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Managerial sensemaking in a transforming business ecosystem: Conditioning forces, moderating frames, and strategizing options

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ABSTRACT

Disclosing the root cause of managerial action in environments undergoing change, is intrinsically linked to understanding how managers perceive both themselves, and their focal network including the broader surrounding environment. Despite an increased research interest into the interlink between sensemaking and strategizing, empirical evidence on how different limitations manifest in the sensemaking of individual managers in specific contexts is scarce.

This study focuses on individual level sensemaking in a transforming business ecosystem as a microfoundation of strategizing. It explores the diverseness of managerial sensemaking by comparing noticed cues, moderating frames and sensemaking outcomes as reflected in different strategizing options. The empirical data derive from 52 semi-structured interviews with top managers in a local business ecosystem. Based on our analysis, we develop an empirically grounded model that unwraps the frames that influence how managers perceive and interpret the changing environment and the implications for their business.

Our study provides important empirical corroboration to extant research on the cognitive microfoundations of strategizing in networked environments and adds detail to the underlying sensemaking mechanisms at play. The results highlight the local context and the identity embeddedness of focal actors herein, as factors that significantly influence managerial sensemaking in transforming business ecosystem contexts.

1. Introduction

The transformational impact of global changes in the business environment, as well as technological and business model developments, is of major concern for many industrial businesses and their capacity to sustain competitive ability in turbulent times. Already before the recent Covid-19 pandemic, managers have had to deal with increasingly complex changes in the business environment due to blurring market boundaries and shifting competitive positions through unexpected entrance of new market players (Burmeister, Liittgens, & Piller, 2016; Eisenhardt & Martin, 2000; Kiel, Arnold, & Voigt, 2017). Current and emerging technologies, such as artificial intelligence, 5G, blockchains, 3D printing, and cloud computing, indeed make sense of these new, complex environments, for strategic decision-making purposes, implies broad and multifaceted processes (Möller, 2016; Möller, Neonen, & Storbacka, 2020; Ramirez & Selsky, 2016).

A legitimate assumption is that making sense of what this transformation implies for existing business operations, and how to respond, is a demanding task for managers of incumbent business actors, irrespective of size, role, and position in an existing ecosystem. Individual managers, in different local business ecosystems, are coping with these challenges in disparate ways. What forms the basis of these different activities, are the managers’ theories-in-use (Argyris & Schon 1974 cited in Cornelissen, 2002, i.e. the idiosyncratic mental models or sensemaking frames that govern the way managers perceive, interpret, and construct meaning in the flow of events and inputs in their everyday life (Klein, Phillips, Rall, & Peluso, 2007; Weick, Sutcliffe, & Obstfeld, 2005). Our study builds on the cognitive strategizing approach (Abrahamsen, Henneberg, Huemer, & Naude, 2016; Laari-Salmela, Mainela, & Puhakka, 2015; Nystrom, Ramstrom, & Törnroos, 2017; Tikkanen & Halinen, 2003) which has looked at how different dimensions and emphases in the managers’ theories-in-use impact subsequent strategizing activities in networked contexts. However, we assert that our current knowledge on how managers actually make sense of these new,
complex and transforming contexts is vague.

In this study, we adopt the sensemaking perspective to add detail to the microfoundations of strategizing in a transforming business ecosystem context. Our aim is to delineate the central dimensions of managers’ sensemaking frames, and shed light on their role as constituents of the microfoundations of strategizing processes: We do so by exploring how individuals make sense of forces that drive change, and the potential strategic implications that these changes may have. Our study focuses on a particular network context, a transforming business ecosystem, entailing a business environment where the constellation of actors, activities and technological interrelations are undergoing radical change.

Theoretical conceptualizations of sensemaking in transforming ecosystem contexts have to our knowledge still not been presented, other than the seminal framework presented by Möller (2010). Studies on managerial cognition and sensemaking in networked environments in general, have focused on the relational aspects of sensemaking and its outcomes (Einola, Kohtamäki, Parida, & Wincenc, 2017; Henneberg, Naudé, & Mouzas, 2010; Medlin & Törnroos, 2014; Mouzas & Henneberg, 2015; Mouzas, Henneberg, & Naudé, 2008). In turn, extant research on individual sensemaking within the industrial networks literature highlight how actors’ network pictures condition their networking choices and the resulting network outcomes (Abrahamsen, 2011; Abrahamsen, Henneberg, & Naudé, 2012; Corsaro, Ramos, Henneberg, & Naudé, 2011; Czakon & Kawa, 2018; Henneberg et al., 2010). We argue that these theoretical conceptualizations need empirical grounding (see also Ramos & Ford, 2013). Research that would empirically explore and explain the underpinnings of managers’ sensemaking and add detail to the underlying dimensions of different sensemaking frames and the sensemaking mechanisms at work, especially in environments undergoing fundamental change, is lacking.

We argue that a more fine-grained understanding of how individual actors perceive what is going on in their environment and interpret its strategic implications when business ecosystems emerge or transform, is missing. In particular, the microfoundations of strategizing at the managerial level, in these specific courses of events, require more examination. The role of activities such as sensemaking, visioning, and sensegiving, have been presented as important antecedents of strategic change but lack empirical corroboration. (Möller, 2010; Möller et al., 2020; Möller & Halinen, 2017).

Due to the growing complexity of different socio-techno-economic trends with which managers across industries are confronted, we assert that empirical research focused on deepening our understanding of managerial sensemaking in this particular context is warranted. We contribute to the development of an empirically grounded model of a managerial sensemaking frame in a transforming ecosystem, by exploring managerial differences in perceptions and interpretations that impact the outcomes of managerial sensemaking. We believe that our results can advance the explanatory power that the sensemaking perspective can have in future studies on the microfoundations of strategizing in ecosystem contexts.

The paper continues with a discussion of the literature on sensemaking as a microfoundation of strategizing in a transforming business ecosystem. A presentation of the employed methodology, the research setting, and the empirical findings then follows. We emphasize that, despite the traditional article outline, the empirical findings have served as our guide for crafting an appropriate theoretical base. Informed by the grounded methodology (Birks & Mills, 2015; Gioia, Corley, & Hamilton, 2013), the theoretical background was crafted in alignment with themes that emerged from the analysis of the empirical information. The literature enabled us to refine the articulation of the empirically grounded themes and concepts in a reflexive and iterative manner. The paper concludes with a discussion of the findings in the light of current theoretical knowledge, chiseling out implications for theory and practice including limitations and avenues for future research.

2. Literature review

2.1. Network strategizing in a transforming business ecosystem

New and emerging technologies increase the interconnectedness of businesses and add more complexity to the networked business environment in which firms operate. The ecosystem concept has been adopted in order to highlight how technological advancements enable new types of interrelations between products, services and their modular combinations (Jacobides, Cennamo, & Gawer, 2018). The conceptualization of the ecosystem as a new type of value creation and value capture system, implies that the structure and interdependencies between different business actors has sprung to the forefront of analysis in understanding strategic activities in ecosystem contexts (Adner, 2017). Recent management and industrial networks studies (Aarikka-Stenroos & Ritala, 2017; Jacobides et al., 2018; Möller & Halinen, 2017; Shipilov & Gawer, 2019) argue for the usefulness of the ecosystem approach when conducting research in business environments undergoing transformation/change. These studies emphasize inter-organizational relationships and network formations, including the role of non-business actors, as antecedents of strategizing in ecosystem contexts (Aarikka-Stenroos & Ritala, 2017; Möller & Halinen, 1999, 2017).

Studies within the industrial network domain depart from the assumption that the embedding business environment, both amplifies and constrains strategic action (Möller, 2010; Möller & Halinen, 2017), Håkansson and Ford (2002, p. 137) defined strategizing in networked environments as being about “identifying the scope for action within existing and potential relationships and about operating effectively with others within the internal and external constraints that limit that scope.” This view was adopted by subsequent studies and has laid the ground for researching the “special conditions that operating in a network context brings to strategic actions of a focal firm.” (Möller & Halinen, 2017, p. 7) However, the view has also been criticized of being overly deterministic about the network environment and the inability of actors to shape it through purposeful management activities (Möller & Halinen, 2017).

In our study, inspired by Gadde, Huemer, and Håkansson (2003), we adopt an inclusive approach to strategizing and define it from an ontologically constructivist perspective. Thus, we define network strategizing as follows: the activities that actors (individuals or businesses) engage in in a networked environment in order to purposefully manage their internal resources, the resources and interdependencies between activities across company boundaries, and the organized collaboration among the companies involved. Strategizing in our view thus includes both activities that an actor takes in order to influence an outer environment (the strategic management view), such as launching a new technological product or solution, and the “efforts of a firm to influence its position in the network of which it is part” (Gadde et al., 2003), such as engaging in a strategic alliance with a complementor.

A business ecosystem in transformation is characterized by several factors that increase the ambiguity of strategic decision-making. Prior research also highlights that sensemaking occurs particularly in times of change, when there is ambiguity due to contradictions with existing meaning formations (Bien & Sassen, 2020; Weick, 1995). Previous studies focusing on strategizing in networks (Laari-Salmela et al., 2015; Nyström et al., 2017), have deemed the weickian sensemaking perspective, as essential “because the network environment is not transparent but must be learned and ‘made sense of’ through enacting with other actors and through cultural learning.” (Möller & Halinen, 2017, p. 7) Especially the network picture construct has been a central concept for operationalizing the mechanisms underlying the interplay between cognition and action that impact strategizing (Henneberg et al., 2010; Henneberg, Mouzas, & Naudé, 2006; Henneberg, Rohrmus, & Ramos, 2007).

We will next review in more detail the insights that we draw upon from sensemaking theory. We will then take a closer look at what the extant literature says about the role of sensemaking frames for sensemaking and strategizing. We will close the literature review section by addressing the research gap and the contribution we aim to make in relation to the existing literature.

2.2. Sensemaking as microfoundation of strategizing in networks

The study of cognitive antecedents of strategizing dates back to the work...
of March and Simon (1958). Their key argument was that “everyone in an organization brings a certain cognitive foundation, a set of givens to any management decision – assumptions about the future, knowledge about alternatives and a view of the consequences of pursuing each alternative.” (quoted from Kaplan & Tripsas, 2008, p. 791). The sensemaking paradigm (Brown, Colville, & Pye, 2015; Cornelissen & Werner, 2014; Kudesia, 2017; Maitlis & Christianson, 2014; Sandberg & Tsoukas, 2015; Weick, 1995; Weick et al., 2005) is perhaps the most influential research stream theorizing how perception and meaning construction underpin strategic decision-making in organizations. It rests on a social-cognitive approach to organizing and concerns how individuals notice, perceive and attribute meaning to courses of equivocal events, in their organization as well as immediate (i.e., local network) and distant environment (i.e., ecosystem). By making sense of “what is going on”, i.e. constructing plausible images that “organize flux”, assumptions about “what to do next” can be developed. (Weick et al., 2005).

Managerial cognition and sensemaking are thus key research constructs when aiming to unravel the “veiled” and microfoundational (Felin, Foss, & Ployhart, 2015) mechanisms underlying strategic action and change (Barr, Stimpert, & Huff, 1993; Dutton & Jackson, 1987; Gioia & Chittipeddi, 1991; Weick, 1995). According to Felin et al. (2015), the purpose of the microfoundational view “has been to unpack collective concepts to understand how individual-level factors impact organizations, how the interaction of individuals leads to emergent, collective, and organization-level outcomes and performance, and how relations between macro variables are mediated by micro actions and interactions” (p. 576). It is from this line of argument that we depart in our study. Our intention is thus to contribute to a more detailed understanding of the underlying microfoundational mechanisms of strategizing in a transforming business ecosystem.

The dynamic and embedded nature of strategizing in a transforming business ecosystem implies an ongoing interpretation and enactment of the environment, which are the basic mechanisms of sensemaking (Weick, 1995). As a process, sensemaking is inherently retrospective, iterative, and emerging. It is retrospective in the sense that an individual, bound to prior experiences, beliefs and theories-in-use (i.e. retained frames/mental models), selects which cues encountered in the environment he/she focuses upon and attributes meaning to (Klein et al., 2007; Kudesia, 2017). It is iterative in that cycles of interpretation and action form through feedback loops (Miller & Shattuck, 2005) as individuals based on their actions revise their existing frames, which in turn impact how they enact meaning in their environment (Gioia & Chittipeddi, 1991; Lundgren-Henriksson & Kock, 2016b; Weick, 1995). Finally, it is emerging in the way that the enacted environment is not only a reflection of the individual’s mind, but simultaneously a negotiation evolving outcome, as roles, positions and boundaries are actively constructed interrelatedly with other actors (Dahl, 2014; Nyström et al., 2017; Pattinson, Nicholson, & Lindgreen, 2018).

Similar to organizing, it is sensemaking that makes strategizing possible (Weick, 2001). Möller’s (2010) framework of sensemaking in emerging ecosystems provides a general illustration of how a sensemaking process of a business actor might unfold: The frames (network pictures and theories) of actors, form through the actor’s current network position, role and strategy, its learning culture, resources, capacity, as well as the characteristics of the enacted network context. Fig. 1, provides an adapted depiction of a network actor’s sensemaking process.

2.3. Managerial sensemaking frames

Individual sensemaking frames have a key role in determining how individuals perceive and interpret changes in the environment. Weick’s most basic level definition of frames is that they are “abstract representations” of things or events (Weick, 1995). The frames managers use in their sensemaking have a particularly important function especially in ambiguous contexts where “a multitude of demands and objectives at organizational and societal levels appear desirable in isolation” but are “inextricably connected and internally interdependent” (Hahn, Preuss, Pinkse, & Figue, 2014). The cues in the environment that individuals focus upon prods the activation of specific frames, but the frames that are activated also determine what is noticed – “neither one comes first” (Klein et al., 2007, p. 118). What characterizes sensemaking frames is that they are not a mere description of the point-to-point elements that moderate information-processing from the initial data to the understanding of this data in a waterfall model of cognition (Klein et al., 2007). In contrast, a sensemaking frame can be seen as a structure for accounting what the individual considers to be relevant data, guiding the individual’s search for more data, as well as being a reflection of “a person’s compiled experiences” (Klein et al., 2007, p. 118).

Extant studies have shown how sensemaking frames exert considerable influence in guiding interpretations made by managers on for example strategic issues (Daft & Weick, 1984; Gioia & Thomas, 1996), strategic and organizational change (Balogun, Bartunek, & Do, 2015; Balogun & Johnson, 2004; Lüscher & Lewis, 2008), competitive environments (Bogner & Barr, 2003; Hodgkinson & Johnson, 1994), cooperation (Lundgren-Henriksson & Kock, 2016a, 2016b) and positions and network relations (Abrahamsen et al., 2012; Einola et al., 2017; Mouzas et al., 2008). As Sandberg and Tsoukas (2015, p. S17) note, frames can be general, including various cultural templates (e.g., corporate, industrial, regional, and national) and ideologies (e.g., political, gender, institutional, and professional) or they can be specific, functioning as scripts for “this-is-how-we-do-it-here” in specific situations and environments. Often times the content of a frame is related to a particular domain, such as corporate strategy making or entrepreneurship (Hahn et al., 2014).

However, earlier research has pointed out that no specific frame automatically determines the sensemaking of decision makers (Hahn et al., 2014). Sensemaking both as a process and outcome, embraces aspects of managers’ frames that will be moderated by a range of personal, situational, and contextual factors (Sandberg & Tsoukas, 2015). Furthermore, in highly complex environments it is seldom enough to have one type of frame, but efficient sensemaking requires the use of several different that are combined and used alongside each other (Bogner & Barr, 2003; Hahn et al., 2014). Werner and Cornelissen (2014, p. 1459) argue that “the creation of new frames and any
emergent meanings involves combinations and contrasts, through shifting and blending, between prior frames.” Frame blending or frame shifting has been described as the mechanism through which individuals can approach situations that require changing existing logics of action (Werner & Cornelissen, 2014).

In our view, the social constructivist approach to sensemaking is appropriate for dealing with questions of strategizing in increasingly complex and flux environments, as it allows equivocal sensemaking based on both a nuanced understanding and reciprocal invention of the environment. We can assume that studying sensemaking frames enables the identification of more than just the cognitive elements of interpretation and meaning making and incorporates a broad variety of “factors implicated in the sensemaking situation” (Sandberg & Tsoukas SP 15).

3. Summary

Disclosing the root cause of managerial action in changing business environments is intrinsically linked to understanding how actors perceive both themselves in terms of abilities and network positions, and their focal network including the broader surrounding environment. In line with the cognitive strategizing perspective (Möller & Halinen, 2017; Nyström et al., 2017; Tikkanen & Halinen, 2003), our study builds on the premise that the sensemaking of managers constitutes the basis for strategizing in network environments. Sensemaking literature (Brown et al., 2015; Cornelissen & Werner, 2014; Kudesia, 2017; Maitlis & Christianson, 2014; Sandberg & Tsoukas, 2015; Weick et al., 2005; Weick 1979; Weick, 1995) identifies sensemaking frames as fundamental for decision making and action. Furthermore, the industrial network literature (Abrahamsen et al., 2012;Henneweg et al., 2006; Henneweg et al., 2007; Möller, 2010; Möller et al., 2020; Ramos & Ford, 2013), emphasizes the embedded nature of managerial sensemaking and the role of context specific frames (e.g. network pictures) as guides for strategizing in a networked context.

Despite an increased research interest into the interlink between sensemaking and strategizing (Mattsson, Corsaro, & Ramos, 2015; Möller & Halinen, 2017), empirical evidence on how different limitations manifest in the sensemaking of individual managers in specific contexts is limited (Abrahamsen et al., 2016; Corsaro et al., 2011; for recent exceptions see Czakon & Kawa, 2018; Laari-Salmela et al., 2015; Ramos & Ford, 2013). The ability to sense and act on emerging business opportunities is a crucial asset for strategizing in transforming business ecosystems (e.g. Mouzas et al., 2008; Nordin, Rayald, Möller, & Mohr, 2018). Managerial sensemaking in emerging or transforming ecosystem contexts thus constitute a particularly important research area. However, it is still an under-researched area (Möller, 2010; Möller et al., 2020; Möller & Halinen, 2017). Accordingly, our aim is to build empirically grounded knowledge on how cognitive limitations, relational ties, and affective dispositions, i.e. sensemaking frames, influence managerial sensemaking and the implications for strategizing in these types of contexts.

4. Methodology

4.1. Research setting and process

The initial trigger for this research paper stemmed from an opportunity to further examine the data produced by an extensive study among industrial companies, which aimed to document the perceived impact of business environment transformation on current business operations. The research setting is a North European regional business ecosystem comprising a few big global tone setting companies, and a network of SMEs that mainly derive their turnover from supplying the region’s big firms. The business ecosystem has grown from a highly traditional industry manufacturing cluster into a renewable energy oriented and innovation-centered ecosystem. The ecosystem now hives globally active enterprises, traditional manufacturing companies, several successfully internationalized spinoffs from the large companies, small service firms, and innovative startups.

The data in our study are derived from semi-structured interviews with 52 local business managers from 48 companies that are part of this ecosystem. The companies from which the managers were interviewed were purposefully selected. Following recommendations by Patton on purposeful sampling (Patton, 1990, 169), we selected the companies based on their information-richness in relation to the aim of the study. The business ecosystem consists of a couple of large companies which are globally active. We selected these companies for the study. Thereafter we listed local subcontractors of these companies to be included in the study. In selecting the subcontractors, we included component manufacturers (e.g. metal, plastics and electronics), software and service manufacturers, as well as, companies providing planning and engineering services. Thus, we assured that companies selected give a good picture of the business ecosystem and its transformation. Also, given the different types of companies included in the study, we sought to establish a broad and thorough identification of conditioning forces and moderating factors.

In the interviews, the issues discussed primarily concerned how the managers interpret and make sense of the ongoing changes in the ecosystem environment. The business leaders’ perspectives on how their company, as well as other actors in the business ecosystem, should respond to these changes were also highlighted. The role and impact of current and emerging technologies, as well as collaboration and innovation among partners, suppliers, and non-business organizations (universities, government and local municipalities, technological research centers), were also on the agenda. As the original study was designed without any specific theoretical orientations, the data set provided avenues for an inductively oriented exploration of managerial sensemaking in this locally based transforming ecosystem context.

Of the 52 interviews, 28 were recorded and transcribed, while notes were taken on 24 and written into protocol format. The interviews lasted from 1 to 3.5 h and were conducted between September 2017 and February 2018. In Table 1, the description of the sample and the informant data is aggregated to guarantee anonymity of the interviewees.

4.2. Data analysis

The first round of data analysis, thematic analysis into first-order grouping of operational data (van Maanen, 1979), resulted in the discovery of broad patterns. In a second round of analyzing all the transcribed interviews, we employed grounded theory coding approaches (Gioia & Chittipeddi, 1991; Gioia & Thomas, 1996; Glaser & Strauss, 1967), and the NVivo software tool for technical assistance. Both phases of analysis were conducted with an open mindset and the ambition to let the data speak. A grounded analysis method enables an open analysis of the empirical material, and the possibility of new theory emergence from the empirical data (Gioia et al., 2013; Glaser & Strauss, 1967). The use of two different analysis methods, and the continuous iteration of findings and insight among the co-authors, served the purpose of triangulation. This helped us in assessing convergence and establishing confidence in our findings. The grounded analysis served as the main method of extracting findings from the empirical material, and the coding outcome is presented in Appendix A.

The analysis started with reading through two interview transcripts in full (one global, one small firm), to get a preliminary feel for the data. Second, we read through all the remaining transcripts, to gain a more detailed and varied understanding of what kind of responses the interviews had produced. The formal analysis then started, i.e. an open coding procedure that generated a set of empirical categories of related concepts, resulting in an exhaustive number of 180 first-order codes (Corbin & Strauss, 1990). We employed two overarching questions, “what is going on here” and “what is this about”, as loadstars during the initial coding stages, to identify emerging themes from the material. Subsequent readings assembled similar ideas into common categories, and reduced the number of labels by identifying overlaps.

The grounded analysis method examined sensemaking in more detail by distilling themes (issue labels) and categories from the codes.

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within the phenomenon of interest, a method that has been deemed essential to understanding individual sensemaking (Gioia & Chittipeddi, 1991; Gioia & Thomas, 1996; Thomas, Clark, & Gioia, 1993). By using the constant comparison technique (Glaser & Strauss, 1967), and reviewing memos, we identified commonalities between categories and their relationships, enabling the formation of hierarchical structures. Simultaneously with the open coding, memos were written separately on ideas and thoughts that occurred in relation to the labelling of different codes, thus separating empirical observations from theoretically derived concepts. These memos were examined throughout the coding process, forming the basis of the analytical dimensions under which the first-order codes could be gathered. This method allowed for the comparison of emerging ideas from the data with the extant literatures, and vice versa, exemplifying the practice of abductive reasoning, which is integral to deriving generalizations from empirically grounded data analysis (Mantere & Ketokivi, 2013, p. 83).

During the analysis, it became clear that there were substantial differences between the interviewed managers' sensemaking on different issues, which led us to dig deeper into exploring what moderated managerial perceptions. This process is in accordance with the theoretical sampling process of grounded methodology, and is also characteristic of abductive grounded theory research (Birks & Mills, 2015). Through constant comparison of the relationships between different codes, as well as axial coding (Glaser & Strauss, 1967), we were able to detail what the emerging labels and categories could tell us about the moderating factors reflected in the differences in sensemaking of the need and urgency for strategic change. In accordance with sensemaking theory these moderating factors were conceptualized as sensemaking frames, impacting how managers perceive and interpret their environment and what meanings they construct out of these interpretations.

In the next section we present the outcome of the analysis, where we have moved from the initial empirical findings, presented in Appendix A, comprising first- and second-order coding, to a level of theoretical abstraction (Gioia et al., 2013; Gioia & Chittipeddi, 1991). The final model is grounded in the empirical data derived from the examination of the first-order codes, through a theoretical perspective informed by the existing sensemaking literature within the industrial network field. We next describe the empirical findings underlying the model, and our accompanying propositions, and discuss the components of the model regarding the existing literature on sensemaking in a networked context.

5. Findings and propositions

In the following sections, we first present the findings of our analysis, and then reflect on how our results deepen existing understanding on the microfoundations of strategizing in a transforming business ecosystem context. Fig. 2 presents an empirically grounded model of managerial sensemaking in a transforming business ecosystem. In the following sections, we discuss the model's components and underlying propositions. We briefly describe the environmental cues that trigger managers' sensemaking, then elaborate in more detail on the frames that moderate sensemaking and finally touch upon the sensemaking outcomes.

5.1. Conditioning forces as environmental triggers of sensemaking

Our analysis suggests the environmental cues that managers notice and bracket from the environment can be categorized under three major themes: New technologies, Global competition and market trends, and Properties of the local business ecosystem. In accordance with sensemaking theory, we use the term cues to capture those events that trigger sensemaking, by attracting the

| Sample | Size | Staff | Turnover | Balance sheet |
|--------|------|-------|----------|---------------|
| N = 48 | Global/Large (10) > 250 > 50 M € > 43 M € |
|        | Medium size (11) < 250 ≤50 M € ≤43 M € |
|        | Small (19) < 50 ≤10 M € ≤10 M € |
|        | Micro (8) < 10 ≤2 M € ≤2 M € |

Informant positions:
- CEO/CEO and owner (32);
- Vice president, CTO, Director (16);
- Middle manager (4)

Industries represented:
- Energy solutions, maritime technology/service, composite and plastic technology, ICT, project management services, industrial manufacturing, basic metal.

| Table 1 |
|---------|
| Data characteristics. |
| Sample | Size | Staff | Turnover | Balance sheet |
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**Fig. 2.** Empirically grounded model of managerial sensemaking in a transforming business ecosystem.
manager's attention and prompting engagement. The three themes that we identified from the cues, sum up what managers perceived to condition the existing business operations of the company and the current and future strategizing activities. The empirical data discloses that the managers participating in the study, experienced new technologies, global circumstances and properties of the local ecosystem as governing or even almost obliging forces, strongly influencing how to strategize. We therefore chose to label them as conditioning forces rather than just triggers.

New technologies, including the impact of digitalization, were perceived to push companies to change their intra- and inter-organizational processes, but also to revise their existing product or service offerings. Global competition and market trends urged managers to respond to external demands and requirements by making their maintenance services more agile, or by converting their current products into more holistic and sustainable solutions. The properties of the local business ecosystem, which embraces various regional actors (i.e. firms, institutional organizations for research, education and financing, the general infrastructure and society) were an important catalyst for driving global competitiveness and facilitation of strategic change. The enabling capacity of the local ecosystem was perceived to rest on two pillars: effective knowledge-sharing among regional actors, and strong regional brand that was key for attracting new customers and necessary talents. The local ecosystem furthermore provided a platform for regional pilot projects, whose purpose was to strengthen innovation capabilities to benefit the whole business ecosystem.

The cues that managers noticed and bracketed, demonstrated substantial diverseness regarding level of abstraction and detail. The range was from specific technological developments such as 3D printing, to implications of the interrelatedness of government policies on market prices of renewable energy. Please see appendix A for a detailed presentation of the coding results. The analysis also revealed that the interviewed managers assessed the relevance, complexity and impact of the cues rather differently. The interpretations differed regarding how the cues were perceived in the first place, but also regarding the resulting implications for different strategizing options. The differences in perceiving and interpreting the cues are discussed next. In the last findings and propositions section 4.3. we present how the managers made sense of the implications of the conditioning forces on different strategizing options.

5.2. Moderating frames in managerial sensemaking

Our analysis of the empirical data identified four main moderating frames: Technological insight, Latitude for strategic change, Business model boundaries, and Local identity embeddedness. These frames seem to have an explanatory role regarding the variance in the managers' perception and interpretation of cues in the environment. In line with sensemaking literature, we contend that these frames are idiosyncratic and that they are employed – consciously or unconsciously – when managers make sense of equivocal events in their environments. By comparing how the managers of the study individually experienced and interpreted the conditioning forces, we were able to identify interesting nuances of the nature and role of the frames that moderated their sensemaking.

5.2.1. Technological insight

"Digitalization will have a strong impact in the future. Many subcontractors and partners are far behind us in this... Investing in digitalization and applying it for operational development requires courage and risk-taking ...." Manager, Comp RA.

The managers of the study interpreted the role and impact of current and emerging technologies either in terms of their internal or external implications. Internally, new technology was expected to make internal operations and processes more efficient, through for instance digitalized processes, automation and machine learning. Externally, new technologies were considered to imply change by unlocking opportunities for the digitalization of current offerings, the creation of new offerings or even a reinvention of the product portfolio or business model. The ability to employ new technologies was by many managers perceived as integral to global competitiveness. Being able to deliver technologically advanced products was considered a means for differentiation and adding value.

However, some managers saw the alteration of their current processes and the incorporation of digital elements into their existing offerings as less straightforward than others. Technologies were not perceived sufficiently mature or the pricing was not yet reasonable. Managers who had a bird's-eye view of the transformation of the wider business landscape, generally perceived the force of technological changes pervasive. Managers who saw their companies as operating along more traditional technological lines were more hesitant to embrace new technologies. Some of the interviewed managers demonstrated a broad understanding of circularity in the interdependence between technological developments, global trends, policies, market demand, and new product and solution offerings. For instance, managers that had knowledge on how government policies impact the pricing of new technologies, used it to assess the urgency of implementing new technologies. Managers who exhibited broad technological insight, generally also more actively monitored and analyzed cues regarding global trends, and government policies.

In relation to these differences, managers also had different orientations towards investing in new technologies. Some perceived it as a necessity to take the risk now, in order not to fall behind the global competition since technologies were changing so fast. Others wanted to wait and see, until there was clearer external demand. Managers who expressed understanding of the possibilities and type of opportunities the new technologies could offer, saw new investments and changes in existing processes as much more necessary and urgent, than did the managers who had a narrow outlook on the technologies' possibilities.

“In this industry, we are part of the change, we are a change maker... we use technology that is quite established in other industries, and implement it in our customer's business... they have not yet begun to adopt these technologies even though they have been around for 20 years.” Manager, Comp RA.

Managers who had a narrow outlook on technological developments also relied more on the requirements coming from their customers or partners in assessing the importance of new technology: “I can't say for sure yet ... let's see how things develop around it [3D technology]. For the moment, according to customer needs, we mainly observe how things are developing ... the ‘situation’ is monitored and prepared for.” Manager, Comp DA. Managers that had a narrow outlook also expressed that they found the technologies hard to understand or considered them to be “hype”.

We named the managers' sensemaking related to the perception and interpretation of cues of new technologies as technological insight. The influence of the technological insight frame on the sensemaking of managers is supported by the current understanding of sensemaking processes in emerging business fields, where it is acknowledged that the novelty and complexity of technology influences the interpretation of its business potential (Möller, 2010). Our empirical findings and analysis align with existing theorization in networked environments: It has been noted that managers with advanced sensemaking capabilities regarding technology, can anticipate the potential development of new business opportunities (Möller, 2010; Normann, 2001; Ramirez & Selsky, 2016). Our findings are also supported by existing studies on technology frames (Kaplan & Tripsas, 2008; Orlikowski, 1992), which have studied the impact of technological frames on strategic decisions and their application and use. Thus, based on our findings and analysis we propose that:

P1. Managerial sensemaking of the implications of a transforming business ecosystem is moderated by the managers' frame regarding technological insight.

5.2.2. Latitude for strategic change

“When you participate in a shared project where the same requirements are manifested for everyone, ... everyone needs to align and meet up. So, if you want to be part of larger co-ventured customer projects you need to
have both the knowledge and the tools required.” Manager, Comp I.

According to the managers, an important aspect of digitalization and technological developments is that these infer change also in the needs and demands of their customers. As the customers become more aware of the benefits of new available technologies, and start to demand more technologically advanced solutions, the competition with global players for deals escalates. Furthermore, global customers have started to demand holistic solutions, which require co-created efforts of several actors to deliver a customized solution for a specific customer. This has led to the centralization of markets and a trend which favors bigger entities, requiring that all actors who want to take part in offering these holistic solutions adhere to the same quality standards of operation and delivery. Our findings tell that there is a general awareness among the managers that the increasingly interlinked nature of value chains and value networks, implies that product or service offerings are only as good as the weakest link in the chain. Some of the managers experienced an increasing concern about not only the price, but also their suppliers’ processes, and their ability to digitally integrate those processes into the processes of buyers.

The influence of the latitude of strategic change, as perceived by the managers, became clearly visible in our analysis. Managers representing regional big hub companies, and their partners, experienced a stronger need to transform their products towards more customer-integrated solutions and to bring value added through close cooperation on new innovative ideas. The managers of these companies perceived that they had the ability and resources that enabled them to engage in these types of strategizing activities.

“The collaboration with our biggest customer is very intense. We have received a position as a pilot company, so always when they have a project that they think suppliers could do or develop they call us. We have a fairly critical component and we have a certain level competence. So, they test their stuff here, which is great for us. It is a very close collaboration.” (Manager, Comp Q).

On the other hand, the latitude for strategic change of companies downstream the value chain, competing on traditional manufactured products–but not technologically more advanced solutions, was perceived much more limited. Managers who perceived their latitude for change limited also had fewer ideas about the need and direction for changes in their existing business. They perceived they had less resources to accomplish change, but also less degrees of freedom to act. As one manager commented on the question if they innovate together with their customers: “No, we are such a traditional subcontractor, so it is our principals who say and dictate what they want. They govern what we do.” (Manager, Company U). Some managers perceived global competition as a threat that had a lock-in effect on the strategizing options available to the company. These managers largely focused on making their internal processes more efficient and cost-effective. The managers still acknowledged that there were calls from their customers for more innovated products as this would benefit their business operations and competitiveness. But the resource scarcity and other limitations of SMEs in particular, as noted by several interviewed managers, was perceived to limit their ability to both innovate and develop new types of relationships with other ecosystem actors.

The frame moderating how managers perceived and interpreted cues calling for change as well as the corresponding perceived capacity to do so, we named latitude for strategic change. This moderating frame seemed to be interlinked with exposure to and understanding of the nature of the changes in the environment as well as the relationships the managers perceived their companies to have with their current customers and the regional business ecosystem at large. A plausible explanation for why some managers were more limited in their sensemaking of the impact of the conditioning forces, is their lesser exposure to and knowledge of the changes needed, compared with those in closer partner positions with their big global customers. This interpretation is supported by the extant literature on the impact of experience, network positions and roles on the sensemaking of emerging opportunities (Möller, 2010). Existing research has showed how innovation activities in complex transforming environments are often dependent on communication and joint learning facilitated by network relationships (Håkansson, Havila, & Pedersen, 1999; Powell, Koput, & Smith-Doer, 1996).

As Möller notes, “actors with narrow and highly specialized roles, often driven by the pursuit for higher efficiency in a demand–supply network context, may have a narrow outlook, preventing any wider or systematic sense-making of emergence and its opportunities.” (Möller & Svahn, 2006 cited in Möller, 2010, p. 365).

Based on our findings and analysis we propose that:

P2. Managerial sensemaking of the implications of a transforming business ecosystem is moderated by the managers’ frame regarding latitude for strategic change.

5.2.3. BM boundaries

“Our business model is not about selling services and software; we are a component manufacturer. We should consider – and this is a strategic business decision – whether we want to be a component supplier or a system supplier that offers system expertise. We need to decide whether we want to, and can, claim that position or if it is to be held by the next agent in the value chain, a customer, or a third, completely new actor.”

Manager, Comp ZA.

The perceived boundaries of the current business model (BM) clearly affected how the managers made sense of the conditioning forces, their implications and how to respond. The analysis, not surprisingly, revealed that the managers’ interpretations of the changing business environment, often resulted in situations where the managers were confronted with needs for strategic decisions regarding the footing of their business model. The need to further develop existing offerings, but also to create completely new offerings, were for many managers a key concern for sustaining competitive edge in a transforming business ecosystem. On the one hand, the managers perceived a strong imperative to invest only in current skills and core competencies to strengthen the present BM as any change in it would be against the strategic agenda. On the other hand, the ability to offer their customers more holistic and service-oriented solutions – often perceived to be just as important – called for investments in new skills and competencies.

A key issue raised in several interviews was accordingly the availability of, and access to relevant resources, talent, and strategic capability. Both were perceived to have a notable influence on companies’ ability to respond to changes in the business environment, and to make the necessary strategic decisions that would enable future success. The managers perceptions of these questions seemed to be inherently interlinked with their views of the boundaries of the existing BM of the focal company: Some managers perceived their BMs rather closed, as reflected in views that “no outside actors can develop our business for us, we have to do it ourselves” (Manager, Comp I) and “we need to hold on to our key competences and avoid risks of being copied” (Manager, Comp MA). Other managers, on the other hand, saw cooperation with other actors as ingrained in the dna of the company and that sharing responsibilities with suppliers and partners was vital for the operation of their BM. Depending on whether managers viewed their company’s BM as closed or open, perceptions of the impact of the different conditioning forces varied. Managers with more closed views of their BMs emphasized the impact of the conditioning forces on their own abilities and resources to respond in ways that would sustain competitive advantage. Managers with more open BM views on the other hand put more emphasis on the development of holistic solutions in collaboration with others as a strong global trend.

“Cooperation locally becomes indispensable, if we want to supply these holistic solutions here. How do we collect this set of actors so that we have partners, when we have local competitors with partly overlapping activities…? How do we get this confidential conversation, so that we could develop these together?” Manager, Comp F.
The challenge of staying competitive in a global business setting, requiring increasingly diverse knowledge and resources, has been the central issue of the open innovation literature (Chesbrough, 2003). The literature suggests, according to the original definition by Chesbrough (2003, p. xxiv) that “open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology.” However, the extant research suggests that strategic decisions regarding opening up innovation processes more generally, are integrally interlinked to the business model of the firm (Chesbrough, 2010; Saebi & Foss, 2015). Managers can have different perspectives of the boundaries and value creation logic of their business model, i.e. what kind of business model it is that their company has (Baden-Fuller & Morgan, 2010). Managerial perceptions regarding openness of the business model have previously been suggested as an important link between technological innovation and performance: As Baden-Fuller and Haefliger (2013, p. 424) note, “[T]he business model frames managers, entrepreneurs, and developers hold in their heads also determine the way in which technology gets developed … [and] choice of business model influences the way in which technology is monetized …” This gives support to our empirical findings that the different ways managers perceive the boundaries of their company's existing business model, whether it is seen as open or closed, has an impact on the way managers interpret the transforming business ecosystem and interpret its impact on strategizing options.

Based on our findings and analysis we propose that:

P3. Managerial sensemaking of the implications of a transforming business ecosystem is moderated by the manager's frame regarding boundaries of the focal company's business model.

5.2.4. Local identity embeddedness

“These sorts of extensive programs do not exist anywhere else. … And this is what I think is exceptionally good compared to many other places … This region is suitably sized, so the significance [of investments in ecosystem R&D infrastructure] is relatively broader than in other cities….” Manager, Comp A.

The local business ecosystem, including institutions for education, municipal actors, and financing institutions, was perceived to remarkably impact the sustained success of the companies in the region. Some managers perceived that their companies had benefitted extensively of being part of the local ecosystem while others did not have similar experiences. Many managers experienced that the shared history of the local businesses had created strong ties between the firms, and that they therefore were rather deeply integrated with each other's operations. Tacit knowledge within the local ecosystem and informal interaction that facilitates joint collaboration and innovation were perceived important. As one manager expressed it, “there is an understanding throughout the whole value chain... We have a common history, we know what kind of knowledge there is, there is knowledge in the supply network.” (Manager, Comp ZA) Relationships with various ecosystem actors were perceived to significantly either enable or restrict change in the company's existing business, where personal ties and trust between individuals was often highlighted as a vital factor.

Physical proximity was considered an advantage in many respects: cultural similarity and trust, speaking the same language, and adhering to the same codes of conduct. By knowing one another, having learned how to work together, and by understanding nuances of each other's language and needs, efficient collaboration and trust for the benefit of all, were enabled. These were factors that created a strong feeling of connection and “we-spirit” for some of the managers. Of course, past negative experiences were also evident in the data. These naturally implied a more disconnected stance regarding how the local ecosystem was perceived, resulting in reluctance towards committing resources to new collaboration projects or joint innovation. Those who perceived their companies to be well embedded in the region also perceived collaboration between local ecosystem actors as efficient. “We try to use local suppliers … those who are near.” (Manager, Comp HA) Local interaction was seen as a way to speed up product development activities. As Manager of Company Y noted: “Globalizing, but also localizing. Having the customer near is an added value! Lead times have become shorter and having the customer near also improves quality.” Physical proximity was also perceived to facilitate prompt identification of potential problems as well as real-time process adjustments.

The analysis revealed that the incentives for joint investments in innovation and product development activities with local partners, was also a matter of promoting the development of the local area in general. Several managers who felt a strong connection to the region and the local ecosystem, and who saw their business operations as tightly interwoven with the operations of other actors, naturally considered the development of the local business ecosystem highly important.

“We want to work locally here, in collaboration with local competencies and resources. We are not planning to move jobs away from this region… we feel a strong responsibility to ensure that our regional ecosystem functions. … All involved actors must unite in this so that our customers do not choose to take work somewhere else, like Asia or... We must all work together.” Manager, Comp L.

Those who had weaker ties with other actors, due to negative experiences, were much more reluctant to contribute to joint innovation activities and thus felt more disconnected from the local ecosystem. Positive exposure to triple-helix collaborations, or having a central role in the local ecosystem's value creation, seemed to impact the managers' perceptions of the importance of the local ecosystem for the continuous success of their own business. Less exposure or negative experiences seemed to have the reverse effect. Several managers perceived that the forces conditioning the transformation of the ecosystem would imply that collaboration and co-development among different local business partners (both old and new) was becoming more important. They also strongly linked this development to the continuous prosperity of the local region in general, and the importance of succeeding together as a value-creating ecosystem.

We termed the moderating frame related to the differences in perceptions and interpretations as local identity-embeddedness. The moderating effect of the local identity embeddedness frame, resonates well with previous research on sensemaking and identity construction in a network setting (Huemer, 2004, 2013; Schepis, Purchase, & Ellis, 2014). Managers construct the identities of their companies by answering the questions “who are we” and “what we are doing” in relation to other network actors and living out these answers through networking activities (Huemer, 2013). Managers who felt that their companies were rooted in the local soil and were well connected to the focal ecosystem, perceived local collaboration more important than those who were less connected. They also saw that “the real competition” is globally between ecosystems, not regionally between individual companies, strengthening the perceived importance of investing in the development of the focal ecosystem. Our findings argue for a growing importance of locality in the sensemaking of a transforming business ecosystem. However, this is clearly moderated by the managers' perception of the business's identity embeddedness in the focal ecosystem.

Based on our findings and analysis we propose that:

P4. Managerial sensemaking of the implications of a transforming business ecosystem is moderated by the manager's frame regarding local identity-embeddedness.

5.3. Spatial and temporal outcomes of managerial sensemaking

As detailed in the previous sections, the interviewed managers interpreted the cues from the transforming business ecosystem rather differently. Consequently, the managers also ended up with divergent views on how to respond to the changes in the environment. The moderating frames seemed to influence what meaning they ascribed to the cues they focused on in their sensemaking of the transforming business ecosystem. Thus, in terms of timing for example, some
managers considered the identified changes to require immediate strategic action, proactively seeking options to change existing ways of operating. As one manager decisively expressed:

“It requires that we are responsive, and that we develop our business all the time. ... All this requires us to be proactive here. We cannot, even if we financially are doing very well for the moment...we cannot afford to put our feet on the table and relax. We must constantly listen to our customer and see where the world is heading, and constantly develop our business … The change may be faster than you think. We have to be alert and react to it.” Manager, Comp L.

Other managers were much more hesitant, even reluctant, to adopt new technologies and modes of operation. They expressed a desire to wait for technologies to mature or for stronger signals from customers: “It’s a challenge to keep up with these technological changes. Take 3D printing for example. What do we know about this technology in 10 years’ time? The question is, at what stage to start investing? No one in their right mind would buy a printer today because you don’t know if it’s old in a year.” Manager, Comp U.

We termed these findings the temporal dimension of the outcome of sensemaking, and were able to distinguish between a proactive, reactive and in-active perception of the necessity for strategizing in response to technological developments, global demand and market trends, and local ecosystem properties. Managers who had a broad view of technological developments and the implications they could have for the company’s existing business, as well as were strategically enabled, felt much more urgency in changing existing ways of operating. These managers also often considered the business model boundaries as more open. Managers who were in a supplier position with less strategic latitude for change and considered business model boundaries less open, seemed to make interpretations that meant more reactive strategizing to changes in the environment. While suppliers who had a narrow technological insight and a narrow latitude for strategic change seemed to perceive that they could not with existing resources become active in any new strategizing activities.

How and where should then possible strategizing realize? Some managers relied on firm-centric actions, while others envisioned new structures and organizational forms at a strategic net or ecosystem level. These latter managers found that emerging and novel opportunities for the co-creation of value could be best addressed and capitalized on through deeper and wider collaboration outside the focal firm boundaries. Besides perceiving that collaboration and co-development between different business partners (both old and new) was becoming increasingly important due to the transforming ecosystem, managers in addition strongly linked this development to the continuous prosperity of the local region in general, and the importance of succeeding together as a value creating ecosystem.

“We should gather all the actors in the value chain around a common table, from component level to the seller and maintenance operator. The whole chain is found in the region, we could think about how we should do it, pilot it together, and bring it to the world. New products could come very quickly.” Manager, Comp ZA.

Firm-centric actions focused on the development of existing offerings; actions and strategic directions were interpreted as being dependent on the focal firm’s own activities and structures, as well as hierarchical and transactional relationships with partners and suppliers, customers, or third party actors such as universities or local governmental agencies. Strategic-net centered actions focused on developing new activities with outside partners and the goal of constructing new value proposition in collaboration with others; This included activities that would require limiting and naming the number of participants, and be clearly commercial ventures with the goal of producing new holistic solutions for international markets. Firm-centric actions seemed to be mostly related with moderating frames of closed BM boundaries and disconnected local identity embeddedness frames. Strategic-net centered strategizing activities on the other hand were clearly related to perceptions of more open BM boundaries and more connected identity embeddedness.

Local ecosystem centric activities related to enhancing the effective functioning and competitiveness of the local ecosystem in general. Here managers identified actions requiring triple-helix type collaboration, the activation of different actors across the business ecosystem, knowledge sharing on digital platforms, ecosystem-level prototyping projects and political activity to get required financial infrastructure. The third perspective was clearly demonstrated in several managers’ visions of how individual companies and the region could better reap the benefits of ecosystem-level value creation and related to perceiving the local identity embeddedness as strongly connected to the local region.

Managers who perceived their company’s possibilities for strategic change limited seemed to be more inclined towards firm-centric strategic changes and often more reluctant to take strategic decisions for change. Managers who envisioned more radical organizational transformation that should be built collaboratively with different ecosystem participants, had an open perspective of the focal company’s business model as well as a more connected identity-embeddedness in the region in general. Those managers who also had a deeply connected identity-embeddedness in the region perceived it possible for the ecosystem as a whole to be proactively creating opportunities to do something different and novel in the global market arena, rather than just reacting to market trends and sustainability requirements coming from the outside.

Based on the empirical findings we propose that,

P5. The frames related to technological insight, latitude for strategic change, business model boundaries, and local ecosystem identity embeddedness moderate managerial perception and interpretation of strategizing options related to timing and space.

6. Conclusions and contributions

The question this study set out to explore is how managers make sense of a transforming business ecosystem, and what they perceive are the implications for their current business. This question has not been extensively studied empirically, but is a timely concern due to the growing complexity of different socio-techno-economic trends with which managers and researchers alike are confronted. We approach the research task via the sensemaking perspective, justifying this choice by its vital role for exploring strategic decision-making on the individual level. With this focus, our aim is to shed light on the individual level microfoundations of strategizing in a transforming business ecosystem context. Through an abductive research process, the contribution of our study centers around the detailed exploration of moderating frames, that seem to explain diverseness in managerial sensemaking of the changing environment.

As our findings suggest, what cues managers notice and focus on, and how they attribute meaning to perceived changes in the business environment, comprise aspects beyond the obvious technological and competitive characteristics of transforming business ecosystems. We find support for previously presented models (Möller, 2010), in terms of how sensemaking of roles and positions as well as capabilities and resources impact sensemaking outcomes. In addition, we are able to depict aspects that have received less attention, such as the local territorial ecosystem and the actors’ identity-embeddedness, influencing the sensemaking process. We argue that the environmental cues managers focus their sensemaking upon can be abstracted into three major themes: New technologies, Global competition and market trends, and Properties of the local business ecosystem. The managers perceive these as forces that condition the implications of the transforming business ecosystem on their business. Our findings suggest that the frames that managers use to make sense of these forces, are idiosyncratic, but exhibit commonalities that allows them to be aggregated into four different types that seem to explain where key differences in sensemaking originate: We propose that there are four different sensemaking frames, that moderate the managers’ perception and interpretation of the meaning of the cues and what implications they have for subsequent
strategizing options. These frames are termed Technological insight, Latitude for strategic change, Business model boundaries, and Local identity embeddedness.

The suggested propositions add important, empirically grounded, detail to the extant knowledge of sensemaking in a networked context. Earlier studies have theorized different dimensions of sensemaking of radically changing business environments (Möller, 2010). Yet, this study is to our knowledge the first in this context that provides empirical corroboration for such a framework, capturing the actual content of managerial focus and attention (cues from the environment), theories-in-use (moderating frames), and visioning and agenda construction (sensemaking outcomes). The results of our study also contribute to the few existing studies (Abrahamsen et al., 2016; Laari-Salmela et al., 2015; Ramos & Ford, 2013) that go deeper into the actual “practitioner theories” in an industrial network context. Our contribution broadens the scope of these previous studies that have looked at the relationship between practitioners’ sensemaking frames and strategizing, by considering also technology and identity embeddedness as important frames in the network actors sensemaking process.

Accounting for the theoretical and practical contribution of this study, we draw support from Möller’s (2010) argument that it is essential to understand network actor sensemaking, if we want to clarify the underpinnings of the networked emergence of new business fields. We contribute to this discussion by highlighting that differences in individual level managerial sensemaking has a central role in understanding the microfoundations of firm level decision-making, as well as strategizing more broadly, in a transforming business ecosystem context. The way managers frame and interpret the transforming business ecosystem context impacts how they perceive the need for changing their existing business, and the strategizing options they envision as feasible in the future. By focusing on individual sensemaking frames as a microfoundation of strategizing in a particular business environment, our goal has been to build a basis for future research that can take a more longitudinal and multilevel approach to studying the microfoundations of strategizing in transforming business ecosystems.

6.1. Theoretical and managerial implications

The most interesting findings of our study relate to the local ecosystem properties as a perceived conditioning force, and the local identity-embeddedness frame as a suggested moderator of managerial sensemaking in a transforming business ecosystem. On the basis of our empirical data, we propose that this frame moderates how managers perceive other actors, the physical and social territory and the properties of the local business ecosystem in general. Furthermore, it moderates how they interpret the feasibility of expanding collaboration with other actors to find new strategic directions and vision responses to business environment changes. This finding provides important empirical corroboration for the IMP view on socio-cognitive mechanisms of strategizing (Lowe & Rod, 2018; Nyström et al., 2017) and advances further theorization on the subject. Our findings argue for a growing importance of local identity for strategizing in a global world and shed light on the sensemaking mechanisms underlying this development.

Our research offers several elements of consideration for practitioners, both managers and policymakers. Being aware of the impact of sensemaking frameworks on subsequent strategizing is essential, if managers want to be able to respond effectively to the ongoing changes in their company’s environment. However, the current sensemaking frames do not necessarily determine how things will be perceived and interpreted in the future. Being able to question and challenge existing frames, is a question of the willingness to accept “becoming lost” and then setting out to “find yourself” again (Colville & Pye, 2010). Thinking about technological frames (Bogner & Barr, 2003; Kaplan & Triapas, 2008), strategic frames (Nadkarni, Herrmann, & Perez, 2011; Raffaelli, Glyn, & Tushman, 2019), network pictures (Abrahamsen et al., 2016; Ramos & Ford, 2011) or business model frames (Aversa, Haefliger, Rossi, & Baden-Fuller, 2015; Baden-Fuller & Morgan, 2010) as cognitive tools that can be explored, evaluated and reframed through purposive practices is a good starting point. As Cornelissen and Werner (2014) note, managers can come up with new ways of thinking about their environment by comparing cognitive frames that they are familiar with and other frames that they do not yet fully understand. Breaking the existing mental frames of oneself and others is, at its core, a social process requiring exposure to the ideas of others, and being active in enacting the new frames that are formed with those others.

Our findings are important also for policymakers who strive to enhance the renewal of existing business in traditional industries that are falling behind in the challenges of digitalization and global competition. This study shows that cooperation with a broad network of actors (triple helix) and the company’s identity-embeddedness in the local business ecosystem, in fact, influence how managers experience global competition and market trends such as environmental changes, as well as, the need for strategic actions. Hence, in targeting current initiatives such as European Green Deal and EU’s industrial policy a key task at a regional level is to create a strategy and policy-mix putting triple-helix cooperation at the very center. Moreover, the sensemaking perspective is an important component to consider in formulating and implementing regional growth strategies and initiatives. Given findings on the idiosyncratic nature of sensemaking, it is of outmost importance that policymakers set up inclusive and interactive processes where managers share their mental models about conditioning forces and outcomes at a firm- and ecosystem level. In this way, there may be a gradual learning and potential for strategic change.

6.2. Limitations and future research directions

The Managerial sensemaking in a transforming business ecosystem model, and the propositions on which it is built, should be regarded as a first step in explaining sensemaking as a microfoundational mechanisms of strategizing in this type of business environment. While we have explored and described the different frames that moderate managerial sensemaking in this specific context, we want to point out that our intention has not been to reify these as static premises of strategizing. We wish to acknowledge that our study is a snapshot picture of sensemaking frames that are dynamic in nature and dependent on situation specific interrelations between individual sensemaking and environmental context. However, it provides a steppingstone for inquiring further on the role and impact of different sensemaking frames on strategizing in transforming business ecosystem contexts.

Another limitation of the study is that it has focused on individual top managers’ sensemaking frames. We acknowledge that moderating frames exist on many different levels, the individual, the organizational and inter-organizational, as well as on the institutional level (Cornelissen & Werner, 2014). It remains for future studies to broaden the unit of analysis to multiple levels of sensemaking, such as intra-organizational and inter-organizational aspects and sensegiving, which are central aspects of organizational sensemaking and strategizing in general (Brown et al., 2015; Maitlis & Christianson, 2014; Sandberg & Tsoukas, 2015). The sensemaking frames perspective taken in this study should also be broadened to incorporate other more embodied, discursive and processual aspects of sensemaking (Lowe & Rod, 2018). Different theoretical lenses and multi-methodological approaches could be applied in future studies to understand how sensemaking and strategizing in practice are enacted in companies situated in transforming business ecosystems (Jarzabkowski, Balogun, & Seidl, 2007; Sminia, 2009; Whittington, 2006).

Although the research offers important insights deepening our knowledge of differences of managerial sensemaking in transforming business ecosystem contexts, the study is explorative in nature and future research should validate our findings. Our contribution gives renewed impetus to the significance of the sensemaking perspective regarding the microfoundations of strategizing and decisions concerning technology commercialization, relational and power aspects.
regarding strategic ability to change, the structural characteristics of value creation (the business model) and dimensions of regional identity-embeddedness. We hope to validate our findings in future empirical work, and explore whether our findings can be generalized to explain differences in subsequent strategizing activities of network actors in transforming business ecosystems. The next step in examining the generalizability of our findings could be to conduct additional in-depth studies in different regional business ecosystems. Another opportunity to explore the generalizability would be to test our propositions in other business ecosystems of a similarly transforming nature.

To strengthen the findings of this study, future research could make use of a range of methodological procedures. The qualitative abductive research process utilizing grounded theory principles of data analysis that was deployed in our study could be complemented with different qualitative or multimethod research designs. A potential next step for theorizing further from our study could be, for example, to utilize discursive analysis to gain a more fine grained understanding of how individuals at the level of speech and social interaction, through the use of symbols, metaphors and stories, frame change in their environment (Cornelissen & Werner, 2014). Our findings could be strengthened by a more in depth study of how individuals blend or shift different sense-making frames to make sense of complex environments and shape them (Werner & Cornelissen, 2014). This could also enable researchers to further theorize the microfoundations of shaping strategies (Nenonen & Storbacka, 2020) in transforming business ecosystem contexts.

Appendix A. Presentation of coding activities and results

| Main analysis activity | Open coding and constant comparison | Axial coding and selective coding | Theoretical abstraction |
|------------------------|-------------------------------------|----------------------------------|------------------------|
| 1st order items        | 2nd order themes                    | Aggregate dimensions             |
| Technological developments |
| New technologies that are considered important: Digitalization in general, Big Data / Smart Data, AI, smart, hybrid and interdisciplinary technologies, IoT, 5G, Internet of Things, Cybersecurity, energy storage and battery technology, Electric vehicles, and Smart grids |
| Process and structure developments |
| Requirements for changes in company processes and documentation |
| Increased demands for automation |
| Need to constantly develop business |
| Same rules for big and small, part of the same value network |
| Global demands |
| Requirements of fast reaction time due to global business cycles |
| International customers demanding more holistic solutions |
| Services becoming increasingly important for sustaining customer relationships |
| Taking over responsibilities from customers due to customer’s lack of knowledge |
| Integration of processes between supplier and customer through digitalization |
| Market changes |
| Cost pressure from global players |
| Entrance of new competitors |
| Competitive ability in region to avoid offshoring |
| Specialization and adding smart technologies for competitiveness |
| Centralization of markets |
| Trends and policies |
| Government policies impacting price and feasibility of new technological investments |
| New generations (millennials) having new preferences for consumption and worldlife |
| Demands for sustainable business increasing due to public opinion, customer demands and government policies |
| Trends in lifestyle changing society overall |
| Reasons for local ecosystem success |
| Entrepreneurial business cluster keeping the region alive and creating a particular atmosphere in the region |
| A unique region with triple helix partners for knowledge development and innovation projects |
| Local strategy development gives common goals and moves the region as a whole forward in the same direction |
| University-Business collaboration projects have been successful between Big local actors, but not SMEs |
| Mechanisms of local ecosystem functioning |
| Cluster marketing important for developing the attractiveness of the region as a whole |
| Benefits of doing business with local ecosystem actors - same history, culture, language and trust |
| Physical proximity between partners for innovation is seen as important |

Environmental forces

Local ecosystem properties
| Main analysis activity: Open coding and constant comparison | Axial coding and selective coding | Theoretical abstraction |
|-----------------------------------------------------------|----------------------------------|------------------------|
| 1st order themes                                          | 2nd order themes                 | Aggregate dimensions   |
| Right timing is difficult, but of essence, in investing in new technology | Technological insight            |                        |
| Individual actors should have more courage and be more willing to take risks |                        |                        |
| It is very difficult to invest in something that you don't yet understand |                        |                        |
| It is safer to follow how technologies develop and make decisions when there is proper customer demand |                        |                        |
| It is very natural to develop the processes and make innovations as a strategic partner when knowledge goes both ways | Latitude for strategic change    |                        |
| Big customers pressure their suppliers so much that there is not resources to innovate |                        |                        |
| Some SMEs are just not hungry enough to stay on top of the global requirements |                        |                        |
| There is a lack of trust between the suppliers and their customers to share information that would enable further development |                        |                        |
| Changing the existing business model goes against the strategic intent of the company | Business model                  |                        |
| The current size of the company restricts certain type of new projects to be realized |                        |                        |
| Existing resources do not give ability to renew             | Identity embeddedness           |                        |
| Being part of developing the region In itself has value for many on a personal level |                        |                        |
| Different actors should acknowledge that we are all in the same boat |                        |                        |
| Personal contacts is often key to any kind of new project developments or innovation initiatives |                        |                        |
| Existing bad experiences have made many reluctant of putting resources into new collaboration projects |                        |                        |
| Foreign ownership of historically regional companies has moved away decision making from the local level |                        |                        |
| Business cluster prototyping projects would gather together actors for concrete end results | Focal ecosystem centric          |                        |
| There should be institutions for applying new sources of innovation financing and these should be made more readily available in the region |                        |                        |
| Platforms for knowledge sharing between ecosystem actors should be built up |                        |                        |
| Consensus thinking could give a needed structure for SMEs to become active in innovation projects | Strategic net centric           |                        |
| New knowledge requirements means also intensified cooperation, co-creation and development with existing partners |                        |                        |
| If the needed knowledge is not found in the region it means new partners must be found elsewhere |                        |                        |
| Need to make technological investments and process changes to keep up | Focal firm centric             |                        |
| Individual firms must secure the acquisition of new capabilities and know-how through proper talent management strategies to match coming business requirements | Proactive strategizing          |                        |
| Strategic management capabilities are essential               | Reactive strategizing           |                        |
| If decisions are not taken now, it will soon be too late and competitiveness will be lost | Inactive strategizing           |                        |
| This region has all the potential to be at the top of the world, requires only courage |                        |                        |
| Decisions should be taken according to customer demand        |                        |                        |
| We follow how our customers develop their technologies and make decisions according to those |                        |                        |
| It is very unclear what these changes mean for our business |                        |                        |
| Existing operations are given priority |                        |                        |
| There are no slack resources to be used for new openings |                        |                        |

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