Abstract

The ecosystems concept is on the rise in both research and industry practice alike. Prospectively, they will change the way decision-makers deal with key managerial aspects such as strategy, innovation, organisation and competition. Within ecosystems, distribution of attention is crucial, since all ecosystem partners involved are pursuing their individual agendas and it is the core duty of the orchestrator to align these in order for the joint value proposition to come true. Since attention is distributed via organisational structures, more specifically the so-called procedural and communication channels, it is key to understand how firms shape such channels not just within their firm but also towards the partners involved in the ecosystem. In an attempt to shed light on this context, this paper applies a qualitative study with eight cases and, based on the attention-based view of the firm, contributes to research on ecosystems in several ways. First, and foremost, we show three different types of procedural and communication channels, thus providing a better understanding of how ecosystems are structured and governed. Second, we shed light on the explicit design of these procedural and communication channels by the orchestrator in order to shape the attention of the ecosystem partners. Third, our findings provide a more differentiated view on the role and function of orchestrators. Fourth, in so doing, we specify the requirements under certain contingencies for the orchestrator.

Keywords: Ecosystem, Ecosystem Organization, Ecosystem Alignment, Attention-based view of the firm, Attentional structures, Procedual and Communication Channels
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1 Introduction

The enduring popularity of the attention-based view of the firm (Ocasio, 1997) illustrates that the attention of managers is now widely considered one of the most critical and significant resources in firms (Ambos & Birkinshaw, 2010; Hoffman & Ocasio, 2001). According to the attention-based view, organisational decision-making and, thus, their actions and outcomes depend on the allocation of decision-makers’ attention – defined as “the noticing, encoding, interpreting, and focusing of time and effort” (Ocasio, 1997, p. 189)– across issues and action alternatives (Ocasio, 1997).

A substantial stream of literature has confirmed the relevance of attention for such outcomes as subsidiary performance (e.g. Ambos & Birkinshaw, 2010), strategic change (e.g. Cho & Hambrick, 2006), crowdsourcing initiatives (e.g. Piezunka & Dahlander, 2015), reaction to external threats (e.g. McMullen, Shepherd, & Patzelt, 2009), search for innovations and opportunities (e.g. Barnett, 2008), timing of product market entry (e.g. Eggers & Kaplan, 2009) and investments in and adoption of new technologies as well as innovations (e.g. Maula, Keil, & Zahra, 2013).

Decision-makers’ attention is influenced by the situation and structures they find themselves in (please, also see Gavetti, Levinthal, & Ocasio, 2007; Ocasio, 1997). Thus, the intersection of attention and its structural antecedents lies at the very heart of the attention-based view (Ocasio, 1997). However, existing works on such structural antecedents (e.g. Barreto & Patient, 2013; Cho & Hambrick, 2006; Palmié, Lingens, & Gassmann, 2016) are focusing on the single firm as the unit of analysis. Whilst such perspective is of great significance (Gavetti et al., 2007), Ocasio (1997) initial outline as well as the theoretical foundations of the attention-based view (please, see Cohen, March, & Olsen, 1972; Cyert & March, 1963) view firms as open systems being embedded in the environment and populations of other organisations. This implies that individuals’ attention is not solely influenced by the structures of a focal firm but also through
interactions and cross-links with other organisations. Thus, a less firm-centric perspective on attention distribution offers enormously promising research opportunities by understanding inter-firms structures as antecedents of attention (Gavetti et al., 2007; Maula et al., 2013).

Such perspective is all the more important given the recent rise of the ecosystem (Adner, 2017; Jacobides, Cennamo, & Gawer, 2018a; also see Moore, 1993) as a new and distinct organisational form, which is increasingly replacing the individual corporation as the sole unit of analysis (Baldwin, 2012; Jacobides et al., 2018a). This concept has seen a remarkable boom in industry practice (Jacobides, Reeves, & Fuller, 2018b) and managerial research (Adner & Kapoor, 2016) alike and has become pervasive in discussions of strategy, both scholarly and applied (Adner, 2017) – Numerically expressed, over the last five years, the quantity of articles about ecosystems having been published by the leading journals has increased by seven (Jacobides et al., 2018a)!

Besides the interesting extension of the attention-based view, studying the ecosystem concept from this perspective opens up great opportunities for a better understanding of ecosystems as well. This is, since ecosystems are a group of organisations, which jointly create a value proposition for the customer a single firm could not offer in isolation (Adner, 2017; Moore, 1993). Since all organisations involved are pursuing their individual agendas and expect a sufficient return on their contributions, a focal firm, the orchestrator\(^1\), needs to align the ecosystem actors towards the joint value proposition (Adner, 2017; Jacobides et al., 2018a).

Such alignment implies that ecosystems are run with distributed decision-making processes, which, according to the attention-based view, require a distribution of attention among the ecosystem partners (Ocasio, 1997). On top of this, ecosystem actors can only recognise and

\(^1\) In this paper, we use the term “orchestrator” and do not distinguish to other terms being used in existing literature, e.g. orchestrator (Altman & Tushman, 2017; Leten, Vanhaverbeke, Roijakkers, Clerix, & Van Helleputte, 2013), keystone (Clarysse, Wright, Bruneel, & Mahajan, 2014; Iansiti & Levien, 2004a), hub firm (Jacobides et al., 2018a; Nambisan & Baron, 2013), focal actor (Adner, 2010, 2016, 2017), or ecosystem leader (Moore, 1996; Teece, 2016).
jointly act upon the joint value proposition if they focus their attention on it, since individuals are unlikely to act on opportunities that do not catch their attention (Barnett, 2008; Ocasio, 1997). This rises the question of how firms can shape inter-organisational structures among ecosystem actors in order to allow for an appropriate allocation of attention.

Despite its great significance for research on both the attention-based view and ecosystems, this question has not been answered sufficiently yet. First, to our knowledge, the attention-based view has not been applied to ecosystems nor to other forms of inter-organisational networks or meta-organisations so far (with the study of Maula et al. (2013) on the saliency of industry peers and VC-funds and its influence on the attention of managers to technological chance being the noteworthy exception).

Second, even though ecosystem research has dealt with questions related to fields such as strategy (e.g. Kathleen M. Eisenhardt & Galunic, 2000), organization (e.g. Kapoor & Agarwal, 2017; Kapoor & Lee, 2013) and innovation (e.g. Clarysse, Wright, Bruneel, & Mahajan, 2014), it has rarely addressed inter-firm organization within ecosystems yet. The few studies dealing with such organizational aspects have focused on the impact of the structural features or the organization on the performance of complementor firms (e.g. Kapoor & Agarwal, 2017) or the investment in new technologies (e.g. Kapoor & Lee, 2013). Others addressed the positive impact the organizational design of an ecosystem might have on distributed innovation (e.g. Baldwin, 2012), the competitive dynamics and various coupling patterns within ecosystems (e.g. Brusoni & Prencipe, 2013) and the nature and effect of the dynamic interactions between strategic thinking and entrepreneurial activities (e.g. Zahra & Nambisan, 2012). The same is true even for research on meta-organizations in general, since “organizational studies have focused mostly on ‘individual-based organizations’, while organizations with organizations as members (i.e. ‘meta-organisations’) have been largely ignored” (Bres, Raufflet, & Boghossian, 2018). Previous literature on meta-organizations focused on organizations with strong mandates...
to organize their fields, such as industry associations (e.g. König, Schulte, & Enders, 2012) or organizations developing regulations (e.g. Boström, 2006; Scheytt, Soin, Sahlin-Andersson, & Power, 2006). However, many contributions within this stream pertain to membership management (Bres et al., 2018) in which aspects of authority occupy an exposed position (Gawer, 2014; Gulati, Puranam, & Tushman, 2012). Specifically, research has identified requirements and success factors for membership such as the importance of status and recognition (Ahrne & Brunsson, 2008; Scheytt et al., 2006) and the need of diversity (Boström, 2006) as well as dynamic in terms of status and responsibility (König et al., 2012). Despite these studies, literature has not yet provided a satisfactory understanding of organizational structures between firms and points out the need for further studies in this realm (Gulati et al., 2012).

In order to address these gaps, this paper applies a qualitative multi-case study with 8 cases. In doing so, it intends to contribute to the attention-based view of the firm (Ocasio, 1997) and the ecosystem concept (Adner, 2017; Jacobides et al., 2018a) in several ways. First and foremost, we extend the attention-based view to ecosystems and, thus, contribute to its embarkment from intra-firm structures as antecedents of attention towards inter-firm structures. More specifically, we show how firms shape so-called procedural and communication channels (Ocasio, 1997; Stinchcombe, 1986), among the ecosystem partners. Second, we show how firms can shape attentional structures among actors in order to appropriately allocate attention within ecosystems. This leads to a better understanding of how ecosystems are structured and governed, thus answering the related call by Jacobides et al. (2018a). Third, our findings shed light on how orchestrators manage their ecosystem partners and secure their position within the ecosystem.
2 Literature Review

2.1 Key aspects of the ecosystem concept

The growing literature stream in the ecosystem context has been driven by several authors in recent years. As a baseline, the ultimate purpose of an ecosystem is the materialization of a joint value proposition by several players, which cannot be achieved by one of these players in isolation (Adner, 2017; Adner & Kapoor, 2010; Kathleen M. Eisenhardt & Galunic, 2000; Hannah & Eisenhardt, 2018; Jacobides et al., 2018a; Moore, 1993). This type of inter-firm collaboration opens a wide range of opportunities for firms such as the development of novel technologies, products or markets as well as access to resources and competencies a single company would not have available by itself (Adner, 2006; Moore, 1996). Though, the ecosystem partners are only capable of creating a joint value proposition if it is decomposable into several independent modules that can be produced independently by the actors involved (Baldwin & Clark, 2000; Jacobides et al., 2018a). These complementary modules increase either the mutual value (the so-called supermodularity) (Milgrom & Roberts, 1990; Topkis, 1998) or do not function without each other (Teece, 1986). Therefore, the partners are required to specifically create new or at least mutually adapt existing modules matching to the modules provided by the other players (Baldwin & Clark, 2000; Jacobides et al., 2018a). For this reason, they need to be mutually aligned with each other towards the joint value proposition (Adner, 2017). Inherently, this alignment is multilateral, i.e. the connections among the players cannot be composed into bilateral arrangements, in order to ensure that all modules fit together and exploit the full potential of the complementarity (Adner, 2017; Jacobides et al., 2018a).

This implies a strong dependency among the partners, especially since the mutual adaptation of the modules causes considerable adjustment costs (Adner, 2017; Jacobides et al., 2018a). Thus, in case one player fails or leaves the ecosystem, the entire structure is threatened, which is all the more critical since actors of an ecosystem are still independent economic actors with their
individual agenda and goals (Dattée, Alexy, & Autio, 2018; Moore, 1996). This leads to the necessity of an orchestrator, a pivotal firm being in charge of involving and aligning partners, leading them towards novel opportunities as well as ensuring fair value sharing and proper value creation (Altman & Tushman, 2017; Moore, 1996).

### 2.2 Key Aspects of The Attention-based view

Based on earlier work (Cohen et al., 1972; Cyert & March, 1963), Ocasio (1997) introduced an attention-based view of the firm. Attention, “the noticing, encoding, interpreting, and focusing of time and effort” (Ocasio, 1997, p. 189) on issues and answers, i.e. information about the environment and available action alternatives, is seen as one of the most crucial resources in firms (Ocasio, 1997). This is, since actions of decision-makers and the subsequent organizational moves depend on which information they focus their attention on (Ocasio, 1997).

Decision-makers’ attentional capacity is finite and when being confronted with more information than they can process, their attention becomes selective (Cyert & March, 1963). This is both a blessing and a course: It allows the concentration of energy and effort on a limited set of issues and tasks, facilitating speed and accuracy of decision-makers perception and action (Ocasio, 1997). On the downside, it leads to a potential neglect of relevant options, information and decision alternatives (Barnett, 2008).

The focus of attention hinges on the specific situation and the context decision-makers are in (Gavetti et al., 2007; Ocasio, 1997). In this vein, so-called communication and procedural channels play a major role: They are the result of the environmental, organizational, and individual-level setting and form the arena in which decision-makers are confronted with available information and decision alternatives (Ocasio, 1997). These channels can be described according to their spatial (which information is available to whom), temporal (how much time does one have to respond to available information) and procedural (how is available information
being attended to) dimensions (Ocasio, 1997; Stinchcombe, 1986). In practice, communication and procedural channels can be, for instance, meetings, workshops, conferences as well as any forms of written, verbal and technological interaction (Ocasio, 1997).

Besides the focus of attention, regulation of attention plays a significant role within the attention-based view of the firm as well. Since firms can actively shape procedural and communication channels (PCC), they can also regulate decision-makers’ attention (Ocasio, 1997). This can be done by either setting flexible or fixed PCC – Flexibility of attention regulation allows decision-makers to switch easily from one set of information to others. On the other hand, fixed regulation of attention allows for preparatory attention, which increases speed and accuracy of decision-makers’ perception and action (Ocasio, 1997).

Altogether, this chapter highlights several aspects, which are relevant for the further development of an attention-based view of the ecosystem:

1. The distribution of decision-makers’ attention is affected by procedural and communication channels.
2. The channels’ spatial, temporal and procedural dimension affects decision-makers’ focus of attention.
3. Attention can be regulated by either flexible or fixed procedural and communication channels.

3 Methods

As elaborated in the introduction and literature section, the concept of ecosystems is still little known and particularly incomplete and fragmented attention-based view, especially on the question of how to shape procedural and communication channels. Given these circumstances, a case study appears most suitable (Kathleen M. Eisenhardt, 1989). We use a multiple case approach for our research since it allows us to collect comparative data and is likely to provide
more accurate and generalizable insights than a single case (Kathleen M. Eisenhardt, 1991; Ozcan & Eisenhardt, 2009). Further, with many studies in the ecosystem field still being conceptual, the rich empirical insights provided by a multi-case study may be of particular value for the understanding of this rising phenomenon from an attention-based view.

3.1 Data sampling

The sample of our multiple-case study consists of eight cases, which we selected based on several criteria. First, and most intuitive, all cases of our sample need to correspond to the view of the current ecosystem literature. Due to the novelty of the phenomenon, there still exist different views about the ecosystem construct leading to some confusion about the clear identification or delimitation of an ecosystem (Adner, 2017; Jacobides et al., 2018a). Also, it is often challenging to decide whether a particular company is part of the ecosystem or not. We, therefore, relied on the perspective of (Adner, 2017) of an ecosystem-as-structure since it is “more clearly distinguishable from other available strategy constructs” (Adner, 2017, p. 40). Moreover, it does not exclude related ecosystem concepts, which ensures a greater impact of the resulting findings (Adner, 2017). Finally and most evidently, the relevance and applicability of this foundation is demonstrated by recent essential publications on ecosystems (e.g. Jacobides et al., 2018a), which are based on Adner (2017). Accordingly, our definition of an ecosystem is “the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize” (Adner, 2017, p. 42).

Therefore, we based ourselves on three criteria which all of our ecosystem cases and all firms within these ecosystems needed to fulfil. These were derived from Adner (2017), supplemented, and reinforced by Jacobides et al. (2018a) (At the end of our methods section, we describe the ecosystems studied in detail and show their match with these criteria).
1. We identified a fully developed and clearly describable value proposition for the ecosystems’ customer (e.g. product or service).

2. The contribution of the ecosystem partners to the joint value proposition can be (not necessarily all but at least the majority of them) described by modules characterised by non-generic complementarities.

3. All of the ecosystems studied were characterized by multilateral links among the partners. Thus, the interaction across the relationships between the partners is crucial, i.e. they cannot be fully decomposed into independent bilateral relations.

Applying these three criteria, we were capable of clearly identifying companies that can be viewed as or being part of an ecosystem. Thus, companies need to be engaged in multilateral relationships with the other partners, are being aligned towards the value proposition by the orchestrator, have a clearly defined position and role in this regard, and provide non-generic/complementary modules to the value proposition.

The second main criterion for our case choice was the selection of ecosystems “with an understanding of where there was likely to be variation and where there was not” (Ott, Eisenhardt, & Bingham, 2017, p. 86). For instance, we ensured that between the cases there was a certain variety in terms of background, value proposition and the company size of the orchestrator. Moreover, the types of orchestrators in our studied ecosystems were both established firms and spin-offs/ joint ventures as well as start-ups. Additionally, the findings should not be distorted by industry specifics, thus, we ensured to have a variety of industry contexts of the ecosystems (from an ecosystem perspective this refers to different backgrounds of the value proposition, since companies in an ecosystem often stem from different industries). Noticeably the use of cases from very different industry backgrounds was also necessary, due to the relative novelty of the phenomenon also in the practice. It would have been a challenge
to find a sufficient number of cases providing the rich insights needed for the exploration of such a novel phenomenon whilst relying solely on one industry. Therefore, our sample of ecosystem cases encompasses value propositions in manifold fields such as insurance, mobility, logistics, finance, home, and public transportation. Lastly, one indispensable criterion was also the selection of companies only where we had adequate access to managers who were willing and able to provide us with in-depth information about the ecosystem at hand.

Though, our case selection process cannot be regarded as an entirely straight process. In lieu, we used an iterative approach implementing constant adjustments between case selection, data collection, and data analysis (Kathleen M. Eisenhardt, 1989). Our initial set consisted of around 20 short cases of which, based on our sampling criteria, we selected around five as an initial sample. After having conducted the first rounds of interviews and data analysis, we were searching for additional cases to extend and enrich our sample as well as to yield a better understanding of the emerging theory (Kathleen M. Eisenhardt, 1989). Accordingly, we excluded those cases from our sample that proved not to ideally match our criteria but also added further cases, until we reached a state where additional cases no longer significantly enriched the understanding of the context (Kathleen M. Eisenhardt, 1989).

### 3.2 Data collection

Our data collection process was structured along four main steps. At first, we conducted initial interviews with the main contact person of the ecosystem orchestrator, in order to assess whether the structure at hand fulfilled the criteria for our cases and to get an initial understanding of these. Secondly, we interviewed an executive from the orchestrator who should have an excellent overview of the ecosystem. We sketched graphical representations of the ecosystems jointly with our respondents (Dattée et al., 2018). Four researchers, who independently took notes and analysed the information (Mayring, 2007), conducted all interviews. In the third step, we collected extensive supplementary data, which consists of both
external and (orchestrator-) internal documents as well as those provided from third parties about the ecosystem and other aspects, which have been addressed in the initial questionnaire. These documents included press releases, media reports, homepages, annual reports as well as internal presentations and reports. This enabled us to enrich the insights gained during the first interviews and to validate and triangulate them (Jick, 1979). In addition, we were better placed to detect potential inconsistencies between statements from the initial interviews and the internal and external documents.

Thereafter, in order to deepen our existing findings and disentangle eventual inconsistencies or misunderstandings we conducted additional interviews with the orchestrator. Additionally, with some of the companies we conducted workshops enabling us to collect additional information and check for consistency between emerging theoretical constructs and the perception of the practitioners. We then interviewed other actors within the ecosystems to triangulate our findings. Table 1 gives an overview on our data sources per case.

3.3 Data Analysis

Initially, we created individual cases based on our interview transcripts and enriched by our further data sources and follow-up questions (Yin, 2014). We used these individual cases as a foundation for the cross-case analysis, which was initialized with an open mind and without pre-defined constructs or hypotheses (Kathleen M. Eisenhardt, 1989). In detail, we searched for key words in our data referring to PCC and the other key aspects of the attention-based view as described in the literature review. Figure 4 provides an example of our coding procedure.

Moreover, we made use of drawings, tables, and other forms of visualization to gain an overview on our content and detect patterns in our data more easily (Yin, 2014). For the same
reasons, we paired cases in order to understand similarities and differences between the cases (Ozcan & Eisenhardt, 2009). On this basis we developed first constructs in a recursive manner (K. M. Eisenhardt & Graebner, 2007), representing elements of attentional structures as well as surrounding conditions of the ecosystem. Using these constructs and themes, we built first relationships between them (e.g., an ecosystem with many heterogeneous partners seems to imply an orchestrator with a comprehensive overall view). These resulting relations were cross-checked with the other cases in order to verify their occurrence (Ozcan & Eisenhardt, 2009). Two of the three authors of this paper were, independently from each other, involved in this initial analysis and afterwards conducted a discussion as well as synthesis. Our main objective with regard to this first stage of inductive analysis was the search for interesting and relevant constructs and themes. These should be furtherly deepened and extended in the following second stage of research.

As such, we identified three types of communication structure and two distinct types of orchestration, i.e. alignment structure.

In a next step, we conducted a thorough literature analysis on ecosystems as well as the attention-based view of the firm, having a special focus on the theoretical aspects derived from our first round of analysis. This allowed us to go back-and-forth between the literature and emergent theory (Kathleen M. Eisenhardt, 1989; Yin, 2014).

3.4 Overall description of our cases

Table 1 provides a brief case-by-case overview of our cases as a basis for the subsequent derivation of the findings:

<<<Insert Table 1 around here>>>
4 Findings

Our findings are structured around three sections, comprehensively covering all three dimensions of PCCs – spatial, temporal, and procedural (Ocasio, 1997; Stinchcombe, 1986). In the first section, we identify three different types of PCC orchestrators use in order to distribute the attention of the ecosystem partners involved. These types determine which information is available to whom, thus addressing the spatial dimension of PCCs. Also, we show how flexible or inflexible the PCC regulate the attention in our cases, which refers to their temporal dimension. In the second section, we show how the available information is attended to differently depending on the orchestration form, thus addressing the procedural dimension. In the last section, we focus on the implementation of the separation of orchestration, also describing the procedural dimension of PCC.

4.1 Three main types of procedural and communication channels

Regarding the PCC, we identified three basic and polar types in our cases, which we systematically introduce in this section:

Type (A): Focus of attention is unilateral. The orchestrator attends to issues and answers provided by the complementors, thus receiving the information necessary to orchestrate the ecosystem. The complementors receive information from the orchestrator without attending to any information related to the other complementors or the orchestrator beyond of what is being provided by the latter. A sketch of this logic is shown in Figure 1.
Type (B): Each partner communicates with each other and can attend to any issues and answers provided by the actors within the ecosystem if required or desired. This type is shown in Figure 2.

![Figure 2: PCC type B](image)

Typ (C): The orchestrator acts as a bottleneck for information. Instead of allowing direct interaction among the complementors, the orchestrator transfers necessary information from one to another. Thus, complementors can focus their attention on issues and answers provided by the orchestrator only, not on those related to the other partners. This type is shown in Figure 3.

![Figure 3: PCC type C](image)

The PCC type A allows the orchestrator primarily to attend on its own goals without strongly considering the issues and answers of the other actors. The orchestrator only sporadically informs these if necessary due to the business. For instance in the Carsharing ecosystem, the orchestrator has a strong degree of autonomy in aligning the ecosystem and informs the other partners rarely and to a lesser extent.
The same pattern becomes apparent in the Move2 case. A quote of the Key Account manager of Move2 nicely shows the intention to only sporadically exchange information with the partners if necessary.

“So what we're trying to do is actually meet each partner twice a year. [...] So the thing is, the less communication you have with the partners, the better [...]”

This quote appears a bit exaggerated but it clearly shows that the orchestrator in this case wants communication and interaction with the other actors to be as low and target-oriented as possible. Matching this approach, in the Move2 case only two FTE (out of 62 in total) were effectively responsible for the partner’s management and both of them could use their time mainly for other tasks such as the seeking for new opportunities. By using only a minor portion of the FTE’s total attentional capacity for the communication with the other actors, we can speak of an efficient use of the orchestrator’s attention. This is also given in the carsharing case, where only two out of 18 employees are dealing with the tenants and lessors in order to run the ecosystem. Consequently, since the flow of information is rather low and only the information is shared that is necessary to jointly run the ecosystem, this PCC type leads to an efficient use not only of the orchestrator’s but also of the complementors’ attention.

On the downside, complementors cannot attend to any issues and answers of the other complementors, which makes it difficult to share complex or extensive information needed to align different modules or to exchange on opportunities for the future development of the ecosystem. Accordingly, this type was only applied for either running an ecosystem after the value proposition was in place or for ecosystems with a value proposition that does not require extensive mutual adaption of modules. For instance, in the Carsharing ecosystem the platform made an information exchange between private lessors and tenants almost obsolete, let alone additional contributions such as insurance, fuel vouchers etc. by other partners. Likewise, in the Move2 case, where the orchestrator bundled all services of the partners regarding the actual movement, cleaning, the transport and sales process for furniture as well as free and tailor-made
insurance service etc. on its platform and hardly any information exchange between these individual partners was necessary. However, this structure requires a decent inherent power of the orchestrator since it primarily attends its own goals and makes the complementors to accept only sporadically information. In our two cases of structure A, this position is ensured by the contribution of a crucial and hardly fungible module that leads to an indispensable position of the player within the ecosystem. In the Carsharing case, this source of power is represented by the platform, which brings together two central players of the ecosystem, the car lenders and the car renters. In the current state, the ecosystem of Carsharing would fall apart without the platform, which makes the renting platform provider the only single player within the ecosystem, which is indispensable. Similarly in the case of Move2. After the orchestrator has created a platform as a tool to orchestrate the variety of different partners easily, the work of the non-digitized partner firms were significantly facilitated and more importantly, lucrative leads have been generated for them with little effort. The participation in the ecosystem became even crucial for the economic success of key partners, which the CEO nicely explains:

“So we're the core driver of their business. And that gives a certain power.”

Therefore, no player within the ecosystem could threaten the position of the orchestrator. In both of our two cases of structure A, the inherent power is ensured by the platform, i.e. the contribution of a crucial and hardly fungible module that leads to an indispensable position of the orchestrator within the ecosystem.

Regarding type B, the case of Mobility serves as a very nice example. The five key partners meet regularly in the so-called comité opérationnel and openly exchange about current or potential future ecosystem initiatives. The partners share all relevant information as head of the respective ecosystem initiative states:

“Basically all partners always meet and everybody knows every partner and everybody thus exchanges information with every other partner.”
Likewise, in the Access case: On top of the communication where the orchestrator was involved, also the other partners had to communicate without the participation of the orchestrator in order to align their modules as the Chief Sales Officer states:

“So they are communicating bilaterally with each other and have also implemented parts of the value proposition without us being much involved.”

Another interesting example is Move3. In contrast to Move2, the orchestrator does not unwind the communication over its platform in cases which are not close to the actual move. Instead, it gives the lead to another partner which directly communicates and interacts with several other partners within the ecosystem in this case.

This type of PCC contains all issues and answers being relevant for the ecosystem, which makes it necessary for the partners involved to distribute their attention across a multitude of information. However, since the information does not have to pass the orchestrator as a bottleneck, the orchestration per se requires less attentional capacity of the orchestrator. This is particularly true for the mutual adaption of complementary modules: Since complementors can exchange information directly, they do not need to involve the orchestrator if not required. For instance in the Mobility case, the partners assign employees to a product development team, which only involves those partners, which are necessary for the task at hand. Therefore, in both structures B and C the partners intend to extensively exchange information whereas the primary purpose of structure A lies in the standardized management by the orchestrator. However, in such a PCC structure in which all firms extensively and freely communicate with each other, the orchestrator cannot create a situation, in which he is able to withhold information. Also, since all partners can attend to any issues and answers of the ecosystem as well as regarding possible opportunities for future value propositions, everyone can extend the ecosystem or try to steer it into a specific direction. Thus, the orchestrator needs to have an inherently powerful position within the ecosystem as well, since otherwise it could easily be replaced or left behind in case of an extension of the ecosystem. Accordingly, this type is applied by the orchestrators.
in the cases of Mobility, Logistics, Move3 and Access. In the latter case, the power of the orchestrator is a result of the technical expertise and the contribution of the locking system, as the CEO points out:

“By doing the cloud-based locking system and management there, we are relatively firmly anchored in a product that is rolled out”

Regarding Move3, we must consider the parallelism with Move2. The platform of the orchestrator in Move2 facilitates the exchange within the ecosystem in the cases of services close to the move (which occur in most cases). In the rarer cases that are not close to the move (i.e. Move3), the other actors still receive lucrative leads. These additional revenue sources received by partners from the orchestrator, in addition to their normal business, make the orchestrator attractive to the other actors and ensure a strong position in the ecosystem.

A second source of power we identified in our cases is the indispensability or superiority in terms of resource equipment. For instance, Logistics does not provide a central module for its ecosystem but it provides necessary financial funds as well as important contacts to decisive persons. Similarly, in the Mobility case the orchestrator provided financial means as well as important contacts but also knowledge and experience particularly with regard to the processes of public transportation.

Regarding type C, the cases of Move1, Insurance, FinTech and Video serve as nice examples. In the case of Insurance, the main task of the orchestrator was the coordination of an established insurance company and a B2C corporate, which produces physical products. For this purpose an extensive communication is necessary, which in this case runs completely over the orchestrator.

Similarly, in the FinTech case the main purpose of the orchestrator lies in the coordination and communication of the investor, the insurance and the client. The other actors never communicate bilaterally with each other although the shared information needs to be high.
Likewise the Video case, where the publishers require specific videos and information about how to optimize its video appearance for the end-customers and the community of video & product experts needs instructions and guidance by the video company. Thus, the necessary information exchange is high but runs through the video company as a bottleneck. Lastly, in Move1, i.e. the early stage of the ecosystem, the other actors such as the move and cleaning companies required information since there was hardly any technical support or even automation and the orchestrator had to be transparent and build up trust. Noticeably, in all these cases the majority (FinTech, Video, Move1) or even all (Insurance) of the FTE were involved in the communication with the partners and used a significant portion of their capacity for this task. All in all, all cases of structure C are characterized by a flow of information that is rather high and potentially originates from all the actors. These retrieve some degree of information about the other actors, which is necessary for the realization of the value proposition. Noticeably, this is an important similarity to structure B, since in both PCC the degree of information exchange between the actors has to be high in order to materialize the value proposition. Though, from an orchestrator’s perspective its use of attention is not efficient in structure C since as a bottleneck most employees are mainly occupied with the information exchange between complementors.

Thus, an orchestrator does only use this structure if it is required to do so, i.e. it has an inherently weak position. In our cases, orchestrators opting for a PCC with a less efficient distribution of their attention such as structure B had an inherently weak position within the ecosystem. Using the previous logic, weak orchestrators neither provide a crucial module within the ecosystem nor superior resources. For instance, the orchestrator of the Insurance case has by its own assessment only a minor contribution to the final product. Therefore, the other partners potentially always threaten its position. A nice illustration is a quote from the COO of Insurance about openly expressed thoughts of a key partner.
Thus, they take over more effort and prevent through the PCC that without the orchestrator information regarding the alignment of all modules is flowing. In other words, the role as a bottleneck for the exchange of information results in the inability of the other partners to see the big picture. This exclusive position regarding the information exchange within an ecosystem of structure C ensures some degree of indispensability of the orchestrator. The other actors in our cases of structure C simply do not possess enough information to run the ecosystem without the orchestrator. We can observe this pattern nicely in our cases. For instance, FinTech has taken explicit care not to bring the different partners together, as its Head of Marketing states:

“We thought that we would not actually bring people together, because at the beginning we were much more afraid that they could do this business without us.”

Consequently, structure C puts the orchestrator into a structural strong position resulting from its role as an information bottleneck. Therefore, this PCC guarantees a powerful position for the orchestrator but increases the effort of the overall communication, which is primarily bilateral with the orchestrator.

The comparison of the three types of the PCC types reveals a trade-off between structural power and an efficient use of attentional capacity from the perspective of the orchestrator. Hence, when complex or extensive information is shared there is the option to either choose a PCC type such as B and optimize the overall use of attentional capacity, or to maximize the power of the orchestrator resulting from the role as a bottleneck for information such as structure C. Another aspect to consider is the required spread of the partners’ attention for the realization of the value proposition. In structure A, the actions of the complementors are rather standardized and require little information exchange between the actors. Conversely, in structures B and C the actors need to receive and process a considerable amount of information in order to align
their respective module to realize the joint value proposition. Thus, their required spread of attention is high compared to structure A.

Therefore, it is worthwhile to consider which type of orchestrator in our cases designed which type of PCC structure. Usually and according to common sense, each firm would use its attentional capacity most efficiently, if it were in the position to do so. Consistent with our findings, firms choosing PPC type B have an inherently strong position, which allows for a free flow of information between the actors. On the other hand, the orchestrators with a relatively weak position create a PCC type such as structure C that denies the partners the big picture and ensure its indispensability as a bottleneck of relevant information. This observation leads to the following proposition 1:

*The more an orchestrator has an inherently weak position within the ecosystem, the more it sets the procedural and communication channels in a way that allows to limit the attention of the other actors to a small and pre-defined set of issues and answers related to the ecosystem.*

*The more an orchestrator has an inherently strong position within the ecosystem, the more it sets the procedural and communication channels in a way that allows the other actors to freely attend to a large set of issues and answers related to the ecosystem.*

This key relationship is illustrated in Figure 5, in which we embedded our PCC types. Further, the important trade-off from the orchestrator’s perspective between an efficient use of its attention and a structural position of power becomes apparent.

In addition, we observed that in terms of communication Video, Insurance and FinTech had a flexible regulation of its partners’ attention (Ocasio, 1997; please also see Palmié et al., 2016). This means that meetings, calls or other forms of local or distant exchange were not predefined in advance but occurred rather spontaneously when required. In the Insurance case e.g., the orchestrating firm had to establish contact with its partners at short notice and intervals.
In the FinTech case, a similar pattern becomes apparent from the elaboration of the Head of Marketing of the orchestrating firm:

“It's always been as needed. We have tried to keep regular things as little as possible.”

The other cases revealed pre-defined and fixed communication channels, i.e. an inflexible regulation of attention. For instance, in the Logistics case, one orchestrator has a weekly exchange with the another actor as well as regular exchange with the other partners within the ecosystem. Another interesting example would be Mobility, where we can observe a mixture of both a flexible and inflexible PCC. On one hand, the key partners meet several times per year and fixed project-teams for the individual ecosystems are defined. The Head of Open Innovation describes it as following:

“Then there's this Comité Opérationnelle, all the partners are there. That's five, six times a year or so.”

However, beneath this formal structure it is also possible that project managers or team members do approach decision makers of the Comité Opérationnelle outside these meetings on short notice. This fluidity is also increased by the fact that in some other projects project managers were also a member of the Comité Opérationnelle. Besides this informal exchange, which is often the result of personal contacts between individuals, this case also shows the efforts of the decision-makers to primarily use a pre-defined and fixed channel.

This inflexible PCC focuses the attention and thus leads to a more efficient distribution of attention (Ocasio, 1997). Therefore, an orchestrator would manage the orchestration within a predefined and fixed PCC as long as the primary goal is an efficient distribution of attention. For instance, in the Access case, the orchestrator endeavors to organize the exchange with the partners as regularly as possible. Besides, the orchestrator would have chosen an even more inflexible regulation of attention if it could have dictated the rules to its partners:
So let's say if we had so much power now that we were a special interest group [...] we'd be talking in our quarterly meeting and not in between.”

However, a flexible regulation of attention reduces an efficient distribution of attention but broadens the attention of the orchestrator towards the issues and answers of the partners. If their respective agendas are met, these partners are more likely to be satisfied and accept the position of the orchestrator. Arguably, a good service orchestrator that mainly enables the communication within the ecosystem must of course be available whenever necessary. With this, he cannot optimize an efficient distribution of attention if he wants to strengthen its position as orchestrator. Therefore, an orchestrator could be forced to manage the orchestration within a flexible regulation of attention if its focus lies on the maintenance of its position. Derived from this observation, we state the following proposition 2:

The more an orchestrator has an inherently weak position within the ecosystem, the more it sets the procedural and communicational channels which allow for a flexible regulation of attention.

The more an orchestrator has an inherently strong position within the ecosystem, the more it sets the procedural and communicational channels which allow for an inflexible regulation of attention.

Figure 5 provides an overview of these Findings 1 and 2 as well as the basic relationships between the three PCC types.

4.2 Unity or separation of the orchestration function

Whilst the existence of an orchestrator is one of the key characteristics of an ecosystem (Adner, 2017; Jacobides et al., 2018a), this role was shared between different companies in some of our cases. For instance, the logistic company in the Logistics case built the ecosystem by developing a use case, finding the necessary partners as well as clients. However, once the ecosystem was established, the designed PCC made the drone technology provider responsible for the day-to-day business and the communication with the client. Similarly, the drone technology provider
was the main contact point to the governmental authority and took over the major part of the exchange. Therefore, in this case, one player performed tasks that where more long-term oriented and comprehensive, such as setting-up the ecosystem, choosing complementors, developing the business case, whereas another player was responsible for tasks relating to the short-term, specific, and daily operations. This approach enabled the logistic company with only two FTE determined to the project to develop a value proposition in a field that was unrelated to its previous business, as the Programme manager points out:

“We didn't have the knowledge about the drones and of course we didn't know what we could do with them for business yet”

Therefore, in this case one player performed tasks that relate to the strategy whereas another player was responsible for tasks relating to operation. Therefore, we call these two types of orchestration strategic and operational orchestration. Logistics therefore had a clear separation of these two types of orchestration and both functions were executed independently from each other by different firms. Noticeably, this separation creates PCC for a distinct exchange of operational and strategic information.

Contrary, in our cases Carsharing, Insurance, Video, FinTech and Access, we can observe a unity of the orchestration function. For instance, Access had no separation of the orchestration, as the CEO points out:

“The same people are, so to speak, responsible for operational communication with the partner as for strategic communication.”

Thus, the PCC were designed in a way that the respective orchestrator was occupied mainly with operational tasks and acquired knowledge in this area. Furthermore, the product, i.e. the value proposition should be developed path-dependent and only gradually from the existing status quo. Regarding the case of Mobility, several actors are involved in the orchestration of an ecosystem. One key organisation is the so-called comité opérationnel, which was established
as a formal body where the five key partners meet and which is responsible for the strategic and overall decisions regarding the ecosystem. Besides this powerful orchestrating body, also a second layer of decisions is located at the project-level of each ecosystem initiative.

“This actually means that when a project is made, a group is formed, a project group, which is then simply put together. [...] At this project level, it is a matter of operational exchange.”

Therefore, in the Mobility case not individual firms were responsible for the orchestration but rather inter-firm bodies, which consist of representatives of several ecosystem actors. In order to create a link between the two layers, the project managers occasionally presented the operational status-quo updates. Further, several members of the comité opérationnel were very much involved in detail into the projects, as the Head of Open Innovation explains:

“There are usually also some members of the Comité Opérationnelle who are responsible for or affected by these projects as project managers. They then observe what happens in the project and exchange information accordingly.”

This clearly shows that the decision-makers in the Mobility case endeavor to design the PCC to ensure a close connection between the operational and the strategic orchestration function. Interestingly, ideas for new value propositions, i.e. new ecosystems (Adner, 2017), emerged from the circle of orchestrators:

“Ideas for projects come from the circle of members of the Comité Opérationnelle or from creation workshops where the members invite external persons from their business network.”

Thus, similarly to the Access case, the actors develop a value proposition in fields related to their existing business and where they have prior knowledge. We can observe this pattern also in our other cases with a unified orchestration such as Carsharing, Insurance, Video and FinTech, where the development of the initial value proposition was strongly determined by the already existing modules in related fields. Therefore, the strategic direction of the orchestration and thus the ecosystem itself are path-dependent and follow the direction of the operational orchestration. This logic coincides with the stance of prior works on the attention-
based view and related theoretical works (Cyert & March, 1963) that attention is directed towards fields where prior related knowledge and experience is available. Therefore, if the orchestrator does not intend to scale the ecosystem path-dependent and rather extend the value proposition by the addition of new modules in unrelated fields, it needs to separate the operational from the strategic orchestration. Move1, Move2 and Move3 provide another excellent example for this logic. In the beginning of Move1, the orchestrator performed both types of orchestration. Consequently, the ecosystem grew into fields that were related to the already existing ones.

Once the company has created its platform and the case turned to Move2 and Move3 respectively, the operational alignment was reduced to negligible effort. Therefore, in Move2 and Move3, some employees of the orchestrator were not occupied with the operational steering of the partners anymore. Thus, in this case, they could almost entirely focus on the strategic orchestration of the partners. As the Head of Business Development joined, he was capable of exploring new opportunities for the business without being pre-occupied by the operational necessities. This spare capacity due to the lack of operational necessities is also supported by the description of the Key Account Manager, who was also involved in the unbiased search for potential partners, i.e. new modules for the existing ecosystems.

Therefore, in Move2 and Move3 we can also observe a separation of strategic and operational orchestration that creates PCC for a distinct exchange of operational and strategic information, this time within the same company. Consequently, the orchestrator was capable of broadening its attention into previously unrelated fields. This led to the integration of entirely different modules and expanded the value proposition with new aspects.

These findings lead to the following proposition 3:

*The more the ecosystem is intended to grow into novel fields by adding new modules to the joint value proposition, the more the orchestrator sets procedural and communication channels that
allow for a clear separation between issues and answers related to the strategic and operational orchestration of the ecosystem.

The more the ecosystem is to grow along the existing path by maintaining/ slightly adjusting the joint value proposition, the more the orchestrator sets procedural and communication channels that do not separate between information related to the strategic and operational orchestration of the ecosystem.

Figure 6 depicts this logic. Importantly, within all of our PCC types an orchestrator could separate the orchestration function. One result from the choice whether to separate the orchestration or not is the degree of information exchange between the actors. A unified orchestration increases the information per channel since there is a central contact person for all strategic or operational issues.

4.3 Determination of the operational orchestrator

This section is devoted to the implementation of the separation of the orchestration. In detail, we analyze which player takes over the role as operational orchestrator.

In our cases, we identified two main types of operational orchestrators. These can be derived from the respective requirements in the cases. For instance, in the Move2 case there are a large number of partners, which stem from very different industries such as relocation, insurance, cleaning, retail or banking. The orchestrating firm does not provide a central module but is mainly aligning all the other modules of the ecosystem towards the joint value proposition for the customer. However, Move2 is the only player that has a comprehensive overview over the ecosystem and information about the different partners.

Likewise, in the Insurance case. Having two partners from very different industries such as insurance and manufacturing, it is the major task of the orchestrator to understand both partners and steer the operational activities within the ecosystem. As the COO states, the orchestrator does not contribute a major module – 70% of the value proposition is contributed by the
manufacturing partner – but they act as an active link between the two partners. The last case, which follows this logic, is FinTech. The partners are in the insurance and banking industry as well as a variety of small and medium enterprises from various other industries. The orchestrator, i.e. FinTech, is the only player that has the big picture of the ecosystem and understands every partner, as the management designed a PCC type that did not bring all the partners together and limit the flow of information between them.

Our other cases are characterized by a rather small ecosystem and consist of more or less similar partners with coinciding agendas. This is nicely shown by the Logistics case. Besides the logistic company, only the drone technology provider and to a lesser extent the governmental authority and the hospital are part of the ecosystem, and their respective agendas are congruent. Therefore, the operational orchestration is left to the player that contributes the most significant module, as the programme manager explains it:

“The drone technology provider has spent most of the resources or time. So I would say the contribution is probably about 50 percent of the drone technology provider. [...] our role is more that of an enabler.”

In this case, the partner with the most significant module is the operational orchestrator since it has to focus its attention on the other modules as well as their alignment with its own module. Besides, all the other partners and their respective module must be aligned towards the central module. This provides the firm with the most significant module the most information interfaces about the partners, putting it into the position to be the natural orchestrator. We can observe this pattern in the cases Carsharing, Access and Video as well. For instance, in the Carsharing case, the orchestrator runs the platform in order to orchestrate car lenders and lesser, which makes its contribution to the ecosystem crucial. As the CEO explains:

“And the most important player is actually us as a platform. One could perhaps say that together with car rental companies and car rental companies we have perhaps ninety percent of the value proposition. And all the others could be replaced.”
Likewise, in the Video case. The central module can be considered as the database that contains all the videos as well as the information and retrieved data from these videos. Lastly, in the Access case the orchestrator provides the technology of the cloud-based locking system. Within the ecosystem of the software provider, hardware provider and mobility service providers, Access has one of three essential modules and probably also the module, which is very strongly specified and has the most connections to all the others

“The solution we have today cannot be achieved without the three modules. [...] In terms of importance, we’d probably be at around 50 percent.”

Therefore, in our cases the allocation of the operational orchestrator role is determined by the nature of the partners within the ecosystem and the diversity of their industries and agendas. Coinciding to theory, every partner within the ecosystem has its own agenda (Jacobides et al., 2018a). Therefore, the orchestrator needs to understand these and make decisions that take into account the agendas of all partners. Thus, the orchestrator must create a PCC that allows for focusing its attention towards the partners and acquire prior knowledge about them. Naturally, this task becomes harder with the increasing size and heterogeneity of an ecosystem. In these cases, the orchestrator needs to focus its attention in order to gain diverse information as well as a comprehensive overview about the ecosystem.

These observations lead to the following proposition 4:

*The more and heterogeneous partners an ecosystem has, the more the operational orchestrator needs to be a firm being able to focus its attention on issues and answers from a multitude of fields.*

*The more homogeneous and/or the fewer partners an ecosystem has, the more likely the partner is to be the operational orchestrator making the greatest contribution to the VP or the core module of the joint value proposition.*

Based on these propositions and given a pursued separation of the orchestration, a strategic orchestrator needs to assess whether based on the contingencies of the ecosystem and his own capabilities it should also have the operational orchestration function within the same firm or give the role to another party. In other words, the orchestrator has to consider if it can focus
attention on relevant operational issues and answers. In the case of Move2, the operational orchestration has been largely automated by the implementation of a platform tool, which enabled the orchestrator to pursue the separation within the same company. In contrast, Logistics felt that another player would be better fit to fill out this role. Intuitively, the use of the strategic orchestrator’s attentional capacity, i.e. the capacity of its FTE, is more efficient if it can outsource the operational orchestration to another firm. Figure 7 provides an overview of this logic as well as Findings 4.

Noticeably in our cases, an orchestrator never delegated the strategic orchestration to another partner. This appears intuitive, since the strategic governance and alignment of the partners lies at the very core of the orchestrating function, thus giving up the strategic orchestration would bring the orchestrator into an obsolete position.

5 Discussion and implications for research

In the following chapter, we are discussing our empirical findings and propositions and show their contribution to existing literature and potential pathways for future research on ecosystems (Adner, 2017; Jacobides et al., 2018a).

With our first proposition, we show that the design, especially regarding their special dimension (Ocasio, 1997), of the procedural and communication channels (PCC) regulating the information exchange between the partners in an ecosystem is primarily determined by whether the orchestrator contributes a central module or indispensable resources or not. Prior works on ecosystems, such as Alexy, George, and Salter (2013) and Brusoni and Prencipe (2013) have analyzed how knowledge sharing affects the strength of inter-firm relationships and thus the development of the ecosystem. However, “the mechanisms of how hub firms manage knowledge mobility have rarely been studied (for exceptions, see Azzam et al., 2016) and
empirical support remains limited even within these studies” (Jacobides et al., 2018a). Our proposition 1 addresses this call for research. We show for our cases that the orchestrator steers the ecosystem partners by distributing or withholding information, thus shaping the attention of the actors within the ecosystem. If an orchestrator holds a strong position within the ecosystem, it can create a PCC to ensure a free flow of information between the partners. Thus, if a firm intends to benefit from information exchange and learn from other partners, it shall engage in an ecosystem with an inherently strong orchestrator.

Our second proposition sheds light on the explicit design of PCC by the orchestrator in order to regulate the attention of the ecosystem actors. In our cases, the design of these channels depends on the inherent power of the orchestrator. The existing literature on ecosystems has discussed whether formal mechanisms and rules are being used by the orchestrator to steer ecosystem members (e.g. Alexy et al., 2013; Baldwin, 2012; Brusoni & Prencipe, 2013; Gulati et al., 2012; Teece, 2016). Our findings specify these results.

Our proposition 3 discusses a largely under-researched topic: The role and disparity of orchestrators. Previous literature has agreed upon the existence of an orchestrator to be one of the key characteristics of an ecosystem, but the question whether and under which circumstances several players might act as an orchestrator remained vague (Adner, 2017; Altman & Tushman, 2017; Jacobides et al., 2018a). According to our cases, the intended growth direction proved to be a decisive factor, which determines whether a separation between an operational and a strategic orchestrator is beneficial, or not. Specifically, our ecosystem cases Move2, Mobility and Logistics, which are characterized by such separation primarily focused on the expansion of the joint value proposition by adding previously unrelated modules. Thus, the freedom with regard to operational steering necessities was a decisive factor to be able to develop unbiased in new directions on a strategic level.
The third proposition also delves deeper into the distribution of the partners’ attention, i.e. the management of the actors within the ecosystem. Although several authors have considered the steering of the partners by the orchestrator to be a key characteristic of ecosystems (e.g. Alexy et al., 2013; Baldwin, 2012; Brusoni & Prencipe, 2013; Teece, 2016), the topic of alignment has not been comprehensively studied (Brusoni and Prencipe (2013) mention the term “strategic and operational” to describe the tasks of the orchestrator but did not go into more detail). With our findings, we open this blackbox and illustrate two types of partner management. In our cases, the operational and strategic orchestration has been separated either between two firms or within the same entity. This subdivision and specification of the orchestrating function is a significant contribution to literature, since these propositions provide a better understanding of the structure and governance of ecosystems, hence providing “a clearer sense of how ecosystems are structured and governed” (Jacobides et al., 2018a).

However, the differentiation into strategic and operational orchestration opens up a number of further research questions to understand the phenomenon better: How do strategic and operative orchestrators cooperate? How are the potentially conflicting agendas of them managed? How do the orchestrators and their relationship to each other evolve over time? And, if the separation of the orchestration is organized within the same firm: Which employees or departments should be assigned with the strategic or operational orchestration? Which other mechanisms are used for the separation of the orchestration function within the same firm other than between firms?

The proposition 4 similarly addresses the profile of the orchestrator, specifically which player should act as an operational orchestrator. Thus, they can be considered as an implementation of the separation of the orchestration, i.e. proposition 3. Previous research stated that orchestrators are either established companies providing crucial resources and commercial infrastructures (e.g. Clarysse et al., 2014; Zahra & Nambisan, 2012) or being a player that, at least, uses smart power, problem framing or informal authority (Brusoni & Prencipe, 2013; Gulati et al., 2012).
Our findings specify these claims in terms of the operational orchestrator. Specifically, we identify the type and quantity of the partners within an ecosystem to be the key factor determining the ability of the strategic orchestrator to focus attention on relevant operational issues and answers, thus the choice of the operational orchestrator. Whereas in homogenous and relatively small ecosystems the partner with the most significant module fulfills this role, in our cases with more heterogeneous partners the player with the best overall view takes this part. This identification of the type and quantity of partners as a major contingency for the determination of the operational orchestrator is a significant contribution to the ecosystem literature; since it provides a partial answer to the question if “the mechanisms governing the ecosystem change as a function of the shifting nature of modularity, of complementors, or other factors” (Jacobides et al., 2018a).

Similarly, to proposition 3 these findings are ecosystem specific as the function of an orchestrator is distinctive for an ecosystem (Adner, 2017; Jacobides et al., 2018a). In order to understand these orchestrating mechanisms better, we need to answer several important questions in future research: Does the role of the operational orchestrator shift over time to other partners when the ecosystem evolves to a more heterogeneous nature? Are there situations, in which also the role of the strategic orchestrator shifts over time (willingly or unwillingly) to other partners?
6 References


# Appendix

## Exemplary Coding Scheme

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<th>2nd order concept</th>
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<td>&quot;The solution we have today cannot be achieved without the three modules. By doing the cloud-based locking system and the management there, we are relatively firm anchored in a product that is rolled out.&quot;</td>
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**Figure 4: Exemplary coding scheme**
Figure 5: Overview Findings 1 and 2
Figure 6: Overview Finding 3
Figure 7: Overview Finding 4
Figure 8: Comprehensive Framework of our findings
## Case and data overview

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* Interview general on ecosystem activities, respective case mentioned.