Guest Editorial: Foresight in Strategy and Innovation Management

I. Introduction

THE field of strategic foresight develops perspectives and practices that anticipate transformational change and prepares organization to navigate them. It develops capabilities that enable decision-makers see and evaluate future situations so as to better consider alternative courses of actions and the future outcomes of their choices [1], [2]. As a research stream, strategic foresight has existed for more than 70 years [3]–[5]. During this time, evaluation of the field has documented how the use of strategic foresight to form strategy under uncertainty has enabled organizations to create superior positions in future markets or to advance societal goals [6], [7].

Over this time, strategic foresight has incorporated and used many of the theories and methods found in cognate fields, particularly in strategy and innovation. The reverse is also true as these fields have begun to adopt the frameworks of a maturing foresight field. Among these, strategy has found value exploring the relationship between organizations and their futures, particularly in the dynamic capabilities perspective which highlights the need to renew and align organizational resources when faced with external changes. From another perspective, the behavioral theory of the firm (BTF) emphasizes that to create strategies that are markedly different from the status quo, cognitive bounds need to be overcome [8]. Kaplan and Orlikowski [9] have documented that temporal work, in which strategy teams discuss the past, present, and future, is key for overcoming strategy breakdowns, that is, that strategists use the tension between the data from the past, perception of the present, and anticipation of the future to fuel a creative and forward-looking strategic discussion.

In a related vein, the innovation management literature has gained a strong momentum in opening up. Open innovation highlights the role of purposeful knowledge from the external environment [10]. The discussions around business model innovation have included the need to create an appropriate firm value over time in view of changing and future circumstances [11]. User innovation studies nurture insights toward a "need-forecasting-laboratory" [12]. Design thinking offers the opportunity to consider the needs of not only present but also potential future users by way of foresight processes such as future scenarios [13].

Authors such as Makridakis and Taleb [14] and Alvarez *et al*. [15] have observed that organizational future-thinking ubiquitously uses models that assume environments where distributions of possible future states can be known and for which probability can be known. Or, said differently, that organizations assume that we can model future uncertainties as if it were merely risk. As we look around at many industries in the early 2020s, this feels like a brittle assumption, which explains why we are witnessing renewal of research oriented to management under true (Knightian) future uncertainty and that various streams of work including and alongside strategic foresight are congregating to address this [15]. In this special issue, we aim to catalyze the integration of those conversations and facilitate stronger bridge-building between these emerging knowledge pools.

As editors of this special issue, our purpose is to recognize and foster a richer understanding of the productive overlap between strategic foresight and its strategy and innovation cognate areas to seed growing links and point to areas of potential collaboration and further research. We aspire to give the foresight field ways to bind more tightly to allied scholarly conversations and to put the future uncertainty issue in organizational theory and innovation management on a more solid footing to serve researchers and analysts across this spectrum. Aligned with Davies *et al*. [16], we see need for and benefit in "learning each other's language" to facilitate collaboration between research disciplines.

To do this, we seek to contribute specifically here in this introductory article by offering our understanding of four emerging research streams at the heart of the intersection between strategic foresight, innovation management, and strategic management and provide a model for their cross-fertilization. This model is summarized in the table, Fig. 1, and elaborated over the course of this article and in relation to the papers that make up the special issue. In Section II, we lay out the concept of forward-looking search as our key organizing principle bringing together apparently disparate conversations. In Section III, we address the organizational and strategic perspectives that relate to foresight, particularly in relation to dynamic capabilities and "great strategies." In Section IV, we turn to topics in innovation which dovetail with strategic foresight and organize these under the topics of new product development and open foresight.

II. Forward-Looking Search

We use the theory and practice of "forward-looking search" to integrate the fields of future-inquiry and future navigation that range across the strategic foresight, strategy, and innovation literature. In strategic foresight, search is a ubiquitous activity and is particularly apparent in horizon (or "environmental") scanning, whereby the organization addresses change in its external environment by way of structured search [17]. This

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TABLE I
EMERGING RESEARCH STREAMS AT THE INTERSECTION AMONG FORESIGHT, STRATEGY, AND INNOVATION MANAGEMENT

	STRATEGY		INNOVATION	
	Foresight as a Dynamic Capability	**Foresight and Great Strategies**	**Open Foresight**	**Foresight in New Product Development**
Typical unit of analysis	Organizational capability	Strategy	Knowledge transfer across firm boundaries	Process
Managerial mission	What are the capabilities that organizations can use to change and renew themselves (and their environment)	How organizations can leverage strategic foresight develop unique and distant strategies, that break away from the status quo in an industry	Inform how multiple organizations/ actors can explore and develop the future of their industry together Identification of knowledge sources Integration of knowledge	How to transform future trends into products and services through prospective problem solving and creativity
Scholarly mission	Identify the microfoundations that allow organizations to change and renew themselves	Identify the microfoundations of great strategies	Describe open foresight, identify drivers of success	Understand how foresight contributes to innovation idea genesis
School of thought (origins of the stream)	Dynamic capabilities	Behavioral strategy	Open Innovation and foresight processes	Front end of innovation
Core concepts	Resource base, processes (sensing, seizing, transforming)	Market order, cognitive representation, routines,	Knowledge flows, knowledge bases, opportunity recognition,	Opportunity recognition, decision quality, problem
		technologies, values, valuation	organizational learning	formulation
Audience	Strategic planners, business development managers, top management	Top Management	Managers in public and private domain	Innovation management scholars and practitioners
Relations to other streams	Resource-based View	Behavioral theory of the firm	Organizational search	Entrepreneurial opportunity recognition
Core papers	Scoblic (2020), Schwarz, Rohrbeck, Wach (2020)	Gavetti, Porac (2018)	Heger, Rohrbeck (2012), Heger, Boman (2015), Zeng, Koller, Jahn (2019), Schmidthuber, Wiener (2017)	Rohrbeck, Gemünden (2011), Special issue TFSC (2015), Gordon et al. (2019)

search is commonly navigated by way of subsearches in key areas, using the PESTEL (political; economic; social; technological; environmental; legislative) mnemonic, and is also understood to address both the transactional environment external to the organization, including competitor analysis, as well as the broader contextual environment in which it is located [18].

In organization studies, the concept of search is rooted in the work of Cyert and March [19] who observed that firms tend to engage in local search, for example, experimenting with alternative courses of action in the vicinity of their current actions. However, such search behavior is delimited by the bounded rationality of organizational agents, which is tied to past experience and past data, thus being limited in ability to see and act on distant opportunities [20]. Cognitive representations and routines built on past experience are what prevent more distant search [21], [22]; therefore, Gavetti [8] argues that strategists need to overcome cognitive bounds to identify distant opportunities and so determine strategies markedly different from the status quo. Gavetti and Levinthal [23] contrast backward-looking search, where action-outcome linkages are explored by experimentation, with forward-looking search, where cognition about action-outcome linkages can go beyond experimental wisdom and thus explore a larger set of alternative actions and outcomes. Such cognition is bound by the mental models of the strategist; therefore, the more cognitive bounds can be broadened, the more alternative action-outcome linkages can be explored, and the more distant and potentially more valuable courses of action that a strategist can choose from.

Eisenhardt and Bingham [24] draw on their research on successful ventures to emphasize that establishing "a broad view" will allow companies to discover new opportunities and that capturing them can be helped by organizational structures that operate at the edge of chaos; that is, organizational units that, via a lack of structure, favor the creation of new teams and new relationships which in turn aid serendipitous identification of opportunities. In some cases, this is achieved by forward search beyond the current industry. For example, in a study of the financial services firm Merrill Lynch, Gavetti and Menon [1] argue that its iconic success was enabled by a mental model that originated from outside the industry. This was the model

of the supermarket, where customers were treated equally and where all customers had access to competitive prices, which was far from the status quo in financial services at that time where the richest customers would be notified about the best investment opportunities first and also pay, relatively, the lowest fees. Backward-looking search, based on adaptation of the status quo by trial and error have, at best, slightly altered the dominant model in the industry. Forward-looking search that drew on an external analogy was capable of overcoming the cognitive bounds that then prevailed in the financial services industry. In this way, cognitive reframing enabled strategic foresight and, through it, the iconic success of the bank. This overcoming of the cognitive bounds that we know from the behavior theory of the firm can also be expected to be an ability that allows strategists to find great strategies, which we address in Section III-B.

In contrast to the assumption of the BTF, that firms are limited in their ability to adapt, the dynamic capabilities theory builds on the assumptions that firms can change through the agency of its management [25]. Dynamic capabilities theory builds on the resource-based view (RBV), which assumes a firm's resources to be the basis for its competitive advantage. Teece *et al*. [26] identify three processes of dynamic capabilities, "sensing, seizing and transforming," which go beyond individual cognition though they might build on it. Based on its foundations in horizon scanning, strategic foresight has been linked in particular to the "sensing" phase but may also prepare the ground for seizing and transforming phases [27], [28].

With regard to innovation, it is understood that experience-based search frequently leads to incremental innovation, while forward-looking search opens the search space for new, potentially more, distant opportunities which increase chances of identifying more radical innovations [23]. Accordingly, and in regard to foresight, a broad scan and search process is likely to anticipate trends and new knowledge early, which in turn can either indirectly or directly influence innovation. The indirect way forward is by discovering new customer needs and value migrating practices that, after transforming needs into solution ideas, form the base for new product development. The direct way would be the identification of new solutions and products that directly stimulate innovations [29].

Investments in innovation have also been documented to be a common response to "problemistic search" which can be triggered by performance below expectation; that is, recognition of performance below aspiration leads to a process of search to discover a solution to the problem, resulting in behavioral change to restore performance [30], [31]. In a similar vein, it has been shown that top-management attention to potential opportunities from environmental change can be a powerful driver of innovation within and beyond the firm boundaries [32]. This also gives rise to the expectation that external knowledge search can be linked to both forward-looking search and strategic foresight [33].

III. Foresight, Strategy, and Organization Studies

Strategic foresight stems from the idea that the elements from which the future will be constructed, and their interrelationships, can be studied—which will allow discovery of alternative development paths [6], [34], [35]. It, in part, addresses environments governed by Knightian uncertainty, where past models of success can be applied only to a limited extent. Such situations necessitate decisions that allow to break away from path dependency and past experience [36]. Thus, this goes beyond prior or analogous thinking and toward forming knowledge resources and leveraging creativity in connecting elements that will shape the future, which, today, exist only in their potentiality [35], [37], understanding also that shaping ability exists only in part or as circumstantial influence [38]. Strategic foresight is needed when the level of predeterminism, that is, elements of the environment that are "given," becomes insufficient to make reliable forecasts [39]. Applying strategic foresight is thus an answer to the challenge of taking decisions and managing organizations under conditions of external uncertainty that cannot be reduced to risk or significantly influenced.

Research that links foresight to strategic and organizational outcomes dates back to the 1960s [5], [40]. Iden *et al*. [41] discuss 59 articles that are positioned at the intersection of strategic foresight and strategy and among these dynamic capabilities theory features prominently. More recently, authors have called for the quest to find the origins of great strategies, i.e., strategies that are markedly different from the existing strategies in an industry and that, through superior features, come to dominate the industry [42]. We see these two research streams "Foresight as a Dynamic Capability" and "Foresight for Great Strategies" (with a behavioral theory foundation) as promising and discuss each in the next section.

A. Foresight as a Dynamic Capability

The scholarly investigation of dynamic capabilities is found on the RBV which postulates that competitive advantages of firms are built on strategic resources, for example, financial strength, superior assets, or human resources. Teece *et al*. [26] introduced a dynamic view to the theory of the RBV, proposing adapting to environmental changes as a similar strategic capacity, and coined the term dynamic capability to describe specific competences that allow firms to successfully address changing environment. In recent years, a growing community of scholars have further advocated for strategic foresight to be considered as a firm-specific competence, one which is particularly useful in fast-changing and complex environments [43]–[45]. Day and Schoemaker [46] have shown via two case studies how active sensing of trends led to seizing of opportunities and the transformation of the resource portfolio that created a competitive advantage. Schwarz *et al*. [27] use a cross-sectional study to establish that strategic foresight residing in organizational routines and leadership practices are predictors of successful exercising dynamic capabilities. Fergnani [47] integrates different models of strategic foresight to develop a model that can be used for theory testing.

While none of our papers in this special issue invoke dynamic capabilities theory specifically, the contribution from Meyer *et al*. [A1] provides insights on resources that firms use to build future preparedness. The authors investigate a broad

spectrum of variables that could constitute future preparedness investments and, through a factor analysis, identify three preparedness dimensions: preparedness toward global challenges; preparedness through organizational resources and capabilities; and product preparedness. They find that how and by what means an organization prepares for the future depends on firm size and industry. While their study is explorative in nature, they confirm previous findings that large firms tend to have more comprehensive future preparedness than small firms. Their study also provides interesting insights into factors that have not been investigated in previous studies and could be employed in future research.

B. Foresight and Great Strategies

While dynamic capabilities theory is rooted in the role of human agency in shaping organizations and their resources to create competitive advantages in changed environments, BTF has a contrasting starting point. BTF is rooted in the concept of bounded rationality of managers—which prevents them from engaging in forward-looking search and from identifying strategies that are distant or markedly different, from the status quo [19]. Using an NK simulation model, Gavetti and Levinthal [23] argue that in order to find more distant strategies, managers need to adopt different representations. In a case study work, Tripsas and Gavetti [48] have documented the importance of cognitive representations to direct search processes, which lead to the view that agency-driven theories need to be complemented with evolutionary theories (BTF) to create a model of organizational foresight. They define strategic foresight as "the ability of a strategist to identify a superior course of action, *especially one that is markedly different from the status quo*, and forsee its consequences" [1]. In the same article, the authors propose analogous thinking as the main method to develop strategic foresight possibly importing successful strategies or models from other industries; but Scoblic [28] does not agree that analogous reasoning alone is enough and argues that strategic foresight can help firms also to learn from the future by inspiring experiences that reduce biases and make managerial judgment more adaptive and responsive to environmental change. In a similar vein, the special issue in the *Strategy Science* journal investigates the sources of "Great Strategies" more broadly [42]. Such strategies are those of, for example, Apple, Starbucks, Airbnb, Dropbox, and Wal-Mart which all have broken away from the industry status quo and installed new dominant solutions in an industry, providing superior returns.

Further in that special issue, Brandenburger [49] emphasizes that developing Great Strategies is always a task build on creativity, where 4Cs, Contrast, Combination, Constraint, and Context, work as prompts to find new candidates for Great Strategies. Burt and Soda [50] draw from social network analysis to point at the importance of social factors in connecting new knowledge and practices that are commodity in one cluster to a new cluster where they are highly valuable. Similarly, but on the organizational-level, de Figueiredo and Silverman [51] find interfirm relational contracts can permit firms to collaborate to create difficult-to-imitate strategies.

In our special issue, Andresen, Schulte, and Koller [A2] propose that as strategic foresight is increasingly seen as a capability that rests on multiple actors from within and outside the focal firm, it would be beneficial to draw on additional theoretical frames, and they propose a combination of practice and emergence theory. They develop a model that explains how strategic foresight can be conceptualized as a process that draws on local emergence, building on, for example, observations of change from lower level agents and which uses a foresight space to create global emergence, i.e., the adoption of the new representations by the organization. It is an interesting starting point for future research that would investigate how the new representations, which open new strategy alternatives and new cognitive frames for anticipating future outcomes, are developed in practice. This article, thus, contributes a new theoretical frame to investigate the complex process of building strategic foresight in large organizations and, in a wider context, how local actors may contribute to the creation of new representations that could lead to firms adopting more distant strategies.

In the paper from Dal Borgo and Sasia [A3], the authors report and reflect on the usage of scenario planning to promote an ethical culture in organizations. They analyze an intervention process and, with an unusual application field, shed light on the interesting social process underpinning successful scenario planning exercises. Many classical scenario planning applications call on the craftsmanship of scenario planning facilitators to form scenarios tangible, insightful and impactful enough to influence decision making. The French "La Prospective" School favored directly involving decision makers even if it would be at the expense of weakening foresight method consistency or sophistication [6]. The paper of Dal Borgo and Sasia makes an important contribution by drawing our attention to the importance of combining the intellectual journey (done by trained scenario experts) with the social and emotional engagement which requires effective integrating decision makers in the scenario planning process [52].

The paper of Ketonen-Oksi [A4] provides an equally detailed and insightful perspective on practice. It documents an action research perspective on a process to advance the future orientation and build strategic foresight routines in a small enterprise. The author documents the six steps of the process, which combines development with routine execution elements. What might be judged as unusual in large organization, that is, not to develop the entire process before using it but instead to combine process development with process usage, seems to be an important factor for future-engagement success in small- and medium-sized enterprises. Another interesting observation, in line with Dal Borgo and Sasia's paper is that "the most effective way to create novel insights about the future is to collect and make sense of the data through dialogue" and, further, "the key to developing organizational futures orientation lies in the diversity of thinking and cannot therefore be done in silos." This highlights the importance of involving various actors across the organization as well as inviting external agents into a process which could be called collaborative and explorative sense-making, built on a variety of inter-actor dynamics and participation [53].

IV. Foresight and Innovation

Innovation management is considered a field of its own, one which has grown in importance and popularity and which attracts scholars from different disciplines including economics, psychology, sociology, and management [54]. Key ideas and a central understanding of the field date at least back to Schumpeter (1934) who defines innovation as "combining (of) materials and forces differently" [59, p. 65]. Even today, innovation is understood as a recombination activity, e.g., "creation of new knowledge based on existing knowledge" [56], [57].

The field is oriented to both an internal and external perspective. With reference to the internal environment, innovation management deals with topics such as new product development, dynamics of knowledge creation, innovation performance, and capability development. Thus, a strong perspective exists in regard to innovation planning and diffusion and the management of the innovation process, including creativity and design approaches. The external environment considers topics such as industrial dynamics, emergence of dominant designs, market structure, opportunity exploration, and technological discontinuities, among others. Accordingly, the external perspective has a strong focus on organizational learning and change. This can also be seen in current "hot topics" in innovation, such as open innovation (for reviews, see, e.g., [58] and [59]), innovation ecosystems (for reviews, see, e.g., [60] and [61]), and external knowledge search for innovation (for reviews, see, e.g., [33] and [62]).

Looking from a research stream perspective, innovation research focuses increasingly on management, and there exists a strong link to the field of strategic management, as also evident in the above topics and the journals in which the research is published [54]. If strategic management concentrates on explaining firm heterogeneity and differences in performance, innovations represent a key factor (sometimes referred to as outcome or antecedent) in this and one of the top indicators of future performance. Innovation is understood to offer potential for creating competitive advantage, customer satisfaction, and value creation and, thus, contributes to corporate renewal and business model innovation [63], [64].

The link between innovation studies and foresight is also not new [65]. Scenarios together with roadmaps have been embraced by innovation management and corporate foresight has been used to enhance the innovation capacity of a firm [29], [66]. More generally, von der Gracht *et al*. [67] have suggested that corporate foresight can help innovation studies by drawing on comprehensive insights in future trajectories of the organizational environment in two ways: first, before idea generation, in leveraging environmental insights to inspire ideation; second, after idea establishment, by assessing commercial and technological viability to inform the further innovation and commercialization process. They conclude that foresight helps firms cope with uncertainty and save resource in the development of nonpromising ideas. Adegbile *et al*. [68] provide a review of strategic foresight and its influence on innovation. They conclude that foresight does not result directly in innovation but influences it by shaping and giving form to innovation management tools, which cumulatively increase innovation performance. Notably, they identify only 258 academic publications between 1990 and 2014; thus, roughly less than one paper per month on innovation and foresight [68]. This suggests that much still needs to be done.

A. Foresight in New Product Development

In the next sections, we highlight conversations that are bridging insights across the foresight and innovation fields. Both in research and in practice, process models such as the so-called "stage-gate model" or the design-thinking process are an important component of innovation management. Cooper and Edgett [69] developed a process that was intended to counteract common problems in product development, such as exceeding deadlines and budgets. Their approach was to divide the product development process into work phases with clearly defined goals (called stages). At the end of each "stage" is a review of the project ("gate") by an interdisciplinary team with access to resources, which decides whether to continue or stop the project.

The stage-gate process is a significant input variable for foresight because it provides information about the current direction of a company's development activities. Depending on how long a company's development cycles are, it also provides information about the average development duration of projects. This is an important indicator for answering the question of how quickly a company is able to react to market changes. It also represents the company's development pipeline; if this is already full, it is difficult to take on new, future-oriented projects, which can be an indication of necessary cooperation with partners in the sense of open innovation.

Design-thinking can be understood as a component of the front end of stage-gate innovation; a nonlinear, iterative process that teams use to better understand user needs as a basis for stimulating innovations to prototype and test. Razzouk and Shute [70] have suggested the process most useful to address problems that are ill-defined or unknown. The further connection with foresight is that design thinking offers the opportunity to consider the needs of not only present but also potential future users by way of foresight processes such as future scenarios. In this way, customer latent needs and aspirations for future products and services can be anticipated and incorporated into innovation concepts. Gordon *et al*. [13] have established a framework which integrates the stages of design thinking and those of strategic foresight into one integrated five-step model.

Prior literature has called to leverage foresights methods to integrate "insights into their front end of innovation and thus increase the likelihood of discovering interesting opportunities" [71], while Mühlroth and Grottke [76] address, in our special issue, the question of which data sources to exploit at which stage of the technological lifecycle. They also address the stages in new product development, including the importance of management tools to standardize internal processes and build up capabilities, and show the potential of data-driven support capabilities to find promising insights early, even with comparatively small datasets [A5].

B. Open Foresight

During the last decade, the innovation management literature has gained momentum on the topics of growing interactions across organizational boundaries and organizations drawing on external sources of innovation. Accordingly, innovation management is on the same domain as foresight, also seeking to leverage the external environment to benefit organization. In particular, three research domains could be highly valuably linked to strategic foresight: external knowledge search, open innovation, and ecosystem conversations.

Literature on external knowledge search addresses problem-solving activities that involve the creation and recombination of technological ideas from sources outside the boundaries of the firm, including customers, suppliers, competitors, and research and dissemination sites such as universities [33], [72]. Here, organizations search for new knowledge elements beyond organizational boundaries and mix it with an existing knowledge base in order to create useful and novel combinations [57], [73]. Indeed, crossing of organizational boundaries is frequently a knowledge-brokerage process between heterogeneous domains leading to search activities in more distant and unfamiliar territory with greater success in problem solving [74] and a higher likelihood of breakthrough innovations [75], [76]. Discussions in this stream overlap with the terrain of strategic foresight [33], [62] in addressing where and how to search [77], the search object and search combinations [78], [79], as well as search timing [80].

Literature on ecosystems highlights the interactions between firms and centers on heterogeneous constellations of organizations, coevolution of capabilities, and cocreation of value [81]. As defined by Kappor [82], an ecosystem "encompasses a set of actors that contribute to the focal offer's user value proposition." While the ecosystem literature has interacted with the search perspective only recently, it has a long tradition at the intersection of innovation and strategy [83], [84]. Core questions in this stream address the simultaneous presence of complementarities and interdependencies between actors of the business system [85], [86]. Thus, relevant insights of ecosystem conversations for foresight have to do with technology substitution, investment, and coevolution or how firms gain superior performance by orchestrating their ecosystem [87], [88].

Literature on open innovation highlights purposeful use of knowledge from the external environment for value capture, appropriation, and innovation performance [89]. Since its original conception in 2003, the definition of open innovation has been broadened to include distributed innovation across organizational boundaries, and, today, several closely aligned research streams exist, such as Open Innovation in Science [90], or Open Collaborative Innovation including Open Source Innovation [91] and Community Innovation [92]. The field has many cross-linkages to external knowledge search and ecosystem research [33], [93]–[95]. Accordingly, the field offers several beneficial insights that interact with strategic foresight, for example, how to leverage external sources and networks for innovation, and identify promising inbound and outbound knowledge flows [96]–[98].

With reference to the fields of external knowledge search, ecosystem research, and open innovation, two overarching joint themes emerge. First, external interactions with distributed stakeholder beyond organizations' own boundaries have strongly increased. Stakeholders now include customers as well as other actors in organization's business environment or even other industries. In many cases, relationships have moved from contractual to relational, to a level where previously collaboration was unusual, for example, in anonymous communities. This has led to another key theme that organizational boundaries have become more permeable. Knowledge flows across a system of bounded and unbounded contributors and development activities are even commonly open to the public.

The strategic foresight literature has already started to take advantage of this, and we see a rise in publications to do with "open foresight." For the term "open foresight," Google Scholar returns 46 publications before 2010; 134 from 2011 to 2015; and 228 from 2016 to 2020, although the term is used differently across these sources, and a clear and unified definition of the term open foresight has not yet emerged in the literature [99]. Further, several authors refer to (open) collaborative foresight under the umbrella of open foresight, meaning a joint interorganizational form of foresight and knowledge exchange between several companies [100]–[104]. Going beyond the collaboration of firms, further authors, for example, Rau *et al*. [105], refer to the integration of all kinds of stakeholders, even unknown individuals, as open foresight. Similarly, Bootz *et al*. [106], after reviewing 45 foresight projects, conclude that firms increasingly interact with and make use of all kinds of external sources, including customers, suppliers, users, and competitors. Some authors differentiate further between passive integration, meaning an unobtrusive interaction, for example "netnography" of communities [107] and active integration, for example, the discussion between community members, in the foresight process [108].

Taken together, open foresight has strong ties to the recombination of ideas, trends, and inspirations from a wide range of external sources. It parallels literature on ecosystems with a focus on value network interactions and resonates with open innovation's focus on purposeful knowledge steering from outside sources. Accordingly, we understand open foresight as the systematic use of distributed information sources in order to anticipate the future corporate business environment and support an organization's strategic decision making [99]. In contrast to traditional corporate foresight, open foresight highlights the idea of a systematic stronger collaboration (active or passive) with external sources (firms and other, known and unknown allies).

In reference to this, in this special issue "Collaborative Strategic Foresight and New Product Development in Chinese Pharmaceutical Firms" [A6] takes an open collaborative foresight perspective, particularly studying how firms orchestrate their partner ecosystems to gain innovation insights and transfer these into action. The paper also takes a microfoundations perspective, suggesting how open collaborative foresight works in practice. Further, it addresses a theoretical question in how a firm's idiosyncrasies affect open collaborative foresight, raising the

aspect of ownership structure and its effects on new product development.

The paper "Social Media Analytics as an Enabler for External Search and Open Foresight" in our special issue also relates to open foresight in its focus on passive integration of external sources by way of a longitudinal dataset with more than 100 000 comments regarding Tesla from four social media sites [A7]. They show increasing external user scrutiny of Tesla's autopilot long before this became a public issue and also the differences in this across social media platforms. Their findings also address the call to study cognitive constraints and information overload, currently lacking in open foresight discussions.

V. Conclusion

In conceptualizing an IEEE-TEMS special issue on Foresight in Strategy and Innovation Management, and in this introductory article, we have sought to build bridges between strategic foresight and parallel areas of study in strategy, organizational behavior, and innovation management at a time when these various fields are increasingly already using each other's concepts and terms. Organizational theory has a longstanding orientation to exploring the relationship between organizations and their futures; the dynamic capabilities perspective sees a critical capability in renewing and aligning organizational resources to external changes; innovation management and entrepreneurship literature has embraced purposeful knowledge steering from the external environment, and so on; all commensurate with strategic foresight in its aim to identify superior courses of action in situations of future uncertainty and change. In this spirit, as discipline boundaries between what were previously fairly isolated knowledge pools are falling, we aim to catalyze the interface and potential integration of these conversations.

In order to contribute to this process, we have sought to give shape to the emerging overlaps and interactions by determining areas of common ground. Specifically, we have proposed "forward-looking search" as a meeting point of these various intellectual endeavors and also described four pillars of research activity that connect to it, these being Foresight as a Dynamic Capability, Foresight for Great Strategies, Foresight in New Product Development, and Open Foresight as described in the sections above, and in our diagram, Fig. 1. All of these are where related fields in strategy, foresight, and innovation share space.

In this, we hope to bolster the theoretical perspectives of strategic foresight and also infuse cognate fields in strategy and innovation with its concepts and methodologies. We also aspire to induce and steer further work across these fields, and, in this, here, we also refer to various recent foresight field bibliographical studies that underscore our objective to build bridges across streams for a more coherent body of knowledge. Münch and Gracht [109] comment that the futures and foresight field is a meta-discipline that draws on a broad base of literature and knowledge from all the other disciplines, while Iden et al [41] observe the plurality of strategic foresight's origins, and that strategic decision-making itself draws its approach from disciplines with different perspectives, frameworks, models, and paradigms. Fergnani [110] offers a bibliometric visualization of futures studies showing its relative isolation from allied fields, and in a bibliographical survey of 50 years of corporate and organization foresight, Gordon *et al*. [5] outline ways to redress this isolation, connecting the foresight field to open innovation, R&D innovation, strategic management, and organizational transformation discussions. The article presented here builds on that latter work by way of its focus on forward-looking search as common terrain on which researchers may increasingly build reciprocal relations between foresight and its cognate disciplines and bring the benefits of this to management decision makers.

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Appendix
Related Works

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