



DRUID
society

Paper to be presented at
the DRUID16 20th Anniversary Conference
Copenhagen, June 13-15, 2016

Conditions for entrepreneurial ecosystem development – the SMEs perspective

Agnieszka Radziwon
University of Southern Denmark
Innovation and Design Engineering
agra@mci.sdu.dk

Marcel Bogers
University of Copenhagen
Department of Food and Resource Economics
marcel@ifro.ku.dk

Alexander Brem
University of Southern Denmark
Innovation and Design Engineering
brem@mci.sdu.dk

Abstract

In this paper, we explore on the value creation and capturing process in a regional entrepreneurial ecosystem. We investigate the conditions for the ecosystem development with a particular focus on small and medium sized enterprises (SMEs), potentially the largest group of stakeholders within many ecosystems. The key findings discussed in the paper include general organizational requirements and governing structures, the role of leadership and ownership of the initiatives, and suggestions for potential collaborative areas. The paper concludes with suggestions both for potential inter-firm collaborative areas and for policy makers' support.

Conditions for entrepreneurial ecosystem development – the SMEs perspective.

ABSTRACT

In this paper, we explore on the value creation and capturing process in a regional entrepreneurial ecosystem. We investigate the conditions for the ecosystem development with a particular focus on small and medium sized enterprises (SMEs), potentially the largest group of stakeholders within many ecosystems. The key findings discussed in the paper include general organizational requirements and governing structures, the role of leadership and ownership of the initiatives, and suggestions for potential collaborative areas. The paper concludes with suggestions both for potential inter-firm collaborative areas and for policy makers' support.

KEYWORDS:

entrepreneurial ecosystem, SMEs, open innovation, business ecosystem, institutional theory, socio technical systems

INTRODUCTION

Scholars have been exploring ecosystems from various perspectives. The most known studies propose a the conceptual basis (Adner & Kapoor 2010; Van Der Borgh et al. 2012; Moore 1993), and discuss the role of large firms as orchestrators (Rohrbeck et al. 2009), as well as look at interaction between different stakeholders (Van Der Borgh et al. 2012). Nevertheless, contemporary research does not put sufficient attention to small and medium sized enterprises (SMEs), which often represent the largest group of ecosystem stakeholders, neither to the ways of how do they create and capture value for the ecosystem. Therefore, this paper explores prerequisites for ecosystem development seen from the perspectives of SMEs.

In order to carry on this investigation, we look at SMEs from the open innovation lenses thus analyzing base our study on open innovation theories, which allow us to explore knowledge inflows and outflows supporting improvements in innovation performance (H. Chesbrough 2003; Dahlander & Gann 2010; Gassmann 2006). In recent years, the role of open innovation in SMEs has received an increasing interest (Brunswick & Van de Vrande 2014; Van de Vrande et al. 2009). Nevertheless, there are still relatively few studies which analyze value creation and capturing in ecosystems from the SMEs perspective; especially in the context of open innovation (Van Der Borgh et al. 2012). Thus, through this paper, we would like to contribute both to ecosystems and open innovation literature by developing a better understanding the prerequisites for SMEs allowing them to create an added value for ecosystems they are part of.

Last, contribution of this paper is an attempt to look at the ecosystem from a combination of socio-technological system and institutional theory. So far, only Thomas & Autio (2014), in their conceptual paper, tried to bridge the ecosystem perspective and institutional approach. We take it a step further by building an analytical framework based on

a combination of socio-technological system and institutional theory, which links together two ecosystem conceptualizations, namely business and entrepreneurial ecosystems.

This paper investigates how SMEs embedded within a larger ecosystem, create and capture value for the open innovation ecosystem through a case analysis (Eisenhardt 1989; Glaser & Strauss 1967) of six manufacturing SMEs. Taking into consideration that generating new opportunities for additional value creation happens much more often in open innovation than while following closed innovation principles, this paper will explore the SMEs' perspective on potential collaborative initiatives, which could take place within the local, southern Danish ecosystem. Empirical research on ecosystems focus mostly on the large firms (Bosch-Sijtsema & Bosch 2015, Hienerth et al. 2014; Isckia 2009; Li 2009, Rohrbeck et al. 2009) as the unit of analysis, that is why our study fills out the research gap related to a missing small firms' perspective. This study specifically explores the ecosystem as a unit of analysis, in which the various SMEs are embedded, and thereby addresses their role in the larger ecosystem of complementary partners (Adner & Kapoor 2010; Van Der Borgh et al. 2012; Moore 1993).

The paper begins with providing a theoretical background of the study, including ecosystem perspective as the unit of analysis, an open innovation which is a context of the study as well as an analytical framework which emerges from a combination of socio-technological system and institutional theory. Next, we describe the applied research strategy, including theoretical sample justification, data gathering protocols, and the analytical techniques used to develop the findings. Subsequently, the case study findings are presented. We conclude with a discussion of the key findings and implications for SMEs open innovation management in the context of the regional ecosystem, as well as their limitations and possible future research extensions.

THEORETICAL BACKGROUND

Ecosystem perspective

Ecosystems concept gets increasing attention from various communities of scholars. The original concept constitutes a biological parallel to an ecosystem where various species interact and coevolve on a particular geographic location. Nevertheless, different taxonomies started to appear already in '70ties in organization ecology (Hannan & Freeman 1977; Trist 1977; Amburgey & Rao 1996) and evolutionary economics within innovation systems (Malerba 2002; Cooke et al. 1997; Martin & Sunley 2006). As innovation and networking aspects seems to be of a high importance of any type of ecosystem there are also strong links to value networks (Normann & Ramirez 1993), business parks, clusters and technopoles (Löfsten & Lindelöf 2001), and open innovation (Chesbrough 2003).

Based on the literature review we have distinguished four main types of ecosystems that scholars have been referring to and these are: business ecosystems (Iansiti & Levien 2004; Moore 1993), innovation ecosystems (Adner 2006; Adner & Kapoor 2010), entrepreneurial/entrepreneurship ecosystems (Isenberg 2010; Prahalad 2005) and knowledge ecosystems (Clarysse et al. 2014; Van Der Borgh et al. 2012). Most of these concepts are linked by inter connected and interdependent stakeholders (Adner & Kapoor 2010; Iansiti & Levien 2004; Adner 2006; Van Der Borgh et al. 2012; Moore 1993) located on a particular territory(Iansiti & Levien 2004; Kanter 2012), which is not limited to a region (Isenberg 2010; Autio et al. 2014), unless it is a virtual platform (Mäkinen et al. 2014). Many ecosystems are centered on a platform that ecosystem members use to support their innovative performance (Gawer & Henderson 2007; Li 2009; Li 2009; Iansiti & Levien 2004). Competitors and complementors collaborate to create the value both for them and for the ecosystem. Usually there is an orchestrator or a keystone that supports both the development of the ecosystem at large and the enhancement of its performance through

innovation (Iansiti & Levien 2004; Zahra & Nambisan 2012; Isckia 2009; Clarysse et al. 2014; Rong et al. 2013). This role could be played by a large firm (Adner 2006; Adner & Kapoor 2010; Iansiti & Levien 2004; Kanter 2012; Moore 1993), university, public research organization or governmental institutions (Clarysse et al. 2014; Van Der Borgh et al. 2012), which do not fully focus on management, but rather establishing a fruitful environment through business friendly policies (Isenberg 2010). Ecosystems consist of different stakeholders, such as: suppliers, customers, competitors, universities and other complementors, who contribute to the process of creating the value (Van Der Borgh et al. 2012; Iansiti & Levien 2004; Eisenhardt & Galunic 2000; Moore 1996; Adner & Kapoor 2010; West & Bogers 2014; Afuah 2000). These stakeholders (called loosely interconnected participants (Iansiti & Levien, 2004, p. 5) usually have relatively strong connections to the extent that they may strongly 'depend on one another for *their effectiveness and survival*' (Iansiti & Levien, 2004, p. 5). In the context of open innovation, knowledge becomes an important medium of interaction between the members of an ecosystem. Firms located in an ecosystem build their competitive advantage through collaboration with complementary partners (Adner & Kapoor 2010; Garnsey & Leong 2008; Nambisan & Baron 2013; Clarysse et al. 2014, Shahabeddini Parizi & Radziwon 2016) or thanks to application of knowledge available in the region (Clarysse et al. 2014; Van Der Borgh et al. 2012). Close interactions as well as mutual interdependences between ecosystem institutions should assure creation of innovative outcomes developed in value co creation process (Gastaldi et al. 2015; Autio et al. 2014; Mäkinen et al. 2014). This process should be stimulated and supported by policy makers and entrepreneur support networks (Autio et al. 2014).

Open innovation in SMEs and in the ecosystem context

Studies have shown that inter-organizational collaboration can be an important driver for innovation performance (Powell et al. 1996, Shahabeddini Parizi & Radziwon 2016).

Accordingly, firms embedded in networks can leverage their external environment to achieve better innovative output (Shan et al. 1994). Building on the increasing interest in open innovation in both large companies and SMEs, a recent study focuses on the effects of open innovation practices in SMEs, relative to large companies (Spithoven 2013). This research shows that open innovation activities are performed more intensively in SMEs. SMEs are also more dependent on open innovation than big companies, because as its practices have much more significant impact on their revenues. In terms of search strategies, which generate innovative turnover, SMEs benefit from them much less than large companies. What is more, the researchers point out collaboration between SMEs and other innovation partners as a mean to foster the introduction of new offerings (Radziwon et al. 2016, Shahabeddini Parizi & Radziwon 2016).

Open innovation, which describes knowledge inflows and outflows for improved innovation performance, is widely acknowledged as an important innovation management practice (Chesbrough 2003; Dahlander & Gann 2010; Gassmann 2006). However, many aspects of this field are not yet well explored and our understanding of the open innovation concept is therefore still underdeveloped (Huizingh 2011). For example, still relatively few studies concentrate on open innovation in small and medium sized enterprises (SMEs). Existing qualitative studies look at tools, methods and social interactions that influence the integration of a particular type of innovator (Neyer et al. 2009), and the misalignment between the entrepreneurs' opinions and innovative output (Massa & Testa 2008). A few quantitative studies focus on trends, motives and management challenges (Van de Vrande et al. 2009), and on intermediation and its role in facilitating innovation in SMEs (Lee et al. 2010; Spithoven et al. 2011).

Successful innovation increasingly relies on a more open approach towards obtaining, integrating and commercializing external sources of knowledge (Chesbrough et al. 2006;

West & Bogers 2014; Laursen & Salter 2006). This is very important because ‘innovative businesses can’t evolve in a vacuum. They must attract resources of all sorts, drawing in capital, partners, suppliers, and customers to create cooperative networks.’ (Moore 1993). There may be a particular challenge for SMEs to develop such a network given that they may, to a large extent, become dependent on external sources of innovation to complement their internal knowledge base. As such, SMEs are challenged to find new ways to organize their innovation activities in the larger context than their current operational scale (Van de Vrande et al. 2009).

Institutional theory lens and socio-technical systems perspective

Geels & Kemp (2007) define the socio-technical system as a construct created by a group of elements involving ‘*technology, science, regulation, user practices, markets, cultural meaning, infrastructure, production and supply networks*’ (Geels & Kemp 2007) (p.2). These elements are generated, maintained and treated by the supply and demand side actors (Geels & Kemp 2007). The first group consists of companies, universities, research institutions as well as policy makers and the second one covers a wide range of customers, users and other interest groups (Geels & Kemp 2007). This can be reflected on the ecosystem components, which also combine supply and demand side actors.

The multilevel perspective (MLP) discussed by Geels & Schot (2007) consists of three heuristics levels (Geels 2002; Rip 1998) niche-innovations, sociotechnical regimes and sociotechnical landscape. These could be subsequently compared to the space where the innovation emerges, the set of institutions and rules which set the ecosystem boundaries as well as, an ecosystem’s business environment. Successful interaction between the ecosystem members emerge on the intersection of national culture and both political and legal system and entrepreneurial cognition (Nambisan & Baron 2013). We will further elaborate on the alignment between ecosystems elements and their allocation in the institutional theory.

Sociotechnical landscape, which *'forms an exogenous environment beyond the direct influence of niche and regime actors (macro-economics, deep cultural patterns, macro-political developments'* (Geels & Schot 2007) (p.2) resembles a business environment of an ecosystem which is exposed for an influence from the government and policy makers. It is strongly related to any ecosystem due to its impact on the shape and possible impact on the landscape changes. A landscape is conceptually much closer to the entrepreneurial ecosystem than to any other ecosystem kinds. This happens due to acknowledgment of the role played by the government and its leaders, which impact could go beyond direct influence (Geels & Schot 2007). Nurturing and sustaining the entrepreneurship as well as providing direct or indirect support (Isenberg 2010) are allocated on the landscape level.

Sociotechnical regime resembles institutions as well as the rules that are present in a technology driven ecosystem. According to Geels & Schot (2007) (p.2) this regime *'accommodates this broader community of social groups and their alignment of activities'*. Both Moore (1996) and Iansiti & Levien (2004) see some community related characteristics in an ecosystem, which are reflected in close geographic proximity as well as shared (economic) interest. Nevertheless, in case of inter organizational and in particular inter firm relationships the sense of belonging to the community could be reflected in interdependencies between ecosystem members. Various stakeholders like firms and supporting organizations (Autio et al. 2014) coevolve all together and despite of sometimes divergent business objectives they all together strive towards an end goal which is economic wealth and prosperity generation (Prahalad 2005). The social aspect of the ecosystems is also visible in the work of Carayannis & Campbell (2012) who go beyond the traditional Triple Helix relationships (Etzkowitz & Leydesdorff 2000) and add a civil society that constitute a new element of their Quadruple Helix model.

Last, but not least the niche-innovation or technological niches ‘are carried and developed by small networks of dedicated actors, often outsiders or fringe actors’ (Geels & Schot 2007) (p.2). They exhibit a micro level space where radical innovations emerge, what is very much aligned with the ecosystem space that accommodates both entrepreneurs and entrepreneurial teams (Autio et al. 2014), who are the driving force of the innovation. According to Geels & Schot (2007) both the technological niches and sociotechnical regimes have similar structure, but the first one is smaller and less stable than the second.

In regards to the Geels (2004) analytic dimensions framework, the socio-technical systems responds to a business ecosystem, rules and institutions to governmental level actors and human actors, organizations and social group in the context of an ecosystem are the entrepreneur or entrepreneurial team is located and the ecosystem (see Figure 1). This parallel could explain emergence of different conceptualizations of an ecosystem, which has started with business ecosystem (Moore 1993) and then evolved into an entrepreneurial ecosystem (Prahalad 2005) .Rules and institutions as well as human actors (Geels 2004) are the exact differences between these two types of ecosystems.

Insert Figure 1 about here

RESEARCH DESIGN

This study is focused on an ecosystem as the unit of analysis. The research sample consists of exploratory interviews conducted among Danish manufacturing SMEs from the regional ecosystem in Southern Denmark (see Table 1). The interviews were conducted among six SMEs embedded in the regional ecosystem.

Insert Table 1 about here

The original theoretical sample was chosen based on: 1) openness to collaboration with other companies and institutions 2) size and the location of the company. First, researchers tried to select companies that show certain degree of openness for external sources of knowledge. That is why, we have focused on companies that are active in different types on local organizations (e.g. different clusters) as well as those that have documented history of collaboration (related both to core and noncore activities) with other local companies or public institutions (e.g. the university). Second, important criteria were both the size of the company (in order to achieve diversity within the SME sample) and the spatial proximity between the selected companies (the distance between the central city in the region and company should be within a radius of 25 km) (Sternberg 1999; Freel 2003). The diagram presenting an overview over the ecosystem is presented on the Figure 2.

Insert Figure 2 about here

All interviews were conducted face-to-face with CEOs, managing directors or co-owners of the company and they were combined with visit to their manufacturing facility. Most of the companies were interviewed twice in the period of 3 months. All the interviews were recorded, transcribed and shared with interviewees for data validation. Additional information about the companies was collected from publicly available registers, company web sites as well as documents received from the interviewees.

The data analysis related to an inductive qualitative study with a grounded theory approach, where researchers tried to extract, identify and develop themes that capture the

innovation phenomenon in SMEs (Dougherty 2002). In this inductive analysis, we attempted to identify themes of findings from within the embedded cases, while comparing the finding across cases as an analytic technique. The grounded theory approach was reflected in the construction categories of findings by developing categories of information (open coding), interconnecting the categories (selective coding), and building a story that connects the categories (axial coding), upon which the final findings are based (Corbin & Strauss 1990; Dougherty 2002). As such, the construction of categories can be seen as an iterative process that establishes common meaning across multiple observations (Locke 2001).

FINDINGS

The interviewed companies indicated several factors, which could possibly facilitate better future collaboration and value creation in an ecosystem. These factors are discussed in the following manner. First, we structure them according to the analytical framework discussed in the theoretical background section (see Figure 1). We start with business (and also innovation) ecosystem elements and then precede to the remaining entrepreneurial ecosystem elements. Then we conduct a joined concluding discussion in the following section.

Business Ecosystem elements

In order to create and hopefully also capture value, ecosystem members have to share business objectives and innovation – driven goals (Ritala et al. 2013; Radziwon et al. 2016, Adner & Kapoor 2010; Adner 2006) (**Table 2; Company A, C, F, G**). What is more, the common goal has to be not only known, understood, by every member and also be able to incentivize companies to the extent that stimulates the action. The collective awareness of how these (mutual) objectives are to be reached is also very important if participants should

engage in a joined activity (Gulati et al. 2012). This could apply both to the ecosystem as well a particular initiative/ project that is conducted within it.

Insert Table 2 about here

The ecosystem literature (Iansiti & Levien 2004; Isckia 2009) indicates the importance of a leader, or so-called central ecological contributor, which is a driving force of the whole community (Moore 1993). Other scholars discuss the coordinating role of a governance structure (Gulati et al. 2012; DiMaggio & Powell 1983) which play an important role in the decision making process . A natural leadership in various ecosystem examples is taken by a large company, which not only has necessary resources, but usually also performs technological leadership (Adner & Kapoor 2010; Iansiti & Levien 2004; Moore 1993). Interviewees pointed out that they definitely see a need of having someone in charge of potential ecosystem activities (**Table 2; Company A, D, F, G**). Some of them mentioned a leader, manager or just a kind of coordinator. What they mentioned as important tasks that this person should fulfill was taking care of the realization of the initiative’s goals (**Table 2; Company A, F**), assuring the right set up and taking care of the legal matter (**Table 2; Company D**) as well in general being in control of what is happening (**Table 2; Company G**). Even though SMEs tend to undertake open and collaboration focused approach, they also see potential barriers related to closer collaboration with large enterprises (**Table 2; Company G**). What is more, despite the fact they also recognize different working style, and other potential challenges, the university is also seen as an important partner (**Table 2; Company G, Table 3; Company A, E, F**). One of the interviewees suggested that both the university and the (local) government through different initiatives are a binding force of various types of the collaborations inside the ecosystem, which could be a way of combining

interests of various stakeholders of the ecosystem (Radziwon et al. 2016, **Table 3; Company A**).

Insert Table 3 about here

Next to shared business objective and a leader/ facilitator interviewees were pointing out commitment and sense of ownership of the joint activity an important prerequisite for further development on ecosystem initiatives (**Table 2; Company A, C, F**). In their view this is something that maybe hard to achieve and was already missing in some of the previous activities they were involved in. In their view maintaining an interest and keeping partners incentivized to invest their time and money on a particular initiative is crucial in order to achieve any long term common goals. Lack of motivation could easily result in losing interest in further involvement, especially in case of SMEs. This is particularly related to general level of their resources (especially money, time and manpower), which may be significantly lower than in case of large companies, which also implies higher risk related to involvement in activities which do not directly contribute to their core activities. The echo of potential financial associated with new initiatives was also heard during the interviews. Therefore some of the SMEs would prefer to have some external funding available to support new projects and initiatives, since they may not be able to finance them themselves (Radziwon et al. 2016, **Table 2; Company A, C, F**). Research shows that due to financial instability, SMEs may be exposed to difficulties related to the potential expansion of their activities (Van de Vrande et al. 2009). Therefore availability of additional funding could lower significantly the risk related to their involvement in any collaborative activities (Blomqvist et al. 2005; Sjödin et al. 2011).

One of the interviewees suggested that the money could be easily obtained from various development agencies and institutions that are part of the Danish innovation system (**Table 2; Company F**), however the role of large companies in the funding process may also play an important role in the ecosystem development (**Table 3; Company F**). Despite of the concerns related to potential collaboration with large firms, due to potential discrepancies in shared business objectives and different style of work, some of the interviewed SMEs think that large firms should be concerned and maybe also partly responsible for the regional growth (**Table 3; Company A, F**), thus indirectly support the development of the ecosystem. These thoughts may be supported by set of common interests, which seems to be shared between the ecosystem members. The most mentioned is the attraction of skilled manpower to the region (**Table 3; Company A, C, D, E**). According to one of the ecosystem members the companies in this region compete only on human resources (**Table 3; Company D**), however there could be also observed a rotation of people between different ecosystem members (**Table 3; Company F**).

Insert Table 4 about here

The literature reports that collaboration on the technology level is a popular domain of interaction between large and small firms, where typical modes are: licensing agreements, joint ventures, sponsored spin outs (Rothwell & Dodgson 1991), this thought is also supported by one of the interviewees that suggests technology and processes as potential and promising knowledge sharing areas(**Table 4; Company D**) . However, there are also different opinions about the potential collaboration areas. Another interviewee (**Table 4; Company E**) suggests that between SMEs this collaboration goal should not be on the technology level, since it may be too difficult to find a suitable one and turn it into reasonable

project in terms of time span, but instead the collaboration may involve a joint product development, which is also supported by Company A (**Table 4; Company A**). Nevertheless, the technological interdependencies, which could be reflected in joint technology or product development is perceived as one of the elements that may constitute an integral part of an ecosystem (Thomas & Autio 2014). An alternative collaboration idea is to share the resources for example manpower (**Table 4; Company D, F**). Ecosystem members could create joint groups of people using the same hardware/ software or mechanics and maybe also share employees on the non-competitive areas.

Entrepreneurial ecosystem

Entrepreneurs and entrepreneurial teams (actors and social groups)

Entrepreneurial ecosystem does not evolve independently, but through involvement of actors and social groups such as the sociotechnical system (Geels 2004). In order to stimulate collective value creation a trust interaction between ecosystem participants is necessary (Iansiti & Levien 2004; Thomas & Autio 2014). Trust, on interpersonal as well as on inter-organizational level (Zaheer et al. 1998) impacts the willingness to establish new inter-firm relationships and interdependencies. According to one of the interviewees, getting to know each other (**Table 2; Company A**) or trusting each other (**Table 2; Company C**) is crucial in setting up new initiatives within the ecosystem. Gulati (1995) while exploring factors that explain the choice of governance structures in inter – firm alliances, found evidence supporting trust and familiarity are very important factors in inter-firm cooperation. Therefore, a company embedded in a business ecosystem could benefit from lowering transactional costs related to the search of potential partners. Nevertheless, as stated by another interviewee (**Table 2; Company F**) this familiarity and already existing good relationships may also hold some of the companies from getting involved in new initiatives. This is related to potential risks that may emerge together with new activities. According to

the same interviewee (**Table 2; Company F**) some of the companies may hesitate to get into closer collaboration, because in case if it is unsuccessful, they may worsen their current, good relationships with other ecosystem members as well have a negative influence on their reputation and creditability in general. What is more, the closer companies are the more impact it could have for their future development. From the other hand the same relations and interdependencies could stimulate ecosystem members to stay transparent in their actions and make sure that they do not lose already existing trust and credibility within the ecosystem. Any forms of unfair attempts to gain competitive advantage could thus result in lowering chances for potential partnerships and alliances.

Policy makers, governmental agencies (sociotechnical regime)

According to institutional theory, organizations should conform to the rules set by institutions (Meyer & Scott 1983). The governance system should consist of rules, norms and assumptions that guide and regulate interactions among the participants (Garud et al. 2002; Scott 2013). This indicates boundaries of an ecosystem; nevertheless involving interested ecosystem members into the discussion about the structure of these boundaries is not to be underestimated. According to Isenberg (2010) policy makers and governmental agencies, based on the advice from established market players, are responsible for setting up entrepreneurial friendly frameworks, programs and reduce the structural barrier. Garud et al. (2014) propose a concept of anchor events, which could not only serve as networking platform for various ecosystem stakeholders but also policy makers as the initiator could gather an important input in regards to the potential entrepreneurial support activities.

Some of the interviewees (**Table 4; Company F, G**), brought the topic of competencies, which are very specific for the region and particularly present in the ecosystem. Their way of thinking seems to very much align with the smart specialization concept, which goes far above company level and touches upon activities, which could lead

the region to specialize both in R&D and innovation (Foray et al. 2009). The concept has a strong link to regional policies, which should prioritize developing of '*distinctive and original areas of specialization*' (Foray et al. 2009). What is more, it is also in line with (Normann & Ramirez 1993) who consider specialization a performance driver. Nevertheless a strong support from various governmental institutions (both on the local and national level) is necessary in order to benchmark an ecosystem according to the core competencies that are part of it, which as a result will contribute to the value creation process of the entire community (Bovet & Martha 2000).

CONCLUDING DISCUSSION

This study explores how SMEs perceive on prerequisites for the development of the regional ecosystem that they are embedded in. In this paper we looked at SMEs through institutional theory and socio-technological system lens, with a special focus on potential joined initiatives and collaborative innovation (Bogers 2012; Enkel et al. 2009). We observed that shared goals and business objectives are important prerequisites for value creation and capturing in the ecosystem (Ritala et al. 2013; Adner & Kapoor 2010; Adner 2006). Additionally, ecosystem members expect good communication across the ecosystem as well as coordinating governance structures structure (Gulati et al. 2012; DiMaggio & Powell 1983), which will also be driving force of joint activities. All those findings indirectly imply the leadership of the ecosystem as an important part of managing inter-company initiatives. Some of the companies indicated local large firms as socially responsible for supporting those initiatives, but taking into consideration both perception differences as well as power imbalance, large enterprises were not viewed as natural leaders, what is in contradiction with Moore's (1996) assumptions. This could, in some way question the institutional theory assumption that organizations need to conform to the norms of the systems prevailing in their

environment (DiMaggio & Powell 1983), and drift more into Isenberg's (2010) view that these structures should be flexible enough to adjust according to the entrepreneur's needs.

The importance of shared goals in potential collaborative initiatives taking place among the stakeholders of the ecosystem (Gulati et al. 2012; Adner & Kapoor 2010; Adner 2006), the need of leadership and commitment for those initiatives as well as potential issues related to funding could contribute to the awareness of policy makers and attract some attention of national and regional government for open innovation in business ecosystems as potential contributors to the regional development (Isenberg 2010; Autio et al. 2014).

Last, the empirical findings relate to the smart specialization (Foray et al. 2009). The concept originated from a spatial sector, but has recently been raised in a regional context (McCann & Ortega-Argilés 2013). In order to find the relevant domain, achieve critical mass and a required level of connectedness, open innovation in ecosystems have to be considered as places where smart specialization could be initiated and developed.

Finally, we believe that the empirical findings are an important contribution for both academics and practitioners. From the theoretical point of view, the research adds both to the literature related to regional collaboration and entrepreneurial ecosystem development and the open innovation literature with a special focus on SMEs. Thus, the ecosystem level becomes an important unit of analysis with particular emphasis on the role of SMEs (Chesbrough et al. 2014; West et al. 2014). From a practical point of view, we believe that our findings may serve as guidelines for various ecosystem members, which either are involved in different types of collaboration or wish to do so. What is more, not only content-wise, but also method-wise, this paper's findings may be helpful for researchers who wish to establish successful projects with the industry. It could not only help in increasing our understanding of the drivers of inter-SME collaboration, but also prepare scholars for dealing with various challenges in project and process management.

Our paper makes three main contributions by addressing needs related to the emerging stream of ecosystem research. Our first contribution is to align two types of ecosystems, namely business, entrepreneurial ecosystems as well as fill a theoretical research gap between business and institutional theory approach by identifying commonalities between business and entrepreneurial ecosystem and socio-technological systems. Our second contribution is to bridge these two approaches by proposing an analytical framework, which serves as a base for empirical analysis. Last, but not least we contribute to ecosystems and open innovation literature by developing a better understanding the prerequisites for SMEs allowing them to create an added value for ecosystems they are part of.

Limitations and future research

The main limitations of this study are related to the choice of a particular region with special characteristics; in this case a mix of high and low tech. This raises the question to what extent our findings could be replicable for other ecosystems with a substantial number of SMEs. Further research could take into consideration a comparative study of two or three ecosystems either from different countries and thus representing different cultural origins or maybe mixed ecosystems in terms of companies' strategic profile; this could be a mix of high-tech and low tech companies with service oriented enterprises.

Secondly, our study takes the ecosystem, with embedded SMEs, as a unit of analysis for understanding open innovation processes and practices, while further research could focus more on different or maybe also multiple levels of analysis (Gupta et al. 2007; West et al. 2006). Other units of analysis could focus more on the individual level of open innovation in a business ecosystem. This approach could concern managers and company executives and their role in value creation or in single firm contribution to ecosystem value capturing. Also the role of the gatekeepers in managing the knowledge flows across organizational boundaries within the ecosystem could be usefully explored. Another interesting unit of

analysis could refer to inter-ecosystems relationships and the way how different ecosystems interact with one another as well as the role of SMEs embedded in various different ecosystems.

Our research findings point out the need of setting clear goals and business objectives for the ecosystem (Ritala et al. 2013; Adner & Kapoor 2010; Adner 2006), which imply further investigation of ecosystem leadership and a form of management, which could be suitable for the ecosystem members. Should the leader come from inside or outside of the ecosystem? If an outsider, how would it get the commitment of all members? If an insider, should this person come from a large company enterprise or from an SME?

ACKNOWLEDGEMENTS

We would like to thank all the colleagues from the Technology and Innovation Management division of the American Academy of Management (August 2014) as well as the Innovation division of the European Academy of Management (June 2015) that commented on the earlier versions of this manuscript. We also would like to thank the Industriens Fond for their financial support.

REFERENCES

- Adner R, 2006. Match your innovation strategy to your innovation ecosystem. *Harvard Business Review* 84(4):98–107.
- Adner R, Kapoor R, 2010. Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal*, 31(3):306–333.
- Afuah A, 2000. How much do your co-opetitors' capabilities matter in the face of technological change? *Strategic Management Journal*, 21(3):387–404.

- Amburgey T.L, Rao H, 1996. Organizational ecology: Past, present, and future directions. *Academy of Management Journal*, 39(5):1265–1286.
- Autio E, Kenney M, Mustar P, Siegel D, Wright M, 2014. Entrepreneurial innovation: The importance of context. *Research Policy*, 43(7):1097–1108.
- Blomqvist K, Hurmelinna P, Seppänen R, 2005. Playing the collaboration game right—balancing trust and contracting. *Technovation*, 25(5):497–504.
- Bogers M, 2012. Knowledge Sharing in Open Innovation: An Overview of Theoretical Perspectives on Collaborative Innovation. In de Pablos Heredero, C and López, D, ed. *Open Innovation at Firms and Public Administrations: Technologies for Value Creation*. Hershey, PA, IGI Global: 1–14.
- Bosch-Sijtsema P M, Bosch J, 2015. Plays nice with others? Multiple ecosystems, various roles and divergent engagement models. *Technology Analysis & Strategic Management*, (ahead-of-print):1–15.
- Bovet D, Martha J, 2000. *Value Nets: Breaking the Supply Chain to Unlock Hidden Profits*, New York: Wiley & Sons.
- Brunswick S, Van de Vrande V, 2014. Exploring Open Innovation in Small and Medium-Sized Enterprises. In Chesbrough, H, Vanhaverbeke, W, West, J, ed. *New Frontiers in Open Innovation*. Oxford: Oxford University Press: 135–156.
- Carayannis E.G, Campbell D.F, 2012. *Mode 3 knowledge production in quadruple helix innovation systems*, Springer.
- Chesbrough H W, 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*, Boston, MA: Harvard Business School Press.
- Chesbrough H W, Bogers M, 2014. Explicating Open Innovation: Clarifying an Emerging Paradigm for Understanding Innovation. In H. Chesbrough, W. Vanhaverbeke & J. West, ed. *New Frontiers in Open Innovation*. Oxford: Oxford University Press.: 3–28.

- Chesbrough H W, Vanhaverbeke W, West J, 2014. *New Frontiers in Open Innovation*, Oxford: Oxford University Press.
- Chesbrough H W, Vanhaverbeke W, West J, 2006. *Open Innovation: Researching a New Paradigm*, Oxford, Oxford University Press.
- Chesbrough H W, 2003. The era of open innovation. *MIT Sloan Management Review*, 43(3):35–41.
- Clarysse B, Wright M, Bruneel J, Mahajan A, 2014. Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems. *Research Policy*, 43(7):1164–1176.
- Cooke P, Uranga M G, Etxebarria G, 1997. Regional innovation systems: Institutional and organisational dimensions. *Research Policy*, 26(4):475–491.
- Corbin J, Strauss A, 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*, Newbury Park, CA, Sage.
- Dahlander L, Gann D M, 2010. How open is innovation? *Research Policy*, 39(6):699–709.
- DiMaggio P T, Powell W W, 1983. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2):147–160.
- Dougherty D, 2002. Grounded Theory Research Methods. In Baum, J A C, ed. *The Blackwell Companion to organizations. The Blackwell Companion to Organizations*. Oxford, Blackwell.
- Eisenhardt K.M, 1989. Building theories from case study research. *Academy of Management Review*, 14(4):532–550.
- Eisenhardt K.M, Galunic D.C, 2000. Coevolving: At last, a way to make synergies work. *Harvard Business Review*, 78(1):91–102.

- Enkel E, Gassmann O, Chesbrough H, 2009. Open R&D and open innovation: Exploring the phenomenon. *R&D Management*, 39(4):311–316.
- Etzkowitz H, Leydesdorff L, 2000. The dynamics of innovation: From National Systems and “Mode 2” to a Triple Helix of university -industry - government relations. *Research Policy*, 29(2):109–123.
- Foray D, David P, Hall B H, 2009. Smart Specialisation –The Concept, Knowledge Economists Policy Brief Number 9, Brussels.
- Freel M S, 2003. Sectoral patterns of small firm innovation, networking and proximity. *Research Policy*, 32(5):751–770.
- Garnsey E, Leong Y Y, 2008. Combining resource-based and evolutionary theory to explain the genesis of bio-networks. *Industry and Innovation*, 15(6):669–686.
- Garud R, Gehman J, Giuliani A.P, 2014. Contextualizing entrepreneurial innovation: A narrative perspective. *Research Policy*, 43(7):1177–1188.
- Garud R, Jain S, Kumaraswamy A, 2002. Institutional entrepreneurship in the sponsorship of common technological standards: The case of Sun Microsystems and Java. *Academy of Management Journal*, 45(1):196–214.
- Gassmann O, 2006. Opening up the innovation process: Towards an agenda. *R&D Management*, 36(3):223–228.
- Gastaldi L, Appio F P, Martini A, Corso M, 2015. Academics as orchestrators of continuous innovation ecosystems: towards a fourth generation of CI initiatives. *International Journal of Technology Management*, 68(1-2):1–20.
- Gawer A, Henderson R, 2007. Platform owner entry and innovation in complementary markets: Evidence from Intel. *Journal of Economics & Management Strategy*, 16(1):1–34.

- Geels F W, 2004. From sectoral systems of innovation to socio-technical systems: Insights about dynamics and change from sociology and institutional theory. *Research policy*, 33(6):897–920.
- Geels F W, 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research policy*, 31(8-9):1257–1274.
- Geels F W, Kemp R, 2007. Dynamics in socio-technical systems: Typology of change processes and contrasting case studies. *Technology in society*, 29(4):441–455.
- Geels F W, Schot J, 2007. Typology of sociotechnical transition pathways. *Research policy*, 36(3):399–417.
- Glaser B, Strauss A, 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Chicago, Aldine Transaction Books.
- Gulati R, 1995. Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal*, 38(1):85–112.
- Gulati R, Puranam P, Tushman M, 2012. Meta-organization design: Rethinking design in interorganizational and community contexts. *Strategic Management Journal*, 33(6):571–586.
- Gupta A K, Tesluk, P.E, Taylor, M.S, 2007. Innovation at and across multiple levels of analysis. *Organization Science*, 18(6):885–897.
- Hannan M T, Freeman J, 1977. The population ecology of organizations. *American journal of sociology*:929–964.
- Hienerth C, Lettl C, Keinz P, 2014. Synergies among Producer Firms, Lead Users, and User Communities: The Case of the LEGO Producer-User Ecosystem. *Journal of Product Innovation Management*, 31(4):848–866.
- Huizingh E K R E, 2011. Open innovation: State of the art and future perspectives. *Technovation*, 31(1):2–9.

- Iansiti M, Levien R, 2004. Strategy as ecology. *Harvard Business Review*, 82(3):68–81.
- Isckia T, 2009. Amazon's evolving ecosystem: A cyber-bookstore and Application Service Provider. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 26(4):332–343.
- Isenberg D J, 2010. How to start an entrepreneurial revolution. *Harvard Business Review*, 88(6):40–50.
- Kanter R M, 2012. Enriching the ecosystem. *Harvard Business Review*, 90(3):140–+.
- Laursen K, Salter A, 2006. Open for innovation: The role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal*, 27(2):131–150.
- Lee S, Park G, Yoon B, Park J, 2010. Open innovation in SMEs—An intermediated network model. *Research Policy*, 39(2):290–300.
- Li YR, 2009. The technological roadmap of Cisco's business ecosystem. *Technovation*, 29(5):379–386.
- Locke K, 2001. *Grounded Theory in Management Research*, Thousand Oaks, CA, Sage.
- Löfsten H, Lindelöf P, 2001. Science parks in Sweden-industrial renewal and development? *R&D Management*, 31(3):309–322.
- Mäkinen S J, Kanniainen J, Peltola I, 2014. Investigating Adoption of Free Beta Applications in a Platform-Based Business Ecosystem. *Journal of Product Innovation Management*, 31(3):451–465.
- Malerba F, 2002. Sectoral systems of innovation and production. *Research Policy*, 31(2):247–264.
- Martin R, Sunley P, 2006. Path dependence and regional economic evolution. *Journal of Economic Geography*, 6(4):395–437.

- Massa S, Testa S, 2008. Innovation and SMEs: Misaligned perspectives and goals among entrepreneurs, academics, and policy makers. *Technovation*, 28(7):393–407.
- McCann P, Ortega-Argilés R, 2013. Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy. *Regional Studies*, (ahead-of-print):1–12.
- Meyer J W, Scott W R, 1983. Centralization and the legitimacy problems of local government. In Meyer, John W and Scott, W Richard, ed. *Organizational Environments: Ritual and rationality*. Sage Publications Beverly Hills: 199–215.
- Moore J.F, 1993. Predators and prey: A new ecology of competition. *Harvard Business Review*, 71(3):75–86.
- Moore J.F, 1996. *The Death of Competition: Leadership and Strategy in the Age of Business Ecosystems*, New York: Harper Business .
- Nambisan S, Baron R A, 2013. Entrepreneurship in Innovation Ecosystems: Entrepreneurs’ Self-Regulatory Processes and Their Implications for New Venture Success. *Entrepreneurship Theory and Practice*, 37(5):1071–1097.
- Neyer A.-K, Bullinger A.C, Moeslein K.M, 2009. Integrating inside and outside innovators: A sociotechnical systems perspective. *R&D Management*, 39(4):410–419.
- Normann R, Ramirez R, 1993. Designing interactive strategy. *Harvard Business Review*, 71(4):65–77.
- Powell WW, Koput KW, Smith-Doerr L, 1996. Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly*:116–145.
- Prahalad C.K, 2005. *The Fortune at the Bottom of the Pyramid*, Pearson Education India.
- Radziwon A, Bogers M, Bilberg A, 2016. Creating and capturing value in a regional innovation ecosystem: A study of how manufacturing SMEs develop collaborative solutions. *International Journal of Technology Management*, forthcoming .

- Rip A.K.R, 1998. Technological change . In Rayner, S, Malone, E.L, ed. Human Choice and Climate Change. Battelle Press, Columbus, OH, : pp. 327–399.
- Ritala P, Agouridas V, Assimakopoulos D, Gies O, 2013. Value creation and capture mechanisms in innovation ecosystems: A comparative case study. *International Journal of Technology Management*, 63(3):244–267.
- Rohrbeck R, Hoelzle K, Gemünden H.G, 2009. Opening up for competitive advantage - How Deutsche Telekom creates an open innovation ecosystem. *R&D Management*, 39(4):420–430.
- Rong K, Hu G, Hou J, Ma R, Shi Y, 2013. Business ecosystem extension: facilitating the technology substitution. *International Journal of Technology Management*, 63(3-4):268–294.
- Rothwell R, Dodgson M, 1991. External linkages and innovation in small and medium-sized enterprises. *R&D Management*, 21(2):125–138.
- Scott W.R, 2013. *Institutions and organizations: Ideas, interests, and identities*, Sage Publications.
- Shahabeddini Parizi M, Radziwon A, 2016. Network based automation for SMEs. *International Journal of Business and Globalisation*, forthcoming.
- Sjödin D, Eriksson P.E, Frishammar J, 2011. Open innovation in process industries: A lifecycle perspective on development of process equipment. *International Journal of Technology Management*, 56(2):225–240.
- Spithoven A, 2013. Open innovation practices and innovative performances: an international comparative perspective. *International Journal of Technology Management*, 62(1):1–34.
- Spithoven A, Clarysse B, Knockaert M, 2011. Building absorptive capacity to organise inbound open innovation in traditional industries. *Technovation*, 31(1):10–21.

- Sternberg R, 1999. Innovative linkages and proximity: Empirical results from recent surveys of small and medium sized firms in German regions. *Regional Studies*, 33(6):529–540.
- Thomas L D, Autio E, 2014. The fifth facet: The ecosystem as an organizational field. In *Innovation and Entrepreneurship Group Working Papers*.
- Trist E, 1977. A concept of organizational ecology. *Australian Journal of Management*, 2(2):161–175.
- Van de Vrande V, De Jong J P, Vanhaverbeke W, De Rochemont M, 2009. Open innovation in SMEs: Trends, motives and management challenges. *Technovation*, 29(6):423–437.
- Van Der Borgh M, Cloudt M, Romme A, 2012. Value creation by knowledge-based ecosystems: Evidence from a field study. *R&D Management*, 42(2):150–169.
- West J, Salter A, Vanhaverbeke W, Chesbrough H, 2014. Open innovation: The next decade. *Research Policy*, 43(5):805–811.
- West J, Bogers M, 2014. Leveraging external sources of innovation: A review of research on open innovation. *Journal of Product Innovation Management*, 31(7):814–831.
- West J, Vanhaverbeke W, Chesbrough H, 2006. Open innovation: A Research Agenda. In Chesbrough, H and Vanhaverbeke, Wim and West, J, ed. *Open Innovation: Researching a New Paradigm*. Oxford, Oxford University Press.: 285–307.
- Zaheer A, McEvily B, Perrone V, 1998. Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization Science*, 9(2):141–159.
- Zahra S., Nambisan S, 2012. Entrepreneurship and strategic thinking in business ecosystems. *Business Horizons*, 55(3):219–229.

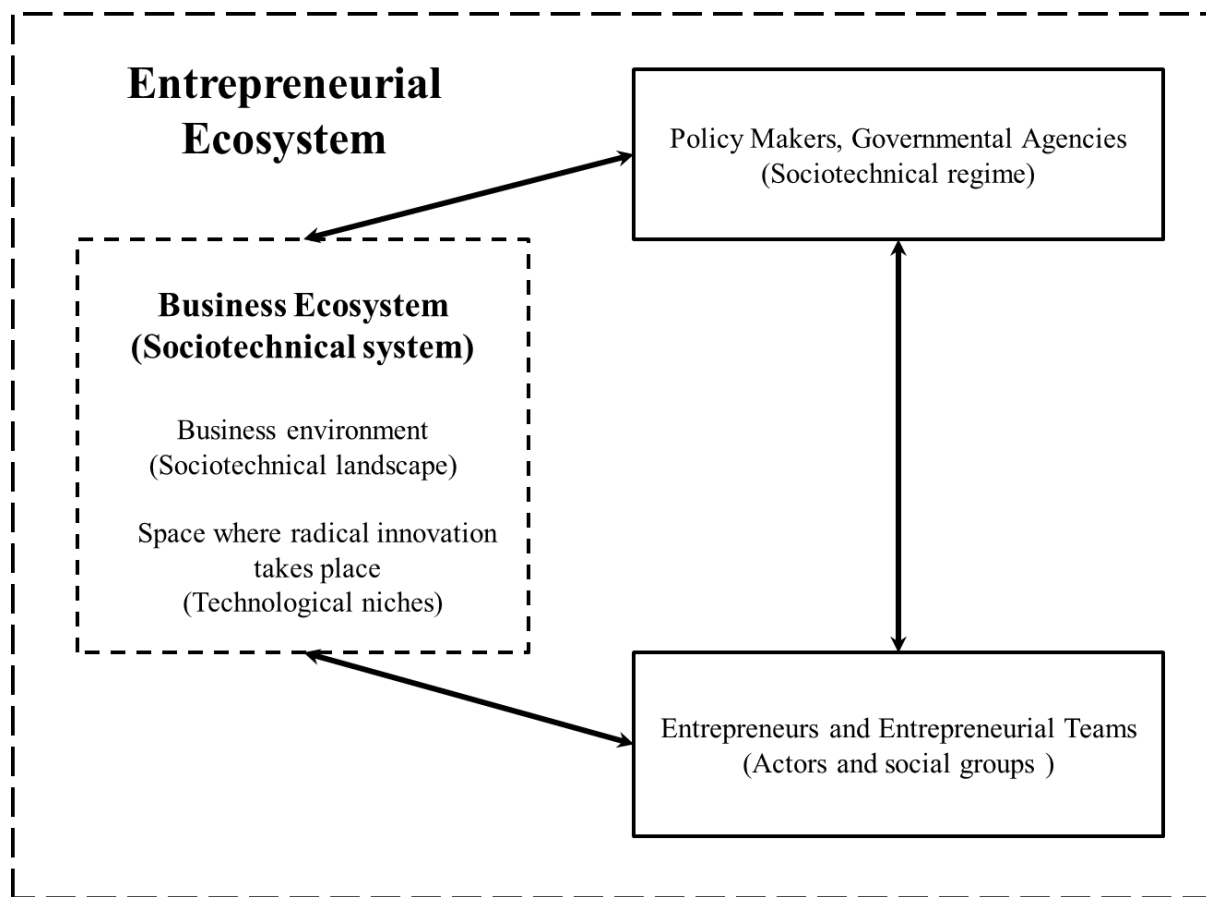


FIGURE 1

Entrepreneurial ecosystem – analytical dimensions (Geels & Kemp 2007; Geels 2004))

TABLE 1

Overview of Interviews

Company	Strategic profile	No of interviews	Interviewee position
A	Micro-enterprise	2	CEO
C	SME	2	Managing director
D	SME	2	Development manager
E	SME	2	Managing director
F	Micro-enterprise	2	CEO
G	SME	2	Managing director

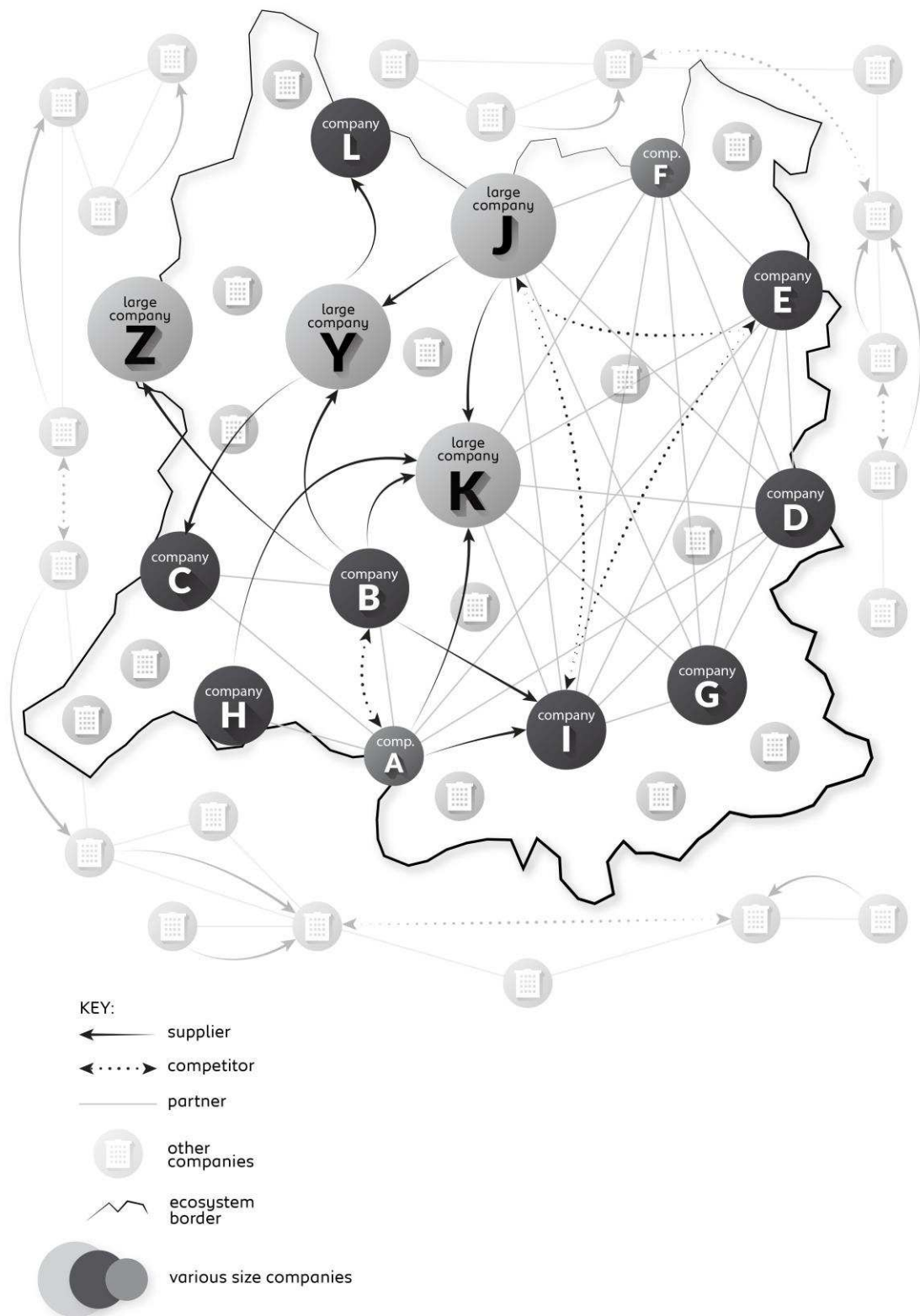


FIGURE 2

Diagram of interdependencies between ecosystem companies

TABLE 2

Empirical evidence supporting the findings – Prerequisites for Ecosystem Development

Evidence from company A	Evidence from company C	Evidence from company D	Evidence from company F	Evidence from company G
<p>“So I think what you need to do is make sure that everybody knows what the goal is where to get, and really focus on the milestones (...) cause otherwise they will be used a lot of time and there will be no outcome. That’s my opinion“</p> <p>“I think you need to spend some time together to get to know each other, that’s one thing, I think the goal is missing. It makes no sense just to meet once in a while and do some small talk; we</p>	<p>“if we have a high activity period we don’t have time, and if we have a low activity period we don’t have the money”</p> <p>“I think, to be honest sometimes it’s hard to see the benefits, because of course I have all the networks, it’s hard to see where we have something in common, especially if we are speaking</p>	<p>“For instance, if we wanted to cooperate with some companies. I mean, he [the project leader] just has to make sure that we have an overall agreement, but he shouldn’t be directly involved if we were exchanging knowledge between different mechanical developers or something</p>	<p>“(…) you need a commitment from the very top of each participating company. And this means the guys who own it. It’s not enough the guys to run it, because they don’t want to engage in this kind of stuff. Why? Because the owner say mind your business... so, you can make money for me. With the owner says to the managing director... “we want to do this because it’s good for the (...) then it’s different.”</p> <p>“(…) Look at this argument. You two days late on the last delivery and you spend all your resources on that ‘maybe project’ over there. Don’t do that. Focus more on what you have to do today.”</p> <p>“We have in Denmark a very, very good innovation system. A lot of people say: “Oh, it’s too bureaucratic. There’s not enough money” And so on. In my opinion, this is absolutely not true. It is bureaucratic, yes, but we also have to demand that. You have to know that the tax payer’s money pay out correctly. And the results are followed up. And also we don’t have to give money to</p>	<p>“(…) you have to really specific what is your goal and you have to really focus on something that people can find themselves, and you have to have a not short term, not a very long term but a something between that can fit into, and they can say that’s something for me,”</p> <p>“There is so much good knowledge at the university and there are so many good people at the university, the university needs the industry and the industry needs the university.”</p> <p>“But someone has to control of this project. And if you work in a company like [large</p>

really need some action and some concrete project where you can work together. “

[in the previous projects]“I wouldn’t say there was a **commitment**, but it wasn’t enough. We really didn’t **have one person(...)**who **said that’s the way we’re going**, we had a lot of people saying would like to go this way and I would like to go this way and everybody had their own little task they went for. But nobody said ok we are (...) everybody is going that way.”

“It can be difficult to earn **enough money** to afford to

technology. If it’s about **general management**, or it’s about **getting some money** from EU, we can say yes lets work on it together, **but it’s not that we do not know each other**, but to find something to cooperate... (...) **Trust is no problem**, but we have to believe this is a good idea. This is something we have time and money for”

like that. I mean, I don’t think he would like to get involved in that. He just has to make sure that overall **we have the right set up**. That we **don’t have any issues with the legal stuff** and that’s it.”

someone who is not able to structure its business.”

“Because what we’re talking about is making the organization and then **find the purpose afterwards**. (...) For me it was (...) I **had the purpose** and then I found (...) You know (...) it sounds as if it is something I have plan for a long time but in the reality. It can also be in an incremental process to get this kind of put together. Of course, we should build up on that. But I will love it if it could be done.”

“We would participate if we had **resources**. I don’t know. I have seen so many (...) I have been a part of so many initiatives kind of similar. But they didn’t really amount to a lot. Not because they were wrong conceptually, but because we never really succeeded in **getting enough people involved**, for real”

“If you are going to do that and that, you need a **project manager**. You need a project manager of each... the guy that everybody accepts. But you are going to run into another problem there. And this is that ... within these constellations, so to speak. If we are lucky to get some local companies to work on this, we cannot ignore the fact that they are also doing business on other projects already together (...). They don’t to

company Y], like [large company Z] then you have to have different in your class and **they have very different focus** and **very different perspectives** and they know where to go and how to go and so on so forth. And that’s exactly the difference between resume and the big companies, the entrepreneurship in the companies, the entrepreneurship and the innovation, sorry to say that but they don’t belong to very small and high tech companies. **They are not interested in what we are interested in**, so we have tried so many times to cooperate with [large company Y] we have had many more experiences with [large company Z], every time we failed. And then we can say why we failed. Is it their fault or our own fault? Or both together? But why we **are not**

finance projects”

put themselves in a position where they **risk fitting**, but it doesn't matter cause it's not **of becoming unfriendly with each other.** working.”
This is a real barrier. They don't take a lot of chances from that (...) A lot of sub-contractors ...they actually fly low ...not to take too many risks.”

“There is no enough money circulating. Simply not true either. Some funds work better than others. (...) If you can get so far (...) **to define the idea** and maybe even the contours of a business plan. And the promise of the (...) these guys at least put it in resources and terms of time then it will never be a problem to get the rest financed. Never. Not in the **Danish innovation environment**, it's fantastic.”

TABLE 3

Empirical evidence supporting the findings – responsibility for the region – attracting more skilled people

Evidence from Company A	Evidence from Company C	Evidence from Company D	Evidence from Company E	Evidence from Company F
<p>“I think the bigger companies need to think in those terms anyway cause if there isn’t a growth in the region they really have a problem with getting the right skilled people and getting the right suppliers and stuff like that, so there other things that if you think taking care of the region, but it doesn’t need to be that you give people money but that you make sure that the region has a certain growth. Otherwise, just getting the right skilled people to the area is a task.”</p>	<p>“It could be from the university, it could be from other companies and it could also from networks. I think it’s a focus on small and middle—sized companies in Denmark. Because in big companies they say they have a good time, so it’s a focus on small companies and the work they need, and what I think they need and what we also need</p>	<p>“We don’t have any competitors down here. We don’t have any competitors in Denmark. We only compete on manpower so... I think it should be possible to do some sort of cooperation”</p> <p>“At the moment [our company] is buying some Linux expertise from another company, consulting company. And that’s because [our company] is not big enough to have our own Linux department and we only need that a couple of times every year. So we buy it from another company, which is based on Northern Denmark. And what you could do is that, maybe if we had a group of Linux developers that we could share between</p>	<p>“I think we have [the university] also [one of local clusters] and they have tried to do this project together but I think none of them has really been successful in doing that. So to be honest, I don’t really know (...) what the key to success is. I do not have any (...) of it would be good if you could find it. And we would love to support it. Because the more growth, the more companies the more people that are working (...) in mechatronic engineering in this area, they easier to be attracted via people from outside of region and also to push the university to wake up</p>	<p>“The way it is now you have [large company Y], [company E], xxx, [company H], [large company Z] and maybe a couple of others. And then employees are going (...) “oh I am here for 2 years” and then they go here for 2 years, and they go here for 2 years, and then they go here for 2 years and then (...) then (...) then go to pension. Or maybe they come back. They are rotating already. They know each other already. So, the knowledge is flowing. You cannot do anything. It’s already there. Because people are moving around. (...)”</p> <p>“And I think that [large company Y] has a serious obligation to take charge in terms of funding it. They don’t have to participate a lot, but they should give money</p>

“If actually the **government and the universities** could come up together with projects that could be benefiting the university and the government, but would be put out to the local companies”

is specialized people”

companies locally. Then, we could create new jobs in [our city] and **we could make people stay** in [our city]. [our company] did it a couple of years ago with... We had a mechanical developer we shared with [company A] and it worked quite successfully.”

and do something more for the industry [Laughter] that would be good. It is actually **easier for us to work together with the university.** So I don't really have the key to be honest but I love to have.”

because it's in their own interest. That this education works and that we have (...) a sub culture of supporting industries to [large company Y]. If they don't have that, then the company [large company Y] doesn't have any incentive to be in this region.”

TABLE 4

Empirical evidence supporting the findings – potential collaboration areas

Evidence from Company A	Evidence from Company D	Evidence from Company E	Evidence from Company F	Evidence from Company G
<p>(...) I think you would be able to develop new products. That’s for sure, which there would be needs, could be like I mentioned in the health care region and the universities need the projects anyway. “</p>	<p>“Well, I like the idea about, I mean, sharing knowledge, sharing technology. Not only on, you know, software hardware, but maybe also on processes.”</p> <p>“I don’t know if it’s possible to make a common product because, I mean, we are in different businesses. We have different requirements. (...) And I think that’s going to be one of the challenges for the [regional initiative]. It’s to define this new common product because everybody will have different requirements. And it the end, you will end up with a big list and you will use many many years to develop one product which is going to be too late for the market and too expensive. So I think more on a component level...component, technology, process...”</p> <p>“It could be mechanics. It could be, for instance, qualifying hardware like testing.</p>	<p>“(...) I think it is easier to make cooperation when you have a product that we want to do together. And not only a technology, I think it is a bit more difficult, (...) if you are doing some product development together where all companies, either sub-supplier to main</p>	<p>“But also the area we live in have some unique competences. We have a lot of power electronics industry. We have also actually a low power electronic experience and we have very good software people here. We have a lot of (...) good infrastructure. There is a university,”</p> <p>“ I was blessed with a very special network at the beginning. Not everybody has that. So, maybe (...) some more (...) structure kind of group of companies goes together and say: “Look, let’s put some resources in a brown paper bag and see if they help somebody”. I know it sounds a little crazy but it’s not. Because this kind of activity brings a lot of</p>	<p>“But this is not only work together, they must be chosen some goals here, and if you say we are 5 companies working together (...) next step could be develop the market and you must also have some synergies, and this synergies (...) the next thing are we are interested in the same sale things. Energy, that’s really an area that we have a lot of people here, in this area, smaller companies, they are very deep but very small in portfolio. So if we took the challenge in this</p>

(...) Very few of the companies are competitors in this region. So we are not competing with products, so we are more or less competing with men power. And if **we could share men power** between the companies and we could make this set up where it's cost-effective. I mean, when we had this guy with [company A], they paid half of his salary and we paid the other half. And it's a lot cheaper than hiring an external contractor. And if you could do something similar, it would be a benefit for all the companies that cooperate with. So it could be **certain technologies** or **certain expertise**."

company or supply part of the product then you really have a strong incentive, for doing this"

enthusiasms, willingness, (...) and inspiration, this kind of stuff. They should make grants. The best idea in power electronics - we will help you to build prototypes for free. These are just ideas. But this is one component which maybe missing in terms of getting finance for your business and so on. "

region, together within the university, to put focus on the buildings and energy, so you have much backup and experience to develop positive energy and new solutions which could not only sold in demark but also export, not from one companies, but from the cooperation of the companies."