2012). Exploring value creation from corporate-foresight activities. *Futures*, *44*(5), 440–452.

Rohrbeck, R., Battistella, C., & Huizingh, E. (2015). Corporate foresight: An emerging field with a rich tradition. *Technological Forecasting and Social Change*, *101*, 1–9.

Rohrbeck, R., & Gemünden, H. G. (2011). Corporate foresight: Its three roles in enhancing the innovation capacity of a firm. *Technological forecasting and social change*, *78*(2), 231–243.

Rohrbeck, R., & Kum, M. E. (2018). Corporate foresight and its impact on firm performance: A longitudinal analysis. *Technological Forecasting and Social Change*, *129*, 105–116.

Rohrbeck, R., & Schwarz, J. O. (2013). The value contribution of strategic foresight: Insights from an empirical study of large european companies. *Technological Forecasting and Social Change*, *80*(8), 1593–1606.

Rohrbeck, R., Thom, N., & Arnold, H. (2015). It tools for foresight: The integrated insight and response system of deutsche telekom innovation laboratories. *Technological Forecasting and Social Change*, *97*, 115–126.

Ruff, F. (2006). Corporate foresight: integrating the future business environment into innovation and strategy. *International Journal of Technology Management*, *34*(3-4), 278–295.

Ruff, F. (2015). The advanced role of corporate foresight in innovation and strategic management—reflections on practical experiences from the automotive industry. *Technological Forecasting and Social Change*, *101*, 37–48.

Sarpong, D., & Hartman, D. (2018). Fading memories of the future: the dissipation of strategic foresight among middle managers. *Technology Analysis & Strategic Management*, *30*(6), 672–683.

Sarpong, D., & Maclean, M. (2016). Cultivating strategic foresight in practise: A relational perspective. *Journal of Business Research*, *69*(8), 2812–2820.

Sarpong, D., Maclean, M., & Alexander, E. (2013). Organizing strategic foresight: A contextual practice of 'way finding'. *Futures*, *53*, 33–41.

Sarpong, D., Maclean, M., & Davies, C. (2013). A matter of foresight: How practices enable (or impede) organizational foresightfulness. *European Management Journal*, *31*(6), 613–625.

Savioz, P., & Blum, M. (2002). Strategic forecast tool for smes: how the opportunity landscape interacts with business strategy to anticipate technological trends. *Technovation*, *22*(2), 91–100.

Scheiner, C. W., Baccarella, C. V., Bessant, J., & Voigt, K.-I. (2015). Thinking patterns and gut feeling in technology identification and evaluation. *Technological Forecasting and Social Change*, *101*, 112–123.

Schoemaker, P. J., & Tetlock, P. E. (2017). Building a more intelligent enterprise. *MIT Sloan Management Review*.

Schwarz, J. O., Ram, C., & Rohrbeck, R. (2019). Combining scenario planning and business wargaming to better anticipate future competitive dynamics. *Futures*, *105*, 133–142.

Schweitzer, N., Hofmann, R., & Meinheit, A. (2019). Strategic customer foresight: From research to strategic decision-making using the example of highly automated vehicles. *Technological Forecasting and Social Change*, *144*, 49–65.

Singh, S., Dhir, S., Das, V. M., & Sharma, A. (2020). Bibliometric overview of the technological forecasting and social change journal: Analysis from 1970 to 2018. *Technological Forecasting and Social Change*, *154*, 119963.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, *104*, 333–339.

Tapinos, E. (2013). Scenario planning at business unit level. *Futures*, *47*, 17–27.

Tapinos, E., & Pyper, N. (2018). Forward looking analysis: Investigating how individuals 'do'foresight and make sense of the future. *Technological Forecasting and Social Change*, *126*, 292–302.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, *18*(7), 509–533.

Un, S., & Price, N. (2007). Bridging the gap between technological possibilities and people:: Involving people in the early phases of technology development. *Technological Forecasting and Social Change*, *74*(9), 1758–1772.

Van der Duin, P., Heger, T., & Schlesinger, M. D. (2014). Toward networked foresight? exploring the use of futures research in innovation networks. *Futures*, *59*, 62–78.

van der Laan, L. (2021). Disentangling strategic foresight? a critical analysis of the term building on the pioneering work of richard slaughter. *Futures*, *132*, 102782.

van der Laan, L., & Erwee, R. (2012). Foresight styles assessment: a valid and reliable measure of dimensions of foresight competence? *Foresight*.

Vecchiato, R. (2012). Strategic foresight: matching environmental uncertainty. *Technology Analysis & Strategic Management*, *24*(8), 783–796.

Vecchiato, R. (2015). Creating value through foresight: First mover advantages and strategic agility. *Technological Forecasting and Social Change*, *101*, 25–36.

Vecchiato, R. (2020). Analogical reasoning, cognition, and the response to technological change: lessons from mobile communication. *Research Policy*, *49*(5), 103958.

Vecchiato, R., & Roveda, C. (2010a). Foresight in corporate organisations. *Technology Analysis & Strategic Management*, *22*(1), 99–112.

Vecchiato, R., & Roveda, C. (2010b). Strategic foresight in corporate organizations: Handling the effect and response uncertainty of technology and social drivers of change. *Technological Forecasting and Social Change*, *77*(9), 1527–1539.

Von der Gracht, H. A., Bañuls, V. A., Turoff, M., Skulimowski, A. M., & Gordon, T. J. (2015). *Foresight support systems: The future role of ict for foresight* (Vol. 97). Elsevier.

Von der Gracht, H. A., & Stillings, C. (2013). An innovation-focused scenario process—a case from the materials producing industry. *Technological Forecasting and Social Change*, *80*(4), 599–610.

Von Der Gracht, H. A., Vennemann, C. R., & Darkow, I.-L. (2010). Corporate foresight and innovation management: A portfolio-approach in evaluating organizational development. *Futures*, *42*(4), 380–393.

Weber, C., Sailer, K., & Katzy, B. (2015). Real-time foresight—preparedness for dynamic networks. *Technological Forecasting and Social Change*, *101*, 299–313.

Weigand, K., Flanagan, T., Dye, K., & Jones, P. (2014). Collaborative foresight: Complementing long-horizon strategic planning. *Technological Forecasting and Social Change*, *85*, 134–152.

Wiener, M., Gattringer, R., & Strehl, F. (2018). Participation in inter-organisational collaborative open foresight a matter of culture. *Technology Analysis & Strategic Management*, *30*(6), 684–700.

Wiener, M., Gattringer, R., & Strehl, F. (2020). Collaborative open foresight-a new approach for inspiring discontinuous and sustainability-oriented innovations. *Technological Forecasting and Social Change*, *155*, 119370.

Wright, G., O'Brien, F., Meadows, M., Tapinos, E., & Pyper, N. (2020). *Scenario planning and foresight: Advancing theory and improving practice* (Vol. 159). Elsevier.

Wright, G., Van der Heijden, K., Burt, G., Bradfield, R., & Cairns, G. (2008). Scenario planning interventions in organizations: An analysis of the causes of success and failure. *Futures*, *40*(3), 218–236.

Yoon, J., Kim, Y., Vonortas, N. S., & Han, S. W. (2018). Corporate foresight and innovation: the effects of integrative capabilities and organisational learning. *Technology Analysis & Strategic Management*, *30*(6), 633–645.

Yoon, J., Kim, Y. J., Vonortas, N. S., & Han, S. W. (2019). A moderated mediation model of technology roadmapping and innovation: The roles of corporate foresight and organizational support. *Journal of Engineering and Technology Management*, *52*, 61–73.