ABSORPTIVE CAPACITY AND NETWORK ORCHESTRATION IN INNOVATION COMMUNITIES

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Abstract

The most loosely coupled forms of innovation networks, innovation communities, may not be manageable in the traditional sense. Rather, they may require orchestration characterized by discreet guidance and supporting structures for improved innovation performance. In this, mechanisms such as knowledge mobility, network stability, and innovation appropriability are often highlighted. While innovation performance naturally depends on a variety of factors that can be orchestrated relying on these mechanisms, in this study we assert, in particular, that through exploiting these mechanisms, it is possible to influence the absorptive capacity at the network level. This may be highly relevant considering that there has been a shift from inter-firm competition towards competition between networks of organizations. Nevertheless, different contingencies may affect the possibilities to rely on orchestration mechanisms for development of potential, realized, and relative absorptive capacity. These issues are examined through literature review and a case study. The findings suggest that individual orchestration mechanisms may be more closely connected to certain contingencies than others, and that both orchestration mechanisms and contingency factors have a role in absorptive capacity development.

Keywords: innovation network, innovation community, absorptive capacity, network orchestration

Competitive paper

Introduction

Innovation networks have been increasing their importance during the recent years (Rosenkopf and Tushman 1998; Chesbrough, 2003; Caloghirou et al., 2004; Adner and Kapoor 2010). The benefit from these networks comes from controlling the risk related to uncertainty inherent to creating something new and commercializing the outcomes of these activities, as well as from being able to combine intellectual assets from various sources, which is a prerequisite for innovation creation (Cohen and Levinthal 1990; Crossan and Inkpen 1995; Pisano and Verganti 2008). However, there are also several challenges related to these networks, management issues among them.

It is often suggested that the characteristics of innovation networks limit the degree to and ways in which they can be managed (Möller and Rajala 2007; Tikkanen and Renko 2006; Dingledine et al. 2003). A network that generates innovation is likely to be characterized by a high level of ambiguity and low level of determinance, especially if engendering emerging, radical innovation is of concern (Augier and Vendelo 1999; Möller and Rajala 2007). In particular, the "fuzziest" forms of innovation networks, the informal innovation communities (Pisano and Verganti 2008; von Hippel and von Krogh 2003; von Krogh et al. 2003) can be quite challenging in this respect. In loosely coupled systems, it may be hard to identify the network actors, and determine what kind of knowledge needs to be imported in the innovation process or when and where an innovation is generated (e.g., Arrow 1974). On the other hand, such informal community-like networks based on voluntary work can be very valuable sources of innovation particularly from the business point of view (Büchel and Raub 2002; Rosenkopf, Metiu and George 2001; Rosenkopf and Tushman 1998; Akera 2001). Without any kind of organizing and steering of the network, such potential can go unnoticed or be lost. While traditional forms of management might not be feasible, orchestration, that is, discreet direction of the network based on knowledge mobility, network stability, and innovation appropriability can become highly significant in innovation generation (Dhanaraj and Parkhe 2006).

Orchestration can promote one essential part of innovation generation in networks; absorptive capacity (ACAP) at the network level. ACAP refers to organizational capability for knowledge acquisition, recognizing the value, assimilation, transformation and exploitation (Cohen and Levinthal 1990; Zahra and George 2002; Todorova and Durisin 2007; Peters and Johnston 2009). In prior studies, it has been established both theoretically and empirically that absorptive capacity is positively related to innovation performance of firms (e.g., Escribano et al. 2009; Fosfuri and Tribó 2008; Hurmelinna-Laukkanen 2012). ACAP can take different forms (Lim 2009) and exist on multiple levels. Most studies view it as a firm-level construct, but we approach it as a network-level construct (see also Peters and Johnston 2009). Following prior studies, we divide ACAP into different dimensions for closer examination. Potential and realized ACAP (Zahra and George 2002) have been identified as relevant parts of ACAP in many occasions. Taking ACAP to network level, relative absorptive capacity needs to be considered as a third dimension (Peters and Johnston 2009).

In this study, we examine the effects of network orchestration on absorptive capacity in the context of perhaps the vaguest form of innovation networks, the *innovation community* (e.g. Pisano and Verganti 2008). Innovation community can be defined as a loosely-coupled system driven by voluntariness, professional ambition and identity (Wenger 1998; Brown and Duguid 2001), and individual aims. Our aim is to increase understanding of *how network orchestration influences absorptive capacity (ACAP)*. The relationship hardly is straightforward, and therefore, we augment our research question to include *how different contingency factors (especially regimes of appropriability, social integration and power relationships* (Todorova and Durisin 2007; Peters and

Johnston 2009)) *relate to this*. While orchestration is more about different activities that can promote ACAP, contingency factors arise from the environment and need to be acknowledged in the endeavor of steering the network and improving the network level ACAP. We suggest that analyzing ACAP in this specific context will facilitate the theory construction of ACAP in an innovation network context, *advancing the so far scarce discussion of ACAP on the network level* (Peters and Johnston 2009; Todorova and Durisin 2007).

The study approaches these issues first theoretically, and then empirically with a single case study of the global Mobile Monday network. MobileMonday™ (MoMo) is an international, open community platform of mobile industry visionaries, developers, and influential individuals fostering brand neutral cooperation and cross-border P2P business opportunities. The empirical analysis of orchestration mechanisms and contingency factors with respect to ACAP development in this specific innovation community is followed by a review of those factors influencing different dimensions of ACAP. Conclusions summarize the findings, introduce the theoretical and managerial implications, acknowledge limitations, and suggest directions for future research.

Absorptive capacity – dimensions and role in innovation networks

Innovation community as one type of innovation networks

Innovation network characteristics determine who may undertake innovation activity and prevalent issues to be addressed. For example Pisano and Verganti (2008) present a typology of innovation networks based on how open or closed the collaborative network is, and on how flat or hierarchical its governance structure is. This leads to four forms of innovation collaboration: An elite circle (closed and hierarchical), an innovation mall (open and hierarchical), a consortium (closed and flat network), and an *innovation community* (open and flat network). Similar to innovation community, Powell and Grodal (2006) define highly fluid and informal "Scientific Invisible College", characterized by shared motivation in the network.

In the present study the context in focus is a kind of innovation community network where participating is easy and anybody may propose problems and solutions (Pisano and Verganti 2008; von Hippel and von Krogh 2003; von Krogh et al. 2003). Innovation communities are loosely-coupled systems characterized by voluntariness, professional ambition, common identity (Wenger 1998; Brown and Duguid 2001), and individual aims. Such networks are very different from strategic innovation coalitions that are formed by strong hub organizations and target efficient processes (Möller and Rajala 2007).

One manifestation of the importance of innovation communities is increased interest in "open innovation" approach that emphasizes the potential of organizations to utilize innovative ideas from many sources, including unexpected ones (Chesbrough 2003; Caloghirou et al. 2004). The open innovation model empowers different stakeholder groups to participate in the innovation process, potentially producing numerous ideas (Pisano and Verganti 2008). Innovation communities often cross national boundaries and this further facilitates utilization of knowledge assets widely (Zahra and George 2002; Martin and Salomon 2003). This confers notable benefits as innovation is often based on novel combinations of existing knowledge (Cohen and Levinthal 1990). However, such an approach also brings along complexity and challenges (Davenport at al. 1999; Moenaert et al. 2000). For instance, the willingness and ability of network members to exchange knowledge and to participate the joint innovation activities may be affected. Therefore, factors such as the absorptive capacity need to be actively promoted within the network.

Absorptive capacity (ACAP) in innovation communities

Absorptive capacity is "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends." (Cohen and Levinthal 1990, p. 128). Hence, ACAP can be seen to cover all capabilities influencing an organization´s knowledge exchange and adaptation. Organizational absorptive capacity is not simply the sum of the organization's employees' capacity to gain new knowledge. As it is to a large extent also an ability to utilize knowledge, it does not simply depend on the interaction with the external environment either, but is also dependent on the transfer of knowledge across and within sub-units of the system. Indeed, absorptive capacity is required at multiple levels so that learning can take place in organizations and networks and so that innovations can emerge (Cohen and Levinthal 1990; Klavans and Deeds 1997; Zahra and George 2002; Peters and Johnston 2009).

Zahra and George (2002) divide absorptive capacity into four dimensions: *acquisition, assimilation, transformation and exploitation of knowledge*. Todorova and Durisin (2007) add *realizing the value of new knowledge* to this list. Zahra and George (2002) further group the dimensions into two components both required for improved performance (Hurmelinna-Laukkanen 2012). The first, *potential absorptive capacity* (combining knowledge acquisition and assimilation), reflects the ability to identify needed knowledge (acquisition), and the processes and routines that allow analysis, processing, and understanding of the acquired knowledge (assimilation) (Zahra and George 2002). This forms the basis for capability development. The second, *realized absorptive capacity* refers to the ways in which external knowledge is applied and exploited. It is based on the ability to utilize knowledge in operations in which organizational culture, structure, and routines are important (Zahra and George 2002; Tu et al., 2006). In networks, these two forms of ACAP are accompanied with *relative absorptive capacity* (Peters and Johnston 2009; Dyer and Singh 1998; Lane and Lubatkin 1998; Van den Bosch et al. 1999). Relative absorptive capacity highlights the two-directional approach to learning and knowledge transfer (Lane and Lubatkin 1998). Therefore, knowledge type and environment, partner specificity, and the related relationship choices made by network actors cannot be overlooked.

A look at the dimensions of absorptive capacity makes it evident that ACAP builds both on the existing knowledge base and external connections (Dierickx and Cool 1989; Cohen and Levinthal 1990; Lim 2009). What can be learned is always subjective to existing knowledge and connectedness of the system to new knowledge sources. Knowledge that is too far away from the existing knowledge base is easily ignored (Cohen and Levinthal 1990, 136; Lane and Lubatkin 1998). In addition to prior related knowledge, effective organizational routines, and communication have been identified as major constituents of absorptive capacity (Cohen and Levinthal 1990, Zahra and George 2002). Therefore cultural and language issues, among others, play a relevant role in international networks (Davenport et al. 1999).

Thus, there are multiple issues from the type of knowledge to the willingness of the organizations to share and receive knowledge that can have an effect on ACAP. While there are issues that may be out of control of the organization or network that tries to exploit external knowledge assets, this also means that it can be actively promoted by manipulating those areas that are known to have an impact. Orchestration of the innovation network can be relevant in fostering absorptive capacity at network level.

Orchestrating innovation networks

Premises of orchestration

While the benefits of collaboration in networks in generating innovations are evident, how these networks are best "managed" or "orchestrated" still remains unresolved. A concept that has emerged to emphasize new forms of leadership needed in managing in networks is network orchestration (e.g., Dhanaraj and Parkhe 2006; Ritala et al. 2009). "It refers to activities that enable and facilitate (but do not dictate) the coordination of the network and the realisation of the innovation outputs. In this context it is not about leading or directing the network, but more a question of discreetly influencing other firms and making sure that the premises for knowledge exchange, value creation and appropriation, and innovation are in place" (Ritala et al. 2012, p. 325). This discreet influence, orchestration, can be done by facilitating three main areas: knowledge mobility, network stability, and innovation appropriability (Dhanaraj and Parkhe 2006). In addition, orchestration can include agenda setting, mobilization of network actors, and coordination including establishing goals, schedules, and responsibilities (Hurmelinna-Laukkanen et al. 2011). However, in order to avoid too much complexity, in this article we will focus on three first mentioned dimensions of orchestration, that are also the ones most closely related to absorptive capacity. These orchestration mechanisms deal with the attributes of the innovation activities, of the knowledge resources needed in them, and of the actors in the network.

Facilitating knowledge mobility

Knowledge mobility can be defined "as the ease with which knowledge is shared, acquired and deployed within the network" (Dhanaraj and Parkhe 2006, p. 660; see also Doz 1996; Nonaka 1994; Parolini 1999). The potential of innovation networks to become a source of value for its members is based on independent actors possessing diverse knowledge assets that can be used to generate novel, innovative combinations (Crossan and Inkpen, 1995, Kogut and Zander, 1996). In order to realize this potential, efficient exchange of knowledge and is needed (see Moenaert et al. 2000). Therefore, the endeavors of the orchestrator need to be targeted to related tasks.

In relation to knowledge mobility, the nature of the knowledge (i.e., tacitness/ codifiability), causal ambiguity (characteristic to innovation activities), and actors' willingness to share knowledge are relevant factors. Causal ambiguity is closely related to the nature and form of knowledge, as it can make knowledge transfer more challenging (Strang and Still, 2006). An example of causal ambiguity would be that – especially considering the fuzziness of innovation activities – it may be difficult for a network member or orchestrator to understand what knowledge might be needed from the network actors, or what kind of knowledge they possess in the first place. In such a situation, building a multi-layered network in variety of geographical and expertise areas to find the right contacts for right purposes is needed. Facilitating explicit knowledge sharing and encouraging documentation in its different forms (e.g., online platforms and communities, common websites) then promotes knowledge mobility within the network (see, e.g., Moenaert et al. 2000). In addition, facilitating the formal and informal knowledge exchange in variety of forums helps in creating novel combinations of people and knowledge (Kale et al. 2000), thus, innovations.

Promoting network stability

While stagnation hardly is beneficial for innovation networks, stability is needed: An unravelling network is not conducive to value creation or value extraction, and lack of cohesion creates challenges (Dhanaraj and Parkhe, 2006; Van der Valk et al. 2010; see also Håkansson and Johanson 1992). Long-term relationships and related bonds between network actors are natural elements of network stability. Bonds are formed at several levels and the orchestrator can facilitate this process by encouraging actors to additional collaborative endeavors. The other side of the issue is that the

orchestrator should try to maintain an adequate diversity in the knowledge pool which is needed in facilitating creativity in the network. The orchestrator may even "step aside" at some point and let some other actor take care of the orchestration (see Davis and Eisenhardt 2007).

In facilitating network stability, common identity among actors should be strenghtened (Dyer and Nobeoka 2000), including improving the common image and/or common vision of the network, or by emphasizing the expected future benefits (Dhanaraj and Parkhe 2006). The more strongly the actors identify themselves as members of the network, the stronger is the basis for trusting relationships. Especially related to voluntary-based innovation communities, meaning of reputation, trust, reciprocity, and mutual interdependence are often highlighted (Larson, 1992, Turnbull et al., 1996, Dingledine et al., 2003) as relevant constituents of stability-facilitating voluntary collaboration (see, e.g., Pleschak and Stummer, 2001). Trust is often challenged in innovation networks, since the kind of communities political processes related to innovation in question can be a disruptive (Koch, 2004). This is often based on distinguished motivations behind organizations participating the network, on the issue of who should dominate the network, or on plain cultural differences in conducting cooperation (Moenaert et al. 2000). These issues are related to the third area of orchestration: maintaining potential for appropriability.

Fostering innovation appropriability

Innovation appropriability in innovation networks means enhancing the commercial exploitation of knowledge and innovations by preventing valuable knowledge from leaking to rival networks or companies (Hurmelinna-Laukkanen and Puumalainen, 2007; Heiman and Nickerson, 2004). It is also about fair distribution of results among the actors. Both of these are important for maintaining the meaningfulness of participating the network: many network actors are worried about knowledge spillovers (e.g., Baughn et al. 1997, Norman 2002, Helm and Kloyer 2004, Bönte and Keilbach, 2005). If these kinds of concerns hamper possibilities or willingness to share knowledge in the network, network success may be compromised (Larsson et al., 1998).

Innovation appropriability as an orchestration mechanism involves both institutional (e.g., contracts, IPRs) and social (e.g., trust) issues (see, e.g. Blomqvist et al. 2005). Activities and tools aiming at knowledge protection should not hamper the development of trusting and reciprocal relations. In fostering appropriability, orchestrator can provide assistance by facilitating safe knowledge sharing within the network (Hurmelinna-Laukkanen 2012), and searching for ways to prevent unintentional knowledge flows outside the network. In the international context, familiarizing oneself with different legal systems is needed, not to mention cultural variation (Rapp and Rozek 1990; Nair-Reichert and Duncan 200; McConnaughay 2000). Sustaining fairness in decision processes is relevant as well (Moenaert at al., 2000, Dhanaraj and Parkhe, 2006). In innovation communities, the orchestrating actor faces many challenges in optimizing the suitable balance between institutional and social governance.

On contingency factors in orchestration and development of absorptive capacity

We acknowledge that the mechanisms, activities, and success of orchestration depend on the environment within which it is carried out, and that the factors arising from the environment also relate to the development and levels of absorptive capacity at the network level (see Fisher 1998, Todorova and Durisin 2007). Many contingent variables identified in prior literature relate to uncertainty, technology and interdependence, industry and firm, competitive strategies or observability (Fisher 1998, Hambrick and Lei 1985). Prior research has provided evidence on the importance of contingencies in relation to potential, realized, and relative ACAP. For example, it has

been noted that ACAP (in general) depends on issues such as the specific type of new knowledge transferred between organizations, the similarity between organizational structures, and familiarity with each other's operating environment and the related challenges (e.g., with regard appropriability issues) (Dyer and Singh 1998; Lane and Lubatkin 1998; Van den Bosch et al. 1999, Todorova and Durisin 2007). Zahra and George (2002) identify social integration mechanisms and appropriability regimes as the contingency factors that are most relevant in relation to absorptive capacity. Todorova and Durisin (2007) add to this, after a careful evaluation, power relationships.

Social integration mechanisms that "build connectedness and shared meanings, influence all processes of knowledge absorption" (Todorova and Durisin 2007, p. 781; see also Powell and Grodal 2006; Granovetter 1973 on weak and strong ties). *Appropriability regimes* relate to the conditions under which knowledge and innovations are protected against imitation, environmental factors to which organizations react according to their possibilities (see, e.g., Teece 1986). Therefore, prior research has highlighted appropriability regimes as relevant contingencies (Zahra and George 2002). Finally, *power relationships* are often based on the influence and position actors hold based on their connections to others, likewise their other resources. Those can enhance actors´ view on innovation possibilities and further innovation implications (Todorova and Durisin 2007; Peters and Johnston 2009.)

However, it may not be clear to what extent the contingencies relate to ACAP development, especially considering the phenomena at network level. Little knowledge exists on the issue which contingencies play a role with regard different network orchestration mechanisms, for example. In the following, we examine through a case study if the above mentioned, or some other contingency factors play a role with regard orchestration and network level absorptive capacity. The theoretical framework of the study is presented in the following illustration (Figure 1).
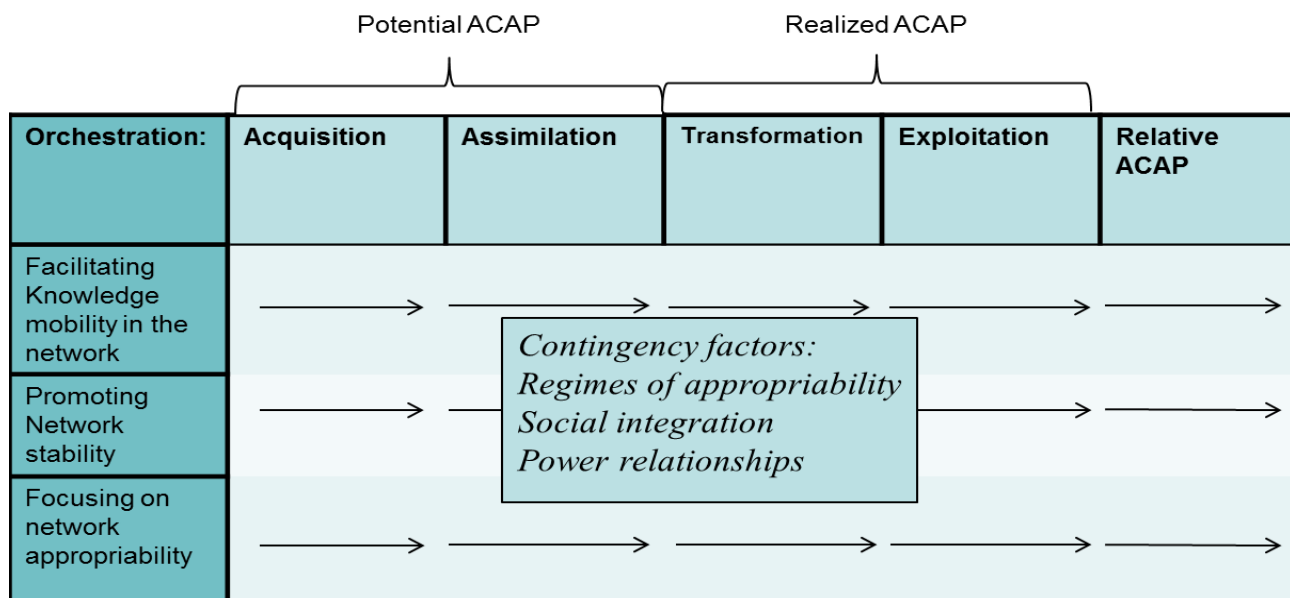

Figure 1. Theoretical framework of the study

Methodological choices and collection of data

A qualitative case study strategy with in-depth analysis was considered suitable for this study for its multi-dimensional nature. This approach can be seen as appropriate as it allows gaining insights into a relatively poorly understood and newly emerged phenomenon (Perry 1998; Eisenhardt 1989). The

global Mobile Monday (MoMo) network was chosen as the case for this study. It has been established for some time already, and is increasingly popular, internationally operating network that has some quite unique features that match well recently-emerged forms of innovation communities. This makes it a demonstrative case for the purposes of this study.

Mobile Monday was launched when a group active in the mobile industry invited colleagues to an informal meeting in Finland in 2000. This led to meetings held on the first Monday of each month. Mobile Monday´s mission is to facilitate innovativeness and networking within the mobile sector. This is done through enhancing cooperation between small and large companies, between local and global actors and people from different backgrounds and with variety of expertise. Since 2004 activities have spread to the international level and enthusiastic and dedicated volunteers had established new network cells, "chapters" in Tokyo, Silicon Valley, in Rome and in Milan. When the data used here were collected (2008-2009) 67 chapters existed, but the network is growing fast and now includes well over 140 cities. According to our view, Mobile Monday well represents earlier defined innovation community since it is strongly based on voluntary communication, there are more and less well-defined goals regarding innovation, different types of knowledge are utilized, and the ties between actors are very specific to Mobile Monday. Also the MoMo members and leaders take this approach as they define MoMo as an "open community platform of mobile industry visionaries, developers and influential individuals fostering brand neutral cooperation and cross-border P2P business opportunities through live networking events to demo products, share ideas and discuss trends from both local and global markets." (www.mobilemonday.com).

The data comprises interviews of thirteen people involved in MoMo activities and some additional data from web pages, print media, as well as material from Mobile Peer Awards meeting in Barcelona in 2009, and regular MoMo meetings. The coordinators and a founder member of the original Mobile Monday, and chapter organizers of ten chapters around the world (Helsinki, New York, Washington DC, Vancouver, Tokyo, Oslo, Hanoi, Munich, Bangalore and Jakarta) were interviewed using a semi-structured interview guide. Data analysis and data gathering occurred simultaneously, which is typical of qualitative and abductive research (Stake, 1995, p. 9). The data were analysed with the help of content coding, theme-based categorising and mind mapping while themes arose from the data.

Analysis of Mobile Monday - Orchestration mechanisms influencing ACAP in the international innovation community

Knowledge mobility

The knowledge base of the Mobile Monday community is kept deliberately very diverse. The participants have very different professional, education and cultural backgrounds. People come from start-ups, mobile operators, mobile technology, media, the music industry, the gaming industry, non-profit organizations, and political arena, and have dissimilar professional backgrounds. Entrepreneurs, managers, technology experts, marketing people, financers, researchers, and students are participating the meetings. The community orchestrators have succeeded in attracting people from different industries, which is a good substratum for innovation processes. Of course, such a varied knowledge base also makes it challenging to find a suitable level of "overlap" and common cognitive schema. However, it seems as if the common denominator can be found in mobile business development, which allows sufficient common framework for new combinations of knowledge to emerge. The meetings are arranged in a manner that each meeting attracts those interested in a specific theme discussed in a meeting, which typically ensures that there is enough common ground for fertile discussion and idea generation. In order to promote communication in general, English has

been made the official working language of each chapter. This allows dissemination of presentation materials quickly across the whole network. Active efforts have been targeted to making as much information and knowledge available as possible. Meetings are open to anyone, and materials are disseminated through the Internet. As knowledge related to innovation activities has a remarkable tacit component, codification activities have a strong role both at chapter and network level. In MoMo, codification happens in many forms – videos and recordings of the events, open presentation material, and blogs on chapter or global web pages. Communities (like Facebook) and Google groups enrich the online communication in some of the chapters. "Online is like making the physical event transparent, discussion starts there". (Chapter leader, Norway). All of these orchestration activities support *acquisition and assimilation* dimensions, that is, *potential absorptive capacity*. This also forms the basis for transformation and exploitation of the knowledge, but more is needed in order to reach them.

While there is common interest in mobile technology, its applications and related common jargon and schema, the lack of a sufficiently strong vision of the development of the industry restricts assimilation of knowledge. The community is loosely coupled by nature, and mostly relies on weak ties, lacking the tightly coupled structures that would facilitate continuous knowledge flows within the community. The strong vision and adequate overlap is also hard to attain due to national and cultural differences. MoMo has locally active chapters almost throughout the world. Hence, network orchestration is also about balancing global coordination and local autonomy to facilitate *realized ACAP*, i.e. *transformation and exploitation* of knowledge. Global coordination is kept to a minimum, as only the basic premises like the use of the MoMo logos and rules on organizing meetings are formalized. The need to avoid overly tight coordination that would hamper local level innovativeness, motivation of local volunteers, and utilization of ways of doing things culture-bound is acknowledged. On the other hand, coordination activities are required to create a common "platform" to integrate knowledge. This has been a challenge since the local autonomy has been dominant. In particular, the local chapters very often represent the motives and visions of a chapter leader and so every chapter is to some extent different in its aim and focus area. "I think it is about getting everybody towards the same vision and mission and stuff like that, but it is not easy". (Chapter leader, Norway).

Following from the challenges in promoting joint vision, innovations have to large extent occurred more or less coincidentally, and have not been based on structured processes "to innovate". For example, innovation commercialization processes may be facilitated by people liaising between actors. However, such efforts are not necessarily structured, nor do they occur as an outcome of formal positions or responsibilities having been established. Nevertheless, realized ACAP in the form of an ability to utilize knowledge in operations of the participants also seems to be present in MoMo. There is clear evidence of generated innovations and especially commercialization of innovations in this community. The network brings many different actors together and offers them a forum for discussion, which stimulates innovation. "It is all about how to get others involved with the idea, and how to combine the team for that." (Coordinator, Finland). In fact, MoMo has practices that are useful regarding such processes and routines that enable analyzing, processing, transforming, and exploiting the knowledge and information that has become available. For instance, in the annual Mobile Peer Awards meetings certain innovative SMEs have the opportunity to introduce their ideas to the community. These presentations help others comprehend what is going on in the organizations, and open the door to commercial collaboration. In fact, especially SMEs and start-ups benefit from the network, and is also an important source of innovativeness in the community, providing knowledge and fresh ideas from which the large companies benefit. "MoMo could be a kind of silo where there is a thousand ideas, and MoMo community could evaluate which ones are interesting, and pick up ten potential in a month [for example] from which they could utilize five."

(Coordinator, Finland). At the moment the biggest value of the network for the innovation process seems to lie in the potential to improve commercialization of ideas.

In MoMo, many practices are efficiently utilized at the chapter level, but the global community could utilize many practices in a more coordinated way to facilitate use of various expertises across the chapters. Considering the development of *relative absorptive capacity*, the challenge is that local autonomy takes (to some extent) over the global coordination. Indeed, the high level of local autonomy may facilitate realized ACAP at the chapter level, but it seems as if between the chapters one would benefit from tighter coordination decreasing the causal ambiguity of the whole innovation community. Furthermore, chapter leaders are dedicated and meet each other regularly, but individual participants may be involved in the meetings to a greater or lesser extent. In any case, possibilities for face-to-face meetings allow mutual learning among network partners, thus, *relative ACAP* is influenced.

In sum, a couple of *contingency factors* seem to be particularly relevant in determining the effectiveness of knowledge mobility as an orchestration mechanism improving absorptive capacity within Mobile Monday: Power relationships seem to be highly relevant, because every actor is more or less powerful based on knowledge resources they bring to the network. Furthermore, power relationships are important in terms of status quo regarding access to MoMo: All interested parties are involved to ensure the variety in the knowledge pool, and more concrete collaboration is then negotiated freely in the network, with the MoMo founders and chapter leaders acting as liaisons in some cases. Social integration seems to play quite a role as well based on the fact that cohesion is created in the loosely coupled network by empowering common schema, identity and mindset. The type of knowledge might be also a contingency to be reckoned with – in terms of both tacit and codified knowledge.

<center>Promoting network stability</center>

In MoMo, achieving adequate stability could be seen as a problematic issue. "I would like us to be more collaborative, really to get to know other chapters… A lot of good ideas can come out from the global community, it is all about the collective wisdom if you like, it is about our common knowledge that we could put together to a better use. I would like to see cooperation in the international level on very specific projects, I think that it is something that was probably lacking in the past." (Chapter leader, Vancouver). However, a closer look reveals that MoMo has actually been orchestrated in rather a unique way. The whole network builds on the idea that anyone can join the meetings and it is not given that the same participants are present in different meetings. Stability is further promoted through internet forums. "If we have a capability to welcome 100 000 visitors yearly to our meetings, we must have couple of millions who want to know what is happening there and be involved, although they cannot make it physically" (Coordinator, Finland). This allows variety in the knowledge pool and makes sure that those really interested in the theme that is chosen for each meeting are present. On the other hand, this puts strain in the stability in the traditional sense (as the above quote implies). However, the chapter leaders and those most involved in MoMo stay pretty much the same, meaning that the network benefits from simultaneous dynamism and stability. In fact, this structure in MoMo facilitates *potential absorptive capacity* by increasing level of knowledge diversity in the starting phase of the innovation. However, when process proceeds towards commercialization, process is conducted in more determinant group of actors dedicated to the specific implication.

Considering *realized ACAP* development within MoMo, promoting shared meaning and identity in the network is a relevant orchestration activity. In particular, the common community identity has

been strongly promoted in MoMo. For example, People are encouraged to join the group as individuals first of all interested in being part of the group developing mobile technologies, services and the whole industry. Consequently, they do not see themselves primarily as representatives of their companies. "When you represent some company, for example in the standard development, you will go to the meeting because you are the member of the organization and you understand these issues. You don´t go there because 'I definitely want to go in there'." (Coordinator, Finland). Certainly there are some company interests involved, but individual interests seem to dominate. "This is for the people by the people kind of thing" (Chapter leader, Tokio). Shared identity facilitates the creation of liaison roles between the chapters in the community and in addition to promoting network stability it also facilitates knowledge mobility.

Power relationships are a delicate and interesting issue in MoMo. Inevitably, the opportunity to influence is a fundamental motivation for many involved: To contribute, be heard and to receive information: "You have to maintain the feeling that there is a possibility to influence" (Founder member of the network, Finland). Yet, the influence needs to be kept to a certain level and must benefit the network, not control it. Indeed, neutrality and integrity within the network can be seen as prerequisites for creating facilitative conditions for realized and *relative ACAP*. In practice this means that no single actor is allowed to dominate (and certainly not abuse) the network. For example, companies can sponsor the MoMo events, but this does not mean that they would be given network member information, control, etc. in return. They may present and introduce their practices, products and services during the meetings, but also this is done in a manner that benefits the whole community and industry. MoMo is seen as a platform to innovating and to commercializing innovations benefiting all parties equally.

In sum, for promoting ACAP development though promoting network stability, social integration seems to be relevant *contingency factor*, together with structure and power relationships (which takes a slightly smaller role). This can be seen in the evident importance of promoting shared meaning and identity in the network, the loosely-coupled structure that is complemented (and compensated) with tighter structures among the chapter leaders and smaller groups of members, and, likewise, maintaining neutrality and integrity in the community. Common identity is important because the community is established on weak ties and in that case common identity forms the basis for common aim. Meaning of neutrality and integrity are reflections of that: There cannot be common identity without adequate level of trust among actors. Finally, the structures allow generation of new combinations of knowledge while still making sure that knowledge mobility can be improved efficiently. However, in a network like MoMo, mitigating the fears of misuse is also relevant, which leads to considering network appropriability as an orchestration mechanism.

<center>Focusing on network appropriability</center>

In order to enable further open discussion between network members, innovation appropriability needs to be actively facilitated. Subsequently, trust and procedural justice are key issues within the network. "We have to retain the integrity" (Chapter leader, New York). The benefit from having a variety of knowledge in the network as the basis for capturing knowledge from both within the network and outside its boundaries is lost if the network members cannot feel secure enough. Combining knowledge within the network to notable extent, for its part, facilitates network-level appropriability in the sense that it increases causal ambiguities and tacitness towards outside actors. This should improve *potential absorptive capacity*, especially in terms of knowledge acquisition from external sources. Likewise, MoMo is built in such a way that it helps avoid appropriability problems, and, instead, utilize strong regimes of appropriability to allow safe knowledge exchange. The basic rule that discussions are kept open means that proprietary knowledge can be brought under

conversation quite safely if it is covered with patents or copyrights, for example, but otherwise, such issues should not be revealed. "You have to talk openly." (Chapter leader, New York). "The whole thought of controlling knowledge flows is wrong." (Founder member of the network, Finland). Also, everyone participates as an individual rather than as a representative of a company and the kind of mindset is supported actively.

The challenge for promoting trust and other forms of appropriability lies in the network being characteristically so loose: MoMo does utilize technical solutions to enable knowledge dissemination, but that does not seem to remove the need for people to meet in order to trust each other, which was highlighted in many interviews. Individual chapters may have smaller groups where people get to know each other, and the frequent interaction of chapter leaders may build trust between themselves, but trust between chapters is hard to establish. Nevertheless, the leaders (and even individual members) have been known to take ad hoc liaison roles in the sense that they may make available the contact details of one MoMo member to another. This is based on perceived trust, but also promotes trust among the participants, and allows for development of *realized ACAP*. In fact, power and influence in MoMo is sought through knowledge sharing that can facilitate one's position as an attractive partner. An actor who shares knowledge finds others willing to reciprocate, and it is emphasized that actor's influence, attractiveness, and status in the network can rise accordingly. Besides, if the relatively open and general discussions at the meetings lead to individual organizations working together, they can then decide on the rules themselves. Finally, lead time is relied on in MoMo to promote appropriability: "the one who does it first and creates a network behind the idea, has the superior competitive edge, compared to the fear of somebody stealing the idea." (Coordinator, Finland). This gives incentives for the MoMo members to exploit the disseminated knowledge.

Considering *relative ACAP* development, MoMo is seen as a platform for every participant to innovate together without fear of misuse. This is also realized in orchestrator's aim to maintain neutrality and integrity to avoid domination and related exploitative activities, which was also linked to earlier development of network stability. While individual MoMo members may have their backgrounds in companies that have a culture of non-disclosure agreements, promoting fairness and trust allows them to engage in discussions.

Summarizing this discussion, it is quite obvious that the appropriability regimes define to a large extent the ways in which innovation appropriability can be promoted in order to improve the functioning of the network. Thus, they need to be acknowledged as *contingency factors*. However, also power relationships play a role in terms of fear of misuse and issues related to trust development. Figure 2 below illustrates these issues and those described in the above sections on knowledge mobility and network stability in MoMo.

Orchestra-tion:	Potential ACAP (acquisition and assimilation)	Realized ACAP (transformation and exploitation)	Relative ACAP
Facilitating Knowledge mobility in the network	• Recruiting variety of knowledge bases • Finding suitable overlap between those knowledge bases • As much knowledge available as possible • Knowledge codification encouraged • Facilitating creation of strong common vision • Loose coupling characteristics of the network hamper creation of common understanding	• Balancing local vs. global implementation of knowledge to enhance flexibility needed for innovations • Some level of coordination offered to support activities • Peer awards and other such meetings allow combining of knowledge and utilizing innovative ideas jointly	• Forums for networking offered • Actively teaching each other the latest ideas • Face-to-face meetings allow mutual learning
Promoting Network stability	• Including interested parties into the network • Allowing access to those able and willing to contribute • Diverse knowledge base in the beginning	• Promoting formation of common identity and shared meaning • Avoiding domination by individual actors that would hamper knowledge sharing and stability development • More determinant group of actors in the implication stage • Liaison roles	• Balancing power relationships • Chapter leaders meet regularly and the chapter leader turnover is relatively low • Opportunities to influence
Focusing on network appropriability	• Strong regimes of appropriability and clear rules on knowledge dissemination allow safe knowledge exchange • Participating more as an individual rather	• Promoting creation of trust • Power and influence sought through knowledge sharing, not knowledge hiding – proprietary knowledge is discussed and	• Community is seen as a platform for every participant to innovate (together) without fear of misuse • Maintaining neutrality and integrity so as to

	than company representative	introduced in order to promote combining forces • Knowledge sharing is seen as a reciprocal activity • More concrete projects carried out in smaller aggregations of organizations and with specific rules	avoid domination and related exploitative activities • Farness and procedural justice promoted in relations between organizations

Figure 2. Orchestration and ACAP influenced by contingencies

Discussion and conclusions

The theoretical discussion and empirical analysis suggest that the features of innovation networks are highly relevant to ACAP development at network level, which in turn, is relevant for preserving innovativeness. Indeed, competition has changed in the sense that nowadays networks rather than solely individual organizations compete in international markets (e.g. Gimeno 2004).There are many types of innovation networks (Pisano and Verganti 2008; Powell and Grodal 2006; Möller and Rajala 2007) and the "fuzziest" type of innovation network, the innovation community, relies on weak ties and diverse sources of knowledge. The resultant variety in knowledge bases creates a good starting point for acquiring and combining knowledge for new innovation. A wide pool of knowledge increases the possibility of there being sufficiently "receptive actors" for novel external influences and plenty of possibilities to combine knowledge in a innovative way (Cohen and Levinthal 1990; Sparrow 2006). On the other hand, strong enough common knowledge base is needed as well so as to combine the knowledge within the network, and to be able to connect external knowledge into the vast pool of knowledge in a meaningful way (see e.g. Peters and Johnston 2009; Todorova and Durisin 2007). Indeed, ACAP in innovation communities will not develop fully without balance between existing and new knowledge. Orchestration in relation to these two opposite aspects is needed to make the knowledge sharing possible among the network actors, and, consequently, to facilitate ACAP development as our study shows.

It seems that in general, all the orchestration mechanisms have potential to improve the different dimensions of ACAP in the innovation community. However, there are some differences with regard to the contingency factors that are most decisive. Considering *knowledge mobility* as an orchestration mechanism, *power relationships* seem to be of importance in two main respects: first, the role of orchestrator holds surely some power and influence, but this needs to be utilized so as to promote knowledge diversity, and subsequent *potential ACAP* in the network. The question is of how to be able to utilize the prevalent benefits of large amount of weak ties and consequent large knowledge pool. It is often suggested that more tightly coupled networks and stronger ties create a stronger context for transferring knowledge (Powell and Grodal 2006; Granovetter 1973; Capaldo 2007), but innovation communities are about weak ties and loose coupling. This leads to the second issue: orchestration needs to be carried out in a manner that the orchestrator does not try to control every aspect of knowledge exchange and utilization, but rather uses the position to promote adequate overlap in the knowledge. Finding overlapping areas of knowledge facilitates knowledge assimilation (see e.g., Szulanski, 1996). This is needed as the basis to facilitate *realized ACAP* in the innovation community. Prior research has noticed that there are also problems associated with free entry, and therefore, forming smaller groups – as has been done in MoMo – may be needed (see e.g.

Terwiesch and Xu 2008. In terms of knowledge mobility as orchestration mechanism, this means that those in central positions act as liaisons and promote possibilities of network members to understand each other (typically, network members can get in touch with only a fraction of other members and liaisons are needed; see e.g. Heaton and Taylor 2002). In this, the *nature of knowledge* can be relevant contingency. For example, promoting codification of tacit knowledge within the community can improve the chances of generating innovation. Surely, *social integration* can also play a role, especially considering *relative ACAP*. As noted, in MoMo traditional coordination (management by commanding) is kept to a minimum, which allows the needed heterogeneity to take place (e.g., Bohlmann et al. 2010), but at the same time there is a strong emphasis to facilitate social integration. Common identity and shared meaning become important coordination mechanisms in loosely-coupled network like innovation communities are (see e.g., Orton and Weick 1990).

Network stability used to influence ACAP of networks is also affected by contingency factors. Whereas most companies have relatively stable and clear structures, innovation communities such as MoMo are quite different. Therefore, promoting ACAP is different as well. *Social integration* (based on the loosely coupled character of the network) takes pronounced role as a contingency factor (Todorova and Durisin 2006; Van den Bosch et al. 1999). Considering *potential ACAP*, it is important to acknowledge that innovation activities based on loosely structured links invite certain randomness into the innovation activities, and paying attention to the quality of ties between the actors may tackle this. In MoMo, the relatively stable relationships between the founders and chapter leaders provide enough *structure* for the network to allow scanning and identification of relevant knowledge. However, orchestration via network stability (and bound by social integration) really becomes relevant in development of *realized ACAP*. Being able to create long-term interaction between the network participants enhances possibilities for deeper interaction (Cohen and Levinthal, 1990, Garud and Nayyar, 1994, Breschi et al., 2000, Montobbio, 2003). Reaching certain level of stability allows transferring also uncodifiable tacit knowledge, which promotes exploitation of knowledge. This hardly happens without network members identifying themselves as a part of the network, as, common schema, common identity, and shared meaning are needed to produce final outcomes (Peters and Johnston 2009). Therefore, social integration is also relevant for development of *relative ACAP* in the network. However, also *power relationships* may come into play, as without certain use of power positions, it may be hard to reach "tight" enough innovation community to benefit from "strength of weak ties". A question arises what is the suitable level of cohesion and range of network relationships (Reagans and McEvily 2003).

Regarding *innovation appropriability* as an orchestration mechanism, the *regimes of appropriability* naturally define the frame within which the moves can be made. In general,
The opportunity to protect and benefit from innovations (appropriability regime) makes actors either invest or ignore investments in ACAP (Zahra and George 2002). Protection can also enable the network members to share knowledge more freely and easily among the community members (Hurmelinna-Laukkanen 2009). Actors feeling that their input is likely to be abused will not join the network, or will withdraw from efficient knowledge exchange (Dhanaraj and Parkhe 2006). Therefore, the *potential ACAP* could be compromised if innovation appropriability could not be promoted. Considering network-level *realized ACAP*, appropriability regimes of firms need to be put aside, however, which may create some tension. Appropriability takes a more pronounced role when the activities turn towards value capturing (Hurmelinna-Laukkanen 2012), which means that at commercialization phase, it typically is more important than access to external knowledge at firm level. However, considering networks, the situation is different: in MoMo the network is quite relevant in the commercialization phase, meaning that the appropriability issues need to be more about fairness than actual knowledge protection. Putting protective approach aside is also relevant for the development of *relative ACAP*. On the other hand, Social *interaction* decreases opportunistic

behavior in the network and make actors even to look after partners´ knowledge assets aside their own. Excessive weight put on rules and structures is likely to be counterproductive. It is better to concentrate on the substance and common interests.

These findings contribute to the discussion on absorptive capacity at network level, an issue that has not been fully examined or understood. Our examination reveals some important issues regarding ACAP development in innovation communities that are quite different from more structured networks or individual organizations. For example, adding coordination to the extent that would be present in other context may break the network and deter innovativeness. Absorptive capacity can still be developed based on activities that have smaller, more discreet effects.

Surely, this study focuses only on limited points of view. It still provides a starting point for understanding the premises of developing absorptive capacity in innovation networks through different orchestration mechanisms and activities. As more similar cases are combined, quantitative research may offer more insights into the ACAP related questions at network level. Our study (and its limitations) can be used as a basis for new areas of research.

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