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Cluster initiatives as intermediaries: *A study of their management and stakeholders*

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2015

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ABSTRACT

This dissertation offers a platform to understand the nature of cluster initiatives as a socio-economic phenomenon combining cluster, entrepreneurship and intermediary features. They are particular types of ventures facilitating networks and dialog platforms adjusted to local contexts and offering a way to enhance regional development. The success of clusters and regions is shaped by the degree they are based on and involve entrepreneurial activity, which is viewed here under the prism of cluster initiatives. This dissertation uses both qualitative and quantitative approaches to study various organizational aspects of cluster initiatives and their intermediary role as well as providing recommendations for the management and support of these organizations. It is based on five papers written by the author of the dissertation solely and in collaboration with other scholars where the level of analysis is focused on cluster initiatives. Based on empirical material from the papers this dissertation brings together both the structural and organizational content of cluster initiatives by providing evidence in the areas of actors and relationships, mode of organization and intermediary specific, assessment and management as well as policy.

This work has generated the following conclusions: firstly, cluster initiatives represent organizations bringing together a four-faceted constellation of interrelated actors (i.e. the initiative itself, key player, support and target group), through organization of intermediary activities. Secondly, these organizations are organized as temporary projects, but being able to attract many members and to satisfy their needs through diversified and innovative activities can help them to achieve longevity. The longevity of initiatives can also be supported by policy, which in order to become effective, should include a long-term perspective and bottom-up approach. And finally, the study proposes a model of five central qualitative success factors to be used for the assessment and management of the initiatives, which together depict a holistic picture of their functioning. This model contains elements such as idea, driving forces, activities, organization and critical mass. The two models of interrelated actors and of success factors form the main contribution of this work. Extending the stream of studies this dissertation raises awareness and calls for recognition of cluster initiatives as important actors working in-between the boundaries of other organizations and institutions.

Key words: Cluster, cluster initiative, intermediary organization, regional development, entrepreneurship, success factors, actors/stakeholders and activities.

SAMMANFATTNING

I dagens samhälle finns det olika former av samverkan mellan företag och organisationer i syfte att främja regional utveckling och entreprenörskap. I denna avhandling studeras en form av samverkan som i denna studie benämns klusterinitiativ. Dessa består av olika aktörer som samverkar för att uppnå konkurrensfördelar, ofta inom ett begränsat geografiskt område och med fokus på att utveckla exempelvis en viss bransch eller en viss typ av företag. De är en speciell typ av satsningar som skapar nätverk och dialogplattformar anpassade till lokala sammanhang och erbjuder ett sätt att stärka den regionala utvecklingen. Exempel på väl kända klusterinitiativ i Sverige är UppsalaBio, PaperProvince och SMIL.

I denna avhandling används både kvalitativa och kvantitativa metoder för att studera olika organisationsaspekter av klusterinitiativ och deras intermediärskap samt för att ge rekommendationer för ledning och stöd av dessa organisationer. Inom ramen för detta studeras dels olika aktörskonstellationer och hur dessa utvecklas över tiden, klusterinitiativets roll som intermediärer, framgångsfaktorer för klusterinitiativets verksamhet samt policyaspekter. Studien baseras på fem artiklar skrivna både enskilt av författaren och tillsammans med andra forskare. Avhandlingen har genererat följande slutsatser: klusterinitiativ kan betraktas som en intermediär där fyra typer av relaterade aktörer (klusterinitiativet självt, nyckelaktör, support och målgrupp) går samman, utbyter erfarenheter och deltar i nätverksaktiviteter. Dessa organisationer startas ofta som ett projekt på tillfällig basis, men kan uppnå framgång och bli långsiktiga satsningar om de finner tillräckligt med medlemmar och utvecklar innovativa aktiviteter av intermedierande karaktär. Studien visar även på att framgångsfaktorer kan användas för att leda och analysera klusterinitiativets verksamhet. Dessa är kopplade till både medverkande personer och aktörer såväl som genomtänkta och förankrade aktiviteter bland klusterinitiativets medlemmar.

I avhandlingen diskuteras också policyimplikationer för klusterinitiativ och regional utveckling. Bland annat föreslås att policyer bör vara långsiktiga, utgå från den lokala nivån och vara stödjande snarare än detaljstyrande. Avslutningsvis föreslås några intressanta områden för framtida forskning: 1) interaktiv forskningsansats där medlemmarna bjuds in i forskningsprojekten 2) jämförande studier mellan klusterinitiativ i olika länder för att analysera skillnader i kultur och policyer och 3) betydelsen av aktörsroller och samverkansfunktioner inom klusterinitiativets kontexter.

ACKNOWLEDGEMENTS

Every person chooses his or her own journey through life, which helps to form their individual understanding of the world and the things happening within it. My choice for an academic career journey was made long ago - in my childhood when I wished to become a knowledgeable and well-known professor (as my grandfather was). Observing my grandfather helped me to realize that a teacher/researcher was the profession closest to my heart and the one leading the development of the world through research and the sharing of these results with the wider community. This was a driving force behind my dissertation, which is not a final goal, but, rather, an important step in moving me closer to the achievement of my final vision.

The first step towards the realization of my dream was the move to Sweden. There I met Mike Danilovic, Leona Achtenhagen, Veronica Gustavsson, Tomas Müllern, Ethel Brundin, Helen Anderson – my teachers and coaches in Jönköping International Business School. These people demonstrated the value of good research from the European perspective and provided me with the possibility to take my first individual research steps. I will never forget your help and support in achieving my goal – to continue an academic career. Thank you for pointing the ‘way in life’ and your just-in-time instructions. You have all contributed towards raising my interest in the subject of innovation and business creation.

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THE STATUS OF DISSERTATION PAPERS

Papers	Status	Source
Paper 1: Inessa Laur, Magnus Klofsten & Dzamila Bienkowska. 2012. Catching Regional Development Dreams: A Study of Cluster Initiatives as Intermediaries.	Published on-line	European Planning Studies 20 (11): 1909-1921.
Inessa Laur & Alain Fayolle. 2015. Understanding Cluster Initiatives in Europe: Uniqueness and Contextuality, in <i>Sustainable Development in Organizations - Studies on Innovative Practices</i> , in Elg, M., Ellström, P.-E., Klofsten, M. & Tillmar, M. (eds.). HELIX VINN Excellent Centre. (Forthcoming).	Book chapter N16	Chaltenhem: Edward-Elgar Publishing: 275-298. Expected in 2016
Paper 3: Inessa Laur, Magnus Klofsten, Dzamila Bienkowska, Joakim Wincent & Håkan Ylinenpää. 2015. Cluster Initiatives within the European Context: Intermediary Actors and Development Process.	To be re-submitted	European Planning Studies
Paper 4: Magnus Klofsten, Dzamila Bienkowska, Inessa Laur & Ingela Sölvell. 2015. Success Factors in Cluster Initiative Management: Mapping out the 'Big Five.'	Published on-line	Industry and Higher Education, 29(1): 65-77.
Paper 5: Inessa Laur. 2015. Cluster Initiatives within the European Context: Stimulating Policies for Regional Development Dreams, in: <i>New Technology-Based Firms in the New Millennium</i> , Groen, A., G. Cook, & P. van der Sijde (eds.).	Book chapter N8	Howard House: Emerald Group Publishing Limited: 147-170

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PART I: SYNTHESIS

1. INTRODUCTION

This chapter discusses clusters, cluster initiatives, and ways in which they differ to set the stage for the focus of this thesis: cluster initiatives. Using an example, a definition, and an examination of the research that describes these entities and their character, this introduction then discusses potential knowledge gaps in the understanding of cluster initiatives before introducing the aim of this thesis and presenting the research questions. A short description of the remaining chapters concludes this section.

Why study cluster initiatives?

Since the beginning of this century, but with seeds first sown in 1991 and the ratification of the Maastricht treaty, one objective of the European Union has been a competitive and knowledge-rich economy supported by regional development (OJEC, 1992). In response, two-thirds of European countries now actively support entrepreneurship and clustering as a means of promoting economic growth and competitiveness (OECD, 2009). Such a policy program develops local competences, stimulates innovative ideas, improves interactions between regional and international actors, and supports knowledge exchange (Barca et al, 2012). Considered as flexible phenomena, clusters and entrepreneurship are easily adapted to the local setting (Porter, 1998; 2001; Singh, 2003; Sölvell, 2009). They are often seen as valuable contributors to regional innovativeness and competitiveness that produce new jobs, cutting-edge technological progress, and improved institutional settings, which further induce venturing and collaborations (Rocha, 2013). Examining the synergistic combination of cluster and entrepreneurship phenomena might provide regional authorities insight into ways of organizing economic activity that will engender dynamic economic performance (Audretsch, 2013).

In the synergies mentioned above, the parts are deeply interdependent: the impact of clusters depends directly on the quality of the entrepreneurial activity, and vice versa, the effect of entrepreneurship is greater when entrepreneurs act in clusters instead of alone (Delgado et al, 2010). Various regions in which cluster flourishes have achieved world renown, for example, Bollywood in India, the Colchagua wine cluster in Chile, and the Bionics Competence Network (Biokon) in Germany (Bell & Giuliani, 2007; Seliger et al, 2008; Lorenzen, 2009). Such success, however, does not always follow in the wake of the cluster phenomenon: other regions have failed to achieve similar strides in growth (Boekholt & Thuriaux, 1998; Roelandt & den Hertog, 1999; Feldman & Francis, 2004). In Stockholm, Sweden, for example, the TIME cluster initiative (focused on telecom, IT, media and entertainment) closed down due to retraction of support from its main stakeholder, despite continuing interest on the part of other stakeholders (Laur et al, 2012). Thus, no one-model-fits-all solution to inspiring economic performance exists; nearly always, benefits arise only when well-known practices are first adapted to the local context before being implemented (Etzkowitz, 2002; Tödtling & Trippl, 2005; Asheim & Coenen, 2005). Still, researchers anticipated that more concrete evidence might explain differences in regional development. Research interest targeted an understanding first of the seed from which the most successful regions grew and then of techniques for implementing similar paths in other regions (Edquist et al, 2002; Singh, 2003). This led to studies on clusters and

entrepreneurship, which go hand-in-hand with each other (Rocha & Sternberg, 2005; Delgado et al, 2010).

More recent studies of clusters have begun to investigate the entrepreneurial and intermediary activities that occur within clusters in e.g. incubators, development agencies and other facilitating organizations (Ketels & Memedovic, 2008; Ketels, 2013a; Ebbeknik & Lagendijk, 2013). Such organizations tend to be tightly linked to local contexts and to boost cluster development (Arthurs et al, 2009; Inkinen & Suorsa, 2010; Lindqvist et al, 2013). One or several such organizations, supported by regional actors (further can also be named stakeholders) from diverse spheres such as academic, public, and business, are potentially able to rescue a cluster or a region (Arthurs et al, 2009). Thus, well-known cluster and regional development policies can be adapted specifically to a particular territory (Leydesdorff & Etzkowitz, 1996; Mills et al, 2008; Garcilazo et al, 2010; Barca et al, 2012). The platforms created by these organizations allow experiences and networks to be streamlined and shared; in other words, the platforms offer a way of replicating success (Karaev et al, 2007; Visser & Atzema, 2008).

Thus, one type of facilitating or intermediary organization that has arisen in the wake of the clustering phenomenon is the cluster initiative (Sölvell et al, 2003; Ketels & Memedovic, 2008). Some view it as a product of the development of clusters, which plays a role as clusters facilitator (Sölvell et al, 2003; Ketels & Memedovic, 2008). Cluster initiatives are widely known for their strong entrepreneurial spirit and collaborative focus, which in the end might revitalize regions (Sölvell, 2009; Ketels et al, 2006). Initiatives operate in dynamic settings and create favorable conditions that allow active members to improve their performance. Over 400 million persons start and lead new ventures each year globally (Austenå, 2011; Rocha, 2013). Some of these persons are cluster initiative entrepreneurs whose aim is to develop the focus industry as well as the area of their operations through facilitating collaborations and employment growth (Kelley et al, 2012, Delgado et al, 2010). Their objectives include, but are not limited to, contributing to public wealth through enhancing clusters; delivering benefits to businesses (e.g., by providing access to interactive platforms, initiating partnerships with academia and with business and public organizations, and facilitating the translation of research into practice); and building own reputation through excellent service offerings and operational longevity (Bennet & Robson, 2000; Hallencreutz & Lundequist, 2003; Mattsson, 2007; Bergek & Norrman, 2008; Hanusch et al, 2009, Royer et al, 2009).

These objectives are what allow cluster initiatives to be described as professional organizations delivering services and what differentiate them from and make them more attractive than traditional network organizations (Rosenfeld, 1996; Bennett & Robson, 2000; Provan & Kenis, 2008; Ingstrup, 2010). Cluster initiatives fill existing system gaps by providing intermediary assistance – gaps which otherwise would require the involvement of several different intermediary organizations (Burt, 2000; Etzkowitz & Ranga, 2011). Cluster initiative activity has been identified in at least 39 countries around the world, and the number appears to be steadily growing (Lindqvist et al, 2013). Initiatives tend to operate under the radar of most observers; thus, even minor attention to who they are and what they have achieved encourages their proliferation (Searle, 1995).

Cluster initiatives are associated with positive characteristics. The literature rarely discusses the other side of this phenomenon (cf. Salancik & Pfeffer, 1978); however when it is, it is usually mentioned as an aside in a discussion of cluster limitations. Benneworth & Henry (2004) explain this interchangeable use of the phenomena by high level of appropriation of Porterian cluster and its domestication enabled by creation of other versions of cluster, like the cluster initiative. The cluster initiatives are sometimes considered as clusters and sometimes as separate entities striving to meet the specific needs of clusters. At least three drawbacks of clusters are actively discussed and criticized by scholars: policy lock-in, functional lock-in, and the high specialization of cluster initiatives (e.g. Grabher, 1993; Martin & Sunley 2003, 2011; Hassink, 2005; 2010; Tödtling & Trippel, 2006; Klerxs & Leeuwis, 2008; Kiese & Hundt, 2014; Vicente, 2014). The author of this dissertation views these aspects to be the most crucial for cluster initiatives. However, this list is not exhaustive. Cluster initiative potential is further worsened by a lack of clear strategies for preventing lock-ins and dealing with negative consequences (Martin & Sunley, 2006; Klerxs & Leeuwis, 2008). These limitations, however, do not make cluster initiatives less interesting for research, but rather tease and capture the interest of the researchers by presenting areas where great contributions are possible.

Defining and exemplifying cluster initiative

This dissertation, and the five appended papers, focus on a special phenomenon: the cluster initiative, a type of organization often characterized as a hybrid organization due to the presence of both organizational, intermediating and networking features (Etzkowitz & Ranga, 2011). Several scholars have defined cluster initiatives, and each description emphasizes a particular characteristic; for example, fulfillment of member needs (Hanusch et al, 2009), development of networks, and linking-pin between private and public sectors (Hallencreutz & Lundequist, 2003; Renski et al, 2007; Etzkowitz & Ranga, 2011). The research presented here took these definitions into consideration; however, since the Ketels & Memedovic (2008) definition also addresses these characteristics, but also capturing broader features of a cluster initiative it was selected as the defining description in this dissertation. So, cluster initiatives are entrepreneurially driven hybrid organizations engaged in:

... collaborative actions by groups of companies, research and educational institutions, government agencies and others, to improve the competitiveness of a specific cluster [... for example] by raising the awareness of companies within a cluster and creating more effective platforms for interaction [... or providing] a platform for a better dialogue between the private and the public sector when making decisions about how to improve the cluster-specific business environment. (Ketels & Memedovic, 2008, p. 384).

The multidimensionality of the cluster initiative phenomenon makes a simple definition of this phenomenon difficult. To illustrate this phenomenon, a brief description of Rock City – an inspiring Swedish cluster initiative (cf. Hallencreutz & Lundequist, 2003; Lindgren & Packendorff, 2008).

Rock City, A Swedish cluster initiative

Most Swedes and visitors to this European country know Hultsfred as a small town of around 5,000 inhabitants in the province of Småland (Kalmar County). Hultsfred is widely known for hosting the many annual festivals that attract all generations. Thanks to the Rockparty initiative (1981-2010) and now Rock City (1996 – to present) initiatives, Hultsfred is well known. In 1981, several enthusiastic teenagers who lived for rock music initiated Rockparty to organize concerts for their friends. 29 years ago Rockparty was taken over by Rock City, which is a rather modern form of organization that besides an idea, driving force, and organization displays several other beyond organizational attributes, for example, activities and critical mass of members (Gibb, 1990; Klostén, 1992; Etzkowitz & Leydesdorff, 2000; Lundquist & Power, 2002; Davidsson et al, 2010; Sölvell, 2009). The mix of such different features makes Rock City so multidimensional combining characteristics of different entities and aiming for achievement of broad socioeconomic purposes.

Several factors have contributed to Rock City's success. One is core idea and objectives, which centers on a common interest in music and a willingness to organize music festivals that contribute to the well being of its rural location. Besides a desire to promote the experience industry, the idea behind the cluster initiative included dissemination of modern entrepreneurial methods. Another attribute of modern organizations is high motivation with a sense of responsibility. The entrepreneur and team who have led Rock City since its initiation in 1996 have managed to create numerous contacts with various actors and have improved their competencies in areas such as monitoring and marketing through organization of a complex set of activities (workshops and teaching events, the Business Lab incubator, networks, and provision of conferencing facilities). These intermediary activities define the Rock City cluster initiative and its team, which also includes the network members. Another organizational attribute is a threshold number of members. Rock City has more than 50 active members comprising a diversified group of actors (i.e. stakeholders) with various backgrounds, experience, and knowledge – a feature that is indispensable for knowledge exchange and learning. Rock City's valuable contribution to the prosperity of the region has accrued the active support of regional authorities, and the cluster initiative has become a vital networking partner and an intermediating agent for businesses and academia in the experience industry. This type of organization, which Rock City exemplifies, is the focus of this dissertation.

Potential knowledge gaps in understanding cluster initiatives

Review of current research shows that scholars and policymakers often underestimate and misunderstand cluster initiatives (Lindqvist et al, 2013; Mills et al, 2008; Moss et al, 2009). According to the above mentioned definition cluster initiatives are entrepreneurially driven organizations aiming to bring together actors/stakeholders in the academic, public, and business spheres in a common geographical space by offering services in a set of intermediary activities. These organizations are hybrid entities, which must be treated in a different manner than for example clusters and networks, which tend to promote both of the latter.

Proper understanding of the organization and functioning of these entities requires accurate, relevant knowledge. However, there are a number of potential knowledge gaps, which prevent a proper understanding of the impact that cluster initiatives have on regional economics. These potential knowledge gaps can be classified into four problematic areas: conceptual, theoretical, empirical, and policy (adopted from Rocha, 2013). Such knowledge is seeded in classical organization and small firm theories, but also in more recent cluster, entrepreneurship, and intermediary models. There is great value in understanding the internal processes and connecting these with the external environment surrounding these organizations, such as operations sectors, diverse member involvement, and domain.

One problem in the *conceptual* arena concerns the definition of cluster initiatives, which rests on an understanding of the nature of the phenomenon. The idea is also closely linked with other phenomena like cluster, entrepreneurship, and regional development (Porter, 2000; Markusen, 2002; Wiklund et al, 2011). Varying conceptualizations give rise to, for example, interchangeable usage of clusters and cluster initiatives, and of cluster initiatives and entrepreneurship (Fromhold-Eisebith & Eisebith, 2005; Intarakumnerd, 2005; Hanusch et al, 2009). The most relevant misuse for this thesis is the intermixing between cluster and cluster initiatives, which might be linked with an adherence to old traditions and a slow acceptance of change (Rocha, 2013). This chapter cites several working definitions of cluster initiatives that illustrate this phenomenon and describes various ways of differentiating cluster initiative from other related phenomena as for example presence of an entrepreneur, a vital group of members and that they are satisfied with the ongoing activities. Moreover, the dissertation concludes by highlighting original features of cluster initiatives that could create a basis for a more universal definition of the phenomenon. However, the aim of this dissertation was not to generate one defining formulation, but rather to build an understanding of and describe the broad spectrum of cluster initiative characteristics. Still, the main definition of the phenomenon was chosen in order to establish a starting point for investigation. Apart from this, the distinction of this phenomenon from related ones is highlighted in a detailed way in the theoretical chapter.

In the *theoretical* arena, problems are usually related to the absence of a single set of theories able to capture the uniqueness and originality of cluster initiatives. One set of theories would actually be insufficient; several theory sets are required to adequately capture the uniqueness of initiatives and describe the impact that these organizations have on various organizational, regional, and national levels. For instance, only a few studies investigate entrepreneurial activity and cluster initiatives (Ecotec, 2001; Lundequist & Power, 2002; Klofsten, 2010), only a few scientists have observed links between cluster initiatives and intermediary organizations (Fromhold-Eisebith & Eisebith, 2005; Aziz & Norhashim, 2008), and few researchers endeavor to link the results of cluster initiative activities with achievements on regional and national levels (Rosenfeld, 1996; 2003). This thesis attempts to combine some literature streams – such as cluster initiatives and intermediary organizations, entrepreneurship and innovation, and clusters and regional development – in order to point out further lines of research. Considering these streams jointly may produce valuable research results and improve reflections on what is really happening.

In the *empirical* arena, one problem is often a lack of data, especially sizeable quantities of data, which could be used to detect commonalities; instead, conclusions are too often drawn on the basis of single cases. According to Flyvbjerg: “Single cases are overrated as a source for scientific development. The case study is a necessary and sufficient method for certain important research tasks in the social sciences, and it is a method that holds up well when compared to other methods in the gamut of social science research methodology” (Flyvbjerg, 2006, p. 225). This means that it is possible to use one single case for generalization. However, this might limit the understanding of the cluster initiative organization and its operation from both research and managerial perspectives (Mills et al, 2008). Therefore, it could be fruitful to add data from other methods such as survey studies in order to get a broader picture of the phenomenon. This thesis addresses the problem in depth, discussing the problem of individual cases of cluster initiatives and the advantage of sizeable quantities of data to illustrate in detail organizational patterns and functioning mechanisms.

In the *policy* arena, one problem concerns the effective design and evaluation of policies that support and promote cluster initiatives. This phenomenon is a fairly recent and is more complex than their predecessors. Success in redesigning existing policies – such as policies previously designed to promote clusters and thus facilitate regional development – for application to cluster initiatives may require more profound theoretical and empirical bases as well as clear recommendations. An entire paper in this dissertation is dedicated to generating recommendations for redesigning policies that lack such considerations. Moreover, all other projects in this doctoral work offer recommendations for improving facilitating mechanisms throughout the life-cycle of cluster initiatives.

In summary, the gaps mentioned above might already be addressed in the existing studies however they require deepening and systematization under the combining lens as applied in this work. The research questions generated in this dissertation address these potential knowledge gaps; the conceptual gap, for example, is considered to a lesser degree because it is outside the key scope; however it is necessary as a starting point and for positioning of the thesis. The other three gaps are addressed with the direct purpose to enrich the existing knowledge and provide a systematic picture of the cluster initiatives nature and functioning.

Aim and main research questions

Potential gaps in the current knowledge of cluster initiatives, combined with previous projects in this dissertation, served as a foundation for formulating the thesis aim:

To increase understanding of the organization of cluster initiatives and their inter-mediating role within regional spaces and to develop policy recommendations for the management and support of cluster initiatives.

Definitions of cluster initiatives nearly always list companies, research and educational institutions, public agencies, and financial institutions as initiative actors (Renski et al,

2007; Hanusch et al, 2009; Etzkowitz & Ranga, 2011). Interactions between these actors – their collaborative and reciprocal actions – are central to the functioning of cluster initiatives (Hallencreutz & Lundequist, 2003; Inkinen & Suorsa, 2010). To secure their survival and long-term existence, initiatives require the involvement of a threshold number and variety of such actors. They are sometimes considered the “heartbeats” of cluster initiatives because they are at the center of initiatives, forming their backbone (Aziz & Norhashim, 2008, p. 353). Thus, research on cluster initiatives should always include a discussion of the actors and consider the scope of their influence on all other processes in these organizations.

In most cases, studies on cluster initiatives describe the actors, their function, and what they contribute (Sölvell et al, 2003; Aziz & Norhashim, 2008). Little mention, however, is made of the internal and external parties that actively participate in cluster initiative operations, their inter-relationships, and the benefits derived from their collaborations. Actors with special areas of expertise, hired in for specific tasks, should not be overlooked. This is related to the theoretical gap mentioned above in terms of use of related, but not fully suitable, theories, fuzziness in actor typologies, and exchange patterns between different stakeholders in cluster initiatives. Furthermore, empirical gap mentioned earlier can also be seen as potential source of such partial understanding of cluster initiatives stakeholders. So it is critical to know the types of actors involved, their tasks, and their relations with other members. Research question 1 addresses these topics:

What types of actors are found in cluster initiatives
and how do they interrelate?

Reasons for joining a cluster initiative vary, depending on members’ needs and demands, which tend to change over time (Jurgens et al, 2011). Thus, their roles and the extent of their involvement will also vary; at times, they will be more active, maintaining long-term membership, and at others, less active with periodic involvement. Appropriate management of this feature of cluster initiatives requires a unique organizational setting that monitors members’ needs and supervises their constellations.

Membership composition and cluster initiative aims define the offering of intermediary activities, which the initiative is responsible for organizing and executing, in their intermediary role. Along with the actors, intermediary activities are important organizational elements vital to the functioning and survival of cluster initiatives (Wood, 2002). For initiatives to flourish and be attractive, initiative leaders should continuously interact with members, implement routines for changes, and initiate learning and development programs (Visser & Atzema, 2008; Royer et al, 2009; Turner et al, 2013; Wihlborg & Söderholm, 2013). The literature seldom describes such organizational processes; in particular, there is little information on new member enrolment, changes in membership composition over time, and how intermediary activities are adjusted and prioritized in response to the experiences gathered through practice. The theoretical gap has already mentioned this, observing limitations in presentation of intermediary role and entrepreneurial drive of cluster initiatives along with the empirical and conceptual gaps pointing on little attention on dynamics of these organizations. More insight into these

issues is necessary if the organization and intermediating activities of cluster initiatives are to be understood on a detailed level (Mills et al, 2008; Moss et al, 2009; Lindqvist et al, 2013). Research question 2 addresses these limitations:

How are cluster initiatives organized and how do they intermediate?

Cluster initiatives are complex organizations that vary across sector and country (Waxell & Malmberg, 2007). This profile makes it difficult to define common ways of measuring performance and the influence of members and region on development (Ramsden & Bennett, 2005). However, identifying suitable success factors that reflect initiative operations is important for policymakers, researchers, and managers who wish to assess, promote, and compare these organizations. Many studies that focus on evaluation practice have proposed varying performance indicators, but they do not always capture soft qualities such as entrepreneurial spirit, commitment, and dynamic change (Sölvell et al, 2003). These qualities are the main drivers of development of the initiatives, their stakeholders and surrounded regions – they also assist their organizations to adequately respond on external shocks and remain up-to-date (Klofsten & Jones-Evans, 1996; Kiese & Hundt, 2014). This dissertation, addressing policy and also theoretical and empirical gaps, raises the need to focus on measures capable of describing the entrepreneurial core of cluster initiatives as well as their dynamics, to supplement indicators that are already in use. Research question 3 addresses these:

What types of success factors are identified behind the performance of cluster initiatives?

The past decade has shown that current policy mechanisms no longer promote networking and clustering as effectively as before (Arthurs et al, 2009; Barca et al, 2012; Kiese & Hundt, 2014; Brown & Mason, 2014). This has motivated governments to continue searching for new instruments that facilitate collaborations between various actors and, thus, boost economic development and regional growth. One idea – to support facilitating organizations such as cluster initiatives – has proven valuable in fostering cluster development (Boter & Lundström, 2005). However, policy that targets cluster initiatives has been lumped into the cluster policy block, which is broad and fragmented (Andersson et al, 2004; Vicente, 2014). They for example hardly take into consideration the differences between regions and the presence of less favorite regions as well as different networking capabilities and absorptive capacities of firms (Tödtling & Trippel, 2005). Such policy does not effectively stimulate the emergence of initiatives and hardly supports their growth and development as also mentioned above in policy gap influencing understanding of these organizations (Diez et al, 2001; Martin & Sunley, 2003; Arthurs et al, 2009; Swords, 2013; Brown & Mason, 2014). One focus of this dissertation is to propose recommendations for improving policies that will regenerate entrepreneurial activity for launching cluster initiatives and to drive their further development. Research question 4 addresses this focus:

What policy implications can be formulated for
research and practice with regard to cluster initiatives
management?

This dissertation builds on four recurring questions: what, how, why, and what for guiding the entire research process from its start up to now (Paul, 1992; Singleton & Straits, 1999). Answers to these questions provide the picture of multidimensional, multilevel nature of cluster initiatives. According to Paul (1992), answering these questions would generate a better understanding of the phenomena being investigated and mastery of their content. Research questions 1 and 3 are of the “what” type; the intention is to refine definitions, to describe the main content and constituents of the phenomenon, and to identify its effects (Singleton & Straits, 1999). In this thesis, the main phenomenon is the cluster initiative and the constituent elements are the actors and success factors. Research question 2 is of the “how” type; it analyses relationships: internal within cluster initiatives and external between the initiative and their networks. This also illustrates patterns of initiatives’ intermediation. A large dataset is used in the analysis. The intention of the first three questions is to build a basis for understanding by describing and explaining. Research question 4 is of the “what for” type and prescribes recommendations for policy actors, proposing improved ways of controlling, changing, and facilitating economic performance. The “why” type of question is more implicit and not a separate research question; the question of why is the foundation and driving force of each of the research questions. This “why” question is stated for the understanding of interrelationships and linkages in this study, but also for finding out the potential pre-requisites of certain occurrences as for example what led to the start of cluster initiatives and its ongoing activities.

These research questions will contribute to the research on entrepreneurship and innovation as well as practice by (1) providing insight into the typology, roles and relationships of actors involved in cluster initiatives and proposing an actor model, (2) combining the fields of entrepreneurship, cluster and organization to generate a portfolio of suitable and well-covering principles for cluster initiatives, (3) proposing a model for assessing cluster initiative performance, (4) shedding light on patterns of development and growth in terms of membership composition and maturity, and, lastly, (5) suggesting policy improvements. The last contribution in particular concerns the effective achievement of regional development goals. Thus, the thesis aims to meet the conceptual (1,2), theoretical (1,2,3,4) and empirical (1, but also behind all contributions) as well as the policy (3,4,5) knowledge gaps identified in the dissertation.

Table 1 illustrates how the four research questions relate to the five papers in this thesis (the cross represents main focus of the paper). For example, Paper 1 corresponds with Research question 1 while Papers 2 and 3 also partially address this question, providing additional valuable information. Papers 2 and 3 discuss Research question 2 in full. Thus, the first three papers are complementary and contain a complexity of information on how cluster initiatives are organized, how they intermediate, and who the involved actors are. The scope of Papers 4 and 5 is more specific; each paper addresses only one research question. The five papers follow a chronological line of thought and questioning: to better

understand the last two papers, the first three papers should be read first. A more detailed discussion connecting the research questions and the papers is presented in chapter 4.

Table 1: Research questions and papers: how they relate to each other.

Research questions	Paper 1	Paper 2	Paper 3	Paper 4	Paper 5
1: What types of actors are found in cluster initiatives and how are they interrelated?	X	X	X		
2: How are cluster initiatives organized and how do they intermediate?		X	X		
3: What types of success factors are identified behind the performance of cluster initiatives?				X	
4: What policy implications can be formulated for research and practice with regard to cluster initiatives management?					X

Paper 1: Inessa Laur, Magnus Klofsten & Dzamila Bienkowska. 2012. Catching Regional Development Dreams: A Study of Cluster Initiatives as Intermediaries. *European Planning Studies* 20 (11): 1909-1921.

Paper 2: Inessa Laur & Alain Fayolle. 2015. Understanding Cluster Initiatives in Europe: Uniqueness and Contextuality, in: *Sustainable Development in Organizations - Studies on Innovative Practices*, in Elg, M., Ellström, P.-E., Klofsten, M. & Tillmar, M. (eds.). Chaltenhem: Edward-Elgar Publishing: 275-298. (Forthcoming).

Paper 3: Inessa Laur, Magnus Klofsten & Dzamila Bienkowska, Joakim Wincent & Håkan Ylinenpää. 2015. Cluster Initiatives within the European Context: Intermediary Actors and Development Process. *European Planning Studies*, (to be re-submitted).

Paper 4: Magnus Klofsten, Dzamila Bienkowska, Inessa Laur & Ingela Sölvell. 2015. Success Factors in Cluster Initiative Management: Mapping out the 'Big Five.' *Industry and Higher Education*, 29(1): 65-77.

Paper 5: Inessa Laur. 2015. Cluster Initiatives within the European Context: Stimulating Policies for Regional Development Dreams, in: *New Technology-Based Firms in the New Millennium*, Groen, A., G. Cook, & P. van der Sijde (eds.). Howard House: Emerald Group Publishing Limited: 147-170.

Relevance

The work presented here should be useful for entrepreneurs, who are aiming to start or are in the process of initiating a cluster initiative; managers, who are dealing with day-to-day operations in cluster initiatives; sponsors/other stakeholders; and policymakers on regional and national levels. The results of this research hopefully make valuable contributions by equipping users with knowledge of the mechanisms of cluster initiative organization, functioning, and management. By providing a well-suited monitoring tool for managing challenges in the initiatives, this dissertation also hopes to influence practitioner and policymaker behavior. Rather than 'do it as it has always been done' – applying traditional small firm management techniques – a monitoring tactic may encourage other actors/stakeholders to stimulate cluster initiatives' growth and development in more effective ways. This action may even be a step toward theory building (Rocha, 2013). As a consequence, cluster initiatives might become more independent and thus more insulated from the shocks of the outside economic world – for the well-being of entrepreneurial endeavor and innovation (Autio & Klofsten, 1998; Ylinenpää et al., 2003). In addition, the insights into the dynamic approaches occurring in cluster initiatives that this dissertation describes support establishment of a novel view of the stakeholders involved in these

entities. They can no longer be viewed as static ivory towers, but parties initiating and actively involving themselves in the changing patterns of action and exploiting the results of change trials.

The emergence of such a new organizational form as the cluster initiative is the impetus for generating new theories and providing suggestions for improving and re-evaluating policies. The author of this dissertation sees the appearance of cluster initiatives as an opportunity to contribute to understanding of these organizations as well as policy refinement for better management and support of such initiatives. For practitioners and stakeholders, such input may potentially be a way of achieving a return on their investments over time and a reason for planning new collaboration activities. For regional representatives, this input could be helpful in achieving high growth and increasing regional competitiveness and visibility in the international arena. And lastly, for the theorists, this work is a knowledge platform with the potential for further contributions and development. So depending on their aims, actors support cluster initiatives in various matters in order to – for the overall good of society – prolong the existence and improve the functioning of clusters and cluster initiatives.

The following chapters present, in this order: a literature review, methodology, main findings and their synthesis (discussion section), and conclusions. The literature review describes historical roots and builds a further understanding of cluster initiatives and their interrelationships with other key concepts. The research methodology overview describes the data collection process, the databases, and the process of unifying the individual papers. The next chapter then synthesizes the main results, and a concluding chapter answers main questions, raises important contributions of this work and proposes areas for future research.

2. LITERATURE REVIEW

This chapter discusses the emergence of clusters and cluster initiatives on the industrial scene and their historical development. It also provides insights into how these phenomena are related. The chapter concludes by discussing recent interpretations of these phenomena, including their nature, patterns of launching, modes of organization, and attributes conducive to longevity and growth.

Historical development of clusters and cluster initiatives

The emergence and historical development of clusters

Businesses, governments, and academic institutions use regional clustering – geographically concentrated cooperation – as a survival strategy in the increasingly competitive world they currently face. Clusters have become an important attribute of regions where attractiveness is reinforced by collaboration and competition among regional, national, and international organizations (Marshall, 1921; Dahmén, 1950; Porter, 1998; Johannisson et al, 2007; Caldari, 2007; Ebbekink & Lagendijk, 2013). The coexistence of competition and collaboration, a paradox, seems to be beneficial for the cluster as a whole, as the following inspiring examples illustrate: Bollywood (India), Cleantech (Denmark), Kista Science City (Sweden), Aerospace Valley (France), the Blue Maritime Cluster (Norway), BioWin (Belgium), the Media Park (Hilversum, Netherlands), and Silicon Fen (UK). The literature identifies numerous potential factors in cluster formation, such as access to natural resources, or closeness to trading routes or rivers; the presence of numerous companies and universities for anchoring business spin-offs and attracting investment; and the drive of regional leaders (Cooke, 2002; Ketels, 2003; 2013b). In some cases, however, no clearly visible prerequisites for clusters were discernible, other than perhaps, proximity.

The cluster notion is not new – scholars like Marshall (1921) and Dahmén (1950) discussed the paradox of competition and collaboration co-existing within a region. Notions of *industrial district* and *development block* are points of departure in all cluster research. Such districts focus on localizing small and similar businesses within a geographical space (Marshall, 1966, p. 225). Marshall mentions important features of industrial districts such as labor supply, information and communication, presence of subsidiaries, ability to attract specialized competence, and promotion of innovation. Similarly, development blocks focus on close relationships between two parties, such as a company and a client, that lead to development of new technology (i.e. innovation). Dahmén (1950) characterized new technology as an achievement of several actors with sufficient financial backing, which inspires new investment initiatives. This was considered a good basis for economic growth. The focus on mass production and predictable markets at that time, however, did not direct interest toward Marshall's and Dahmén's works; this occurred only after several decades (Amin, 2001). In the late 1970s, due to the liberalization process, the oil crisis (1973), and the IT revolution (development of the microprocessor), focus switched from large firms and mass production to independent, firm-based and network-focused systems (Storper & Scott, 1989). Already existing clusters and industrial districts gained international attention, and economic, institutional, and geographic consequences started shaping our current understanding of clusters.

Ideas promoted by the three most active schools of thought at that time – the Italian School, the Flexible Specialization Approach, and the California School – have shaped our understanding of clusters (Rocha, 2013). The Italian School was based on the idea of a community of firms and the performance of each district tenant (Becattini, 1990). Achievement of regional performance depended on sociocultural features: territorial and historical (Pyke et al, 1990). The Flexible Specialization Approach recognized that small firms and their collaborative activities with other actors were a source of agglomerations that led to growth and employment (Piore & Sabel, 1984). Looking at examples from West Germany, the Flexible Specialization School realized that learning and the presence of specific institutions also had a positive effect on agglomerations (Storper, 1997). The California School appreciated the value of agglomerations, but in economic terms: inter-firm transaction costs were reduced. Like the other two schools, they believed in trust and knowledge exchange between firms, while also supporting the importance of cross-sector agglomerations (Scott, 1988; cf. Dirks & Ferrin, 2001).

The next wave in cluster research occurred in the early 1990, when globalization and technological change began to replace previous local and regional exchange mechanisms between actors (Held et al, 1999; Longhi & Keeble, 2000). The scholars either developed an economic externalities path, as introduced by Marshall (1921), or a socioeconomic path, where culture, institutional settings, and network paradigms were the main focus (Powell, 1990). Following the Marshallian path, Porter evolved *competitiveness theory* (1990) and Krugman, *new economic geography* (1991). The socioeconomic path led to *innovation milieu* (Maillat, 1996), the *Nordic school of innovation and learning* (Malmberg & Maskell, 1997, Lundvall & Maskell, 2000), the *geography of innovation approach* (Audretsch & Feldman, 1996), *open innovation* (Chesbrough, 2013), *regional innovation systems* (Cooke, 2002; Edquist et al, 2002; Asheim & Coenen, 2005; Inkpen & Suorsa, 2010), and the *cultural-institutional approach* (DiMaggio & Powell, 1983; Saxenian, 1994). The ideas of these scholars are not going to be discussed in detail, but rather used as support for forming discussion chapters and are mentioned in short in the following section.

Porter theory and further development

Porter's competitiveness theory relies to a large extent on two elements. One is what has become known as the Diamond Model. The model is a tool that a country may use to assess sources of competitive advantages of one of its industries, and it can help a nation realize its potential in global competition. The Diamond model consists of four components: factor conditions; demand conditions; related and supporting industries; and a firm's strategy, structure and rivalry. According to the model, the interactions between these aspects create a strong business environment that allows both innovation and competitiveness to occur (Porter, 1990, 1998).

The other important element of competitiveness theory is geographical dimension, in particular co-localization and networking (Porter, 1998). In this context, competitiveness theory highlights clusters as a phenomenon that explains territorial agglomeration and enables long-term competitiveness in specialized industries (cf. Malmberg & Maskell,

2002). Cluster is thus a well-proposed and widely used approach for designing regional development policy (Lagendijk & Cornford, 2000; Delgado et al, 2010).

The cluster idea has evolved from a concept of firm-based strategies to one of broader regional development approaches (Sölvell, 2009). Cluster becomes a model describing geographically concentrated systems of production, containing numerous players who support companies with complementary core products and develop similar enabling technologies in a region. In contrast, Krugman's new economic geography (1991) focuses on economies of scale and adopts many of Marshall's postulates, like division of labor, knowledge spillovers, and presence of subsidiary industries.

Instead of exploring economic externalities, the socioeconomic path concentrates on territorial, sociocultural specifics and networks and considers these more important than economic and technical factors. Notions such as embeddedness (Granovetter, 1985), social networks (Powell, 1990), and social capital (Coleman, 1988; Putman, 1993) have received the main emphasis. Furthermore, innovation and learning have begun to be viewed as key mechanisms for spurring regional development (Cooke, 2002; Asheim & Coenen, 2005) as well as academia has become one of the drivers of these mechanisms (Keeble & Wilkinson, 2010). However, all these ideas and findings have met with strong critique. For example, Zucker et al (1998) state that actors do not necessarily need to be locally embedded to foster innovations; Audretsch & Stephan's (1996) study underlines that 70% of knowledge is formally transferred and that geographic proximity plays a minor role; and Rallet & Torre (1998) highlight organizational proximity as being more contributive than the geographic (cf. Marin & Sunley, 2003; 2006; Hassink, 2010; Brown & Mason, 2014).

The current view of clusters is rather complex, and includes various forms of cooperative initiatives and competitive strategies that often occur within and beyond a regional territory (Hospers & Beugelsdijk, 2002; Delgado et al, 2010; Swords, 2013). Around the turn of this century, scholars began to characterize clusters in three dimensions: geographical (territory of operation), vertical (supplier-customer chains), and horizontal (competing and cooperating agents). Specific attention was being given to knowledge and information exchange; research and development; training; and the interplay between private, public and academic spheres, known as the Triple Helix model (Etzkowitz & Leydesdorff, 2000). Further, clusters had previously emerged spontaneously, driven by advantages such as lower transaction costs, in the wake of local tradition and pure entrepreneurial effort without government intervention (Maillat, 1996). Now, governments are initiating cluster policies to facilitate cluster development as a means of promoting regional competitiveness and growth (Lagendijk & Charles, 1999; Bennett & Robson, 2000; Boter & Lundström, 2005; Ramsden & Bennett, 2005; Perry, 2007; Inkinen & Suorsa, 2010; Kiese & Hundt, 2014).

Policy intervention was needed in order to pursue cluster policies that eliminated barriers to cooperation, like fear of free riding, of knowledge spillovers, and of uncertain returns from cooperation. Authorities also paid specific attention to brokering (or, intermediation), which is considered the motor, facilitator, and driver of collaborations between different public, private, and academic actors (Mignon, 2014). Initiatives to organize

intermediary agents include financial support, provision of working places and facilities, and access to competence pools (Sölvell et al, 2003; Andersson et al, 2004; Inkinen & Suorsa, 2010; Vicente, 2014). Cluster initiatives can be seen as an example of such an intermediary agent organized with the support of authorities (Lindqvist et al, 2013). Here rises the question where the idea about such agents came from. Therefore, the next section introduces the first published sources mentioning such hybrid forms of organizations, which led towards their further emergence.

The emergence and historical development of cluster initiatives

Ostrom shared the 2009 Nobel Prize in Economics for her work on collective action and governance of the commons, such as fishing grounds and mountain meadows. Ostrom's commons (1990) share many characteristics with cluster initiatives, for example, modes of governance (from within and outside), collective decision-making, and problem solving. There are also differences between these, for example, in formation and collaboration processes. Commons are established entities, but cluster initiatives emerge in conditions of unfulfilled needs and demands. Moreover, commons are discussed through the prism of cooperation between individuals while initiatives focus mainly on collaborations between firms and other institutions. Despite these rather minor differences, commons can be regarded as the forerunners of cluster initiatives.

A decade later, Feser (1998), summarizing old and new cluster theories, lays forth with regard to a novel view of clusters as entities revitalizing regions that are lagging behind economic development. This regional focus raised interest among policymakers to intervene and create supporting mechanisms for the venturing and development of clusters. Thus, new cluster theory represented these mechanisms as hybrid clusters, cluster-like organizations, or as we now like to call them, cluster initiatives (Sölvell & Williams, 2013). This, rather implicit, representation of cluster initiatives has defined the path of their further development. In 2003, Sölvell et al published "A Cluster Initiative Green Book," which describes cluster initiatives as entities emerging from within clusters. The book was based on a large dataset of numerous cluster initiatives around Europe, and the dataset has spawned other publications by Sölvell or by Ketels and Lindqvist, the co-authors (Ketels, 2004; Ketels & Sölvell, 2006). In late 2013 Lindqvist et al published a second edition of the Green Book. It updated the picture of cluster initiatives, but with fresh statistics to describe their activities. The book revealed that a large share of member firms attributed much of their new product and service development and enhanced sales to their membership in cluster initiatives (Lindqvist et al, 2013). The book also defines several gaps that led to cluster initiative formation: research gaps between firms and academia, education gaps between firms and education organizations, capital gaps, governmental gaps between firms and authorities, firm-to-firm gaps, cross-cluster gaps (interactions with firms from other sectors), and global market gaps (interactions with global actors and value chains). Cluster initiatives bridge these gaps by bringing together business, government, and academic actors.

Between Sölvell et al (2003) works and the second edition (2013), several pivotal studies appeared in the scientific journals. Ketels and Memedovic (2008) published an article on cluster initiatives in which they conceptualize clusters and cluster initiatives and establish

these as facilitators of economic development. The second, a newer study published by Sölvell & Williams (2013), was dedicated to cluster commons, which aim to bridge innovation gaps in clusters. Commons were beginning to be seen as white spaces between actors “just like a meadow close to a group of farmers” (Sölvell & Williams, 2013, p. 8). The study was based on a new dataset of 12 Swedish cluster initiatives. A study by Nordensky (2009) providing a deep insight into 39 Swedish examples of cluster initiatives and Swedish Agency for economic and regional growth rapport (2010) with description of nine initiatives should not be forgotten.

Other studies on cluster initiatives were published during this period, but for the most part, the authors were rooted in the fields of innovations and regional development. For example, Hallencreutz & Lundequist (2003) reported empirical evidence from Sweden on cluster initiatives’ existence and pattern of operations and recommended improvements in policy practices (cf. Inkinen & Suorsa, 2010). Rosenfeld (2005) emphasized initiatives as economic developers supporting agglomerations, increased knowledge flows, and learning (cf. Hassink, 2010). Fromhold-Eisebith & Eisebith (2005) championed top-down approaches in policies dedicated to cluster initiative funding and for more effective cluster support policies (cf. Swords, 2013). Kovarnik (2005) went further and characterized cluster initiatives as contributors to broadening the European Union. Aziz & Norhashim (2008) drew interesting, metaphoric comparisons of cluster initiatives with human health and the human body. Cluster initiatives – human bodies – assured the “continuum and dynamism” – human health – of regions (Aziz & Norhashim, 2008, p.360). Carayannis & Borowik (2011) discussed the role of cluster initiatives in regional development, describing how they assist enterprises in becoming more innovative and competitive. None of these scholars mention cluster initiatives as such (referring instead to innovative networks, inter-firm networks, or clusters), but the features characterizing the organizations in their studies seem to be identical with the phenomenon studied in this thesis.

By 2009, two-thirds of European countries had implemented cluster policies (UNIDO, 2009) and were funding cluster initiative venturing in various sectors. Data from the 2012 Global Cluster Initiative Survey mapped more than 500 cluster initiatives in Europe, North America, New Zealand and Australia. Most of these tended to be in technology intensive areas and supported relations between multiple actors (Sölvell et al, 2003; Lindqvist et al, 2013). These features make these similar to the intermediaries or supporting organizations (Rosenfeld, 2005; cf. Kock et al, 2012) that are discussed in the following section.

Roots of intermediary organizations and their interrelations with cluster initiatives

Intermediation has its parallel in the natural sciences, which describe chemical reactions between substances. So from a social science perspective, intermediary organizations can be viewed as special organizational forms occurring between others of the same or different type (Van der Meulen et al, 2005; Moss et al, 2009). Brokering was previously discussed in a proximity context where it was depicted as a link between buyer and seller, a link to specialized repair facilities, and a way to reduce the risk of entrepreneurship and gain access to better information (Isard, 1956, Vernon, 1966). On this basis, Callon (1991) rather broadly describes intermediaries as relationships between consumer and producer and between employer and employee; their description also includes non-human artifact

mediation between these actors, for example, articles, software, and contracts. Stewart & Hyysalo (2008) present more focused, but still wide-ranging, examples of intermediaries as retailers, media companies, and consultants.

Why did intermediary organizations appear? Klerkx & Leeuwis (2008) define four gaps underlying the formation of intermediaries: cognitive (large distance between organizations and institutions in different sectors that have produced similar accomplishments), information (lack of knowledge about potential partners and their possible contribution), managerial (inability to acquire and implement new knowledge), and system (poor fit of the actor and its products/services into a broader system) (cf. Bessant & Rush, 1995). The need for intermediaries and the gaps that spawned them have only increased in recent decades. A block of literature dedicated to business support starting from Caves (1977) raises the centrality of brokering, assistance and provision of purposeful services (i.e. business advice, consultancy) for small and medium enterprises for improved ability to deal with change, cost reductions and stimulation of competitiveness (cf. Bennett & Robson, 2000; Ramsden & Bennet, 2005; Boter & Lundström, 2005). Regional innovation systems studies also realize the need and crucial importance of business support services (Edquist et al, 2002; Asheim & Coenen, 2005; Inkinen & Suorsa, 2010). Meijerink (2005) underlines five causes that have facilitated the increase in number of hybrid organizational forms: erosion of authority (public organizations have lost much of their authority, or horizontal steering in networks), autonomization of executive agencies, re-introduction of market forces (governmental interference has been reduced), increasing speed of change (public authorities are pressured to act quickly), and lack of funding to develop the profit sector (cf. Dalziel, 2010).

Compared to the earlier view of intermediaries as agents of knowledge transfer and implementers in the service of businesses, intermediaries were beginning to be characterized as regional and even national entities – as value enhancers of widespread development and growth (cf. Wihlborg & Söderholm, 2013). This caused regional actors to reconsider their expectations of the intermediaries. Businesses' primary expectations of intermediaries today are assistance in widening networking channels and the provision of information and training (Bennett & Robson, 2000; Boter & Lundström, 2005; Ramsden & Bennett, 2005); on their own, businesses are seldom able to focus on collaboration but are forced to consider efficiencies of production and sales (Forsman & Solitander, 2003; cf. Barca et al, 2012; Chesbrough, 2013; Brown & Mason, 2014). Academics view intermediaries as the middle links of a chain that translates theories into practice and eases policy implementation in regional contexts. Public authorities view intermediaries as a way of improving regional development. All these actors know that the desired results will only be achieved if intermediary organizations are able to foster a collaborative context within the region (Rosenfeld, 2005; Ingstrup, 2010).

Industrial districts – as originally described in Marshall's work have had a positive influence on the development of intermediary organizations, whose mediating function was to provide firms with facilities, technology, and services acquired from other actors in the same or another sector. Later, Porter's diamond framework (Porter, 1998) drew attention to the presence of related industries supporting clusters, also a type of interme-

diating agent. The socioeconomic path and its representatives – emphasizing networks, learning, and the local specific – described the importance of drivers to start up and run exchange mechanisms.

In a current perspective, such a driver might have been an intermediary, if it targeted a specific gap like education, or a cluster initiative, if its focus was regions and clusters. Sölvell (2009) provides an insight into Porter's understanding of clusters, that intermediary organizations of various types play important roles. Recent research on clusters also tends to highlight intermediaries and networking, considering them important tools for creating links between heterogeneous actors (cf. Bergek & Norrman, 2008). Networks, cluster initiatives, and intermediaries are sometimes used as complements of each other, and sometimes even as synonyms, interchangeably (Rosenfeld, 2005; Smedlund, 2006; Eklinder-Frick, 2014). Together, these perspectives are responsible for the great strides made in explaining structural holes and regional differences (Malecki & Tootle, 1996; Burt, 2002; Rocha, 2013).

In summary the literature review above has shown that the phenomenon of clustering and regional collaboration has been observed for long time and many scholars have developed concepts to describe and understand it. The field has developed from being more grounded in economics studying the phenomenon from a higher analytical level whereas today the interest is to understand the dynamics of relationships, the roles of actors and performance. In future one aspect of interest could be an increased understanding of the relationships between policy, cluster initiatives and real needs of businesses.

Cluster initiatives in Sweden

This study is conducted in the Swedish context and the author finds it important to shortly introduce clusters and different forms of cluster initiatives in Sweden. The other reason for including this section is that Porter's study on the competitive advantage of nations included Sweden as a country actively facilitating cluster policy (Edquist et al, 2002; Hallencreutz & Lundequist, 2003; Inkinen & Suorsa, 2010). In addition, Porter and other famous researchers such as Etzkowitz were and are actively collaborating with Swedish government and academics. So, after abovementioned Porter's study, the Swedish Ministry of Industry initiated a survey to explore the possibilities of a more focused cluster policy. Although the cluster concept was considered just a new name for the partnership approach, as it was being called then, use of cluster began to spread in regional development practice. In the last decade, the cluster concept has been widely used in Swedish regions, and various agents support regional cluster-building processes as a better way of using local resources and becoming internationally competitive. On the national level, the Swedish Ministry of Industry, Employment and Communications supports the implementation and development of cluster policy.

Other business development agencies in Sweden are occupied with Regional Development Programs; for example, Tillväxtverket (Swedish Agency for Economic and Regional Growth) – who actively participates in the research and support of cluster initiatives in sectors such as biotechnology and woodworking; the Invest in Sweden Agency (ISA) –

which provides information and services for foreign investors in Sweden; and The Swedish Agency for Innovation Systems (VINNOVA) – which stimulates innovation and growth in Swedish regions. There also are entities concentrating on a special sector, like the media/music industry (Rock City, Småland), education and training for knowledge-intensive firms (SMIL, Östergötland), or the paper and pulp industry (Paper Province, Värmland). They often work in a format of shorter- or longer-lasting projects financed by municipalities and large businesses, and are known as positive supporters of clusters and regional development. This short description of Swedish initiatives is a good start for further broadening understanding of these entities and is seen as an input into illustration of their variations and specificity.

Broadening understanding of cluster initiatives

A cluster initiative – both an organization and a network

Cluster initiatives combine organizational and networking characteristics to varying degrees and can transform from the one to the other depending on the persons, specifics, and circumstances of their working environment. For example, a cluster initiative is a network when it organizes campaigns and provides services for cluster members. It is an organization when it files reports, particularly in the view of its sponsors, who use the reports to adjust their vision for the initiatives so that the initiatives keep step with the sponsors' overarching aims. As networks, initiatives are characterized by the presence of independent actors pulling together to carry out a task; by interactions between actors of varying natures; by mutual sharing and trust, or of the same community space or entrepreneur management; and by the involvement of public governance (Sorensen & Torfing, 2005; Eklinder-Frick, 2014; Emmoth et al, 2015; cf. Dirks & Ferrin, 2001). As organizations, cluster initiatives combine vertical and horizontal governance by entrepreneurs and sponsors so that the aims and objectives of the initiatives guide the path of development. Thus, as an organization, the initiative should be coordinated and is led by external parties, implicitly or explicitly; as a network, the initiative has a high degree of autonomy and self-regulation as well as limited or an absence of coordination.

Various streams of literature use their own terminology for cluster initiatives: for example, triple-helix literature calls these hybrids, comprising persons from three spheres; regional and innovation literature calls these intermediaries, acting as mediums for the exchange of information and messages between two or more parties (Van der Meulen et al, 2005; Howells, 2006; Leydesdorff & Zawdie, 2010; Katzy et al, 2013). The names may be different, but these entities still analogously characterize parts of a broader system that surrounds the cluster (Porter, 1998; Cooke, 2002; Asheim et al, 2006.), triple-helix cooperation (Etzkowitz & Leydesdorff, 2000), industrial districts (Dahmén, 1951; Maskell & Kebir, 2005), and learning regions (Florida, 1995; Morgan, 1997). These entities are vital to regions for their ability to organize activities and provide organizational support for the system's actors (Jacobs & De man, 1996; Giuliani & Bell, 2005; Keeble & Wilkinson, 2010).

Formation and organization of cluster initiatives

Cluster initiatives are often a result of entrepreneurial endeavors and idea-driven individuals and/or organizations (cf. Klofsten & Jones-Evans, 1996; Sundin & Tillmar, 2008). These people initiate cluster initiatives by acquiring various resources, signing up members, and designing intermediary activities (Aziz & Norhashim, 2008). Such individuals can be called the driving forces of initiatives; they are overflowing with the enthusiasm and energy to carry out activities and influence change. They create and expand initiative networks as well as create attractive offers for their members (Lundequist & Power, 2002; Emmoth et al, 2015). Sometimes the idea to establish an initiative is driven by other cluster members, sometimes by outside individuals or larger organizations, who remain and later join the core group; for example, policymakers may be interested in the information and communications technology (ICT) or biotechnology sectors in the area. Idea-driven actors in initiatives provide different kinds of resources than are usually available to clusters and which secure their survival and good functioning (Perry, 2007). Intermediary entities are often organized as time-limited projects and provide arenas for private and public actors to become involved. These actors, the driving forces, are autonomous and can become members, or not, as they wish (Blanco et al, 2009). They perform specific intermediary activities that answer to their main aim and objectives. Of the activities they organize, the central one is networking, followed by brokering, facilitating, and providing meeting places (Feser, 1998; Ahedo, 2004; Howells, 2006; Moss et al, 2009; Turner et al, 2013; Katzy et al, 2013).

Necessary attributes of cluster initiatives

The main objective of cluster initiatives is to create a niche, explore unfulfilled needs, while also advancing, their original program. This program allows initiatives to fulfill member needs while they pursue their own aims and build legitimacy in their surroundings. The more signs of longevity that appear, the more opportunities initiatives will have to reinforce their legitimacy and further develop their identity (March & Olsen, 1995; Sorensen & Torfing, 2005; cf. Kock et al, 2012). Apart from a clear program, another feature that helps initiatives become successful is the development of sufficient capability to adequately respond to external changes, overcome economic challenges, and adapt programs and contents (Jessop, 2003; cf. Kiese & Hundt, 2014). To remain competitive and in demand, cluster initiatives must upgrade previous capabilities and develop new ones, adapting and recombining existing practices to local conditions (Clarke, 2001, cf. Barca et al, 2012).

In a micro perspective, some organizational studies define large membership and level of member activity in cluster initiative operations as one central success factor and access to financial and other resources (Howells, 2006; Davidsson et al, 2010; Klofsten, 2010). A continuous inflow of new members helps initiatives meet financial challenges and is a sign of well functioning, stimulating staff to continue working with the same objectives. Well-functioning is usually also a prerequisite for acquiring and renewing financial support. Entrepreneurship literature in general downplays this and mainly discusses the entrepreneur, clarity of idea, and personnel commitment as key success factors for cluster initiatives (Klofsten & Jones-Evans, 1996; Normann, 1975; Ketels & Memedovic, 2008).

However, the literature raises weaknesses in cluster initiatives' policy and management, which are discussed in detail in the following section.

The other side of cluster initiatives

Sometimes referred to as a political lock-in, one critical limitation on the other side of cluster initiatives is linked with policy mechanisms (Grabher, 1993; Malmberg & Maskell, 2002; Martin & Sunley 2003, 2011). General mechanisms (i.e., subsidies, supporting organizations, maintenance of support institution lifetime) ineffectively ensure cluster initiative success because the one-size-fits-all model is inadequate. Some programs, however, provide more effective support than others, although the question is, which have the potential to be most effective, and in what context (Feser, 2008; Burfitt & MacNeill, 2008). For this reason, policy development is sometimes described as a “muddling through” or a trial-and-error process producing poor understanding, minor contributions, and incremental succession (Enright, 2003). Cluster policy focuses on creating clusters and increasing their size, but policy contributions are often limited to facilitating internationalization of local entities and upgrading their competitiveness (Duranton, 2011; Ketels, 2013b). There are calls to improve policy leverage via strategic dialogs with various actors/stakeholders (Lundequist & Power, 2002; Feldman & Francis, 2004; Ebbekink & Legendijk, 2013), a bottom-up approach to policy design (Nauwelaers, 2001; Ahedo, 2004; Kiese & Wrobel, 2011), and embedded performance-measured formats (Aziz & Norhashim, 2008). However, endeavors to implement these calls “are not crowned with success” (Hassink, 2005; 2010; Martin & Sunley, 2011; Kiese & Hundt, 2014).

Another block of limitations inhabiting the other side of initiatives can be portrayed as a functional lock-in or low relational thickness – expressions used to describe the collaboration approach of cluster initiatives (cf. Grabher, 1993; Martin & Sunley, 2006; Vicente, 2014). One often-discussed problem is the overdependence of clusters on key actors, who play the roles of collaborators and governors simultaneously (Tödtling & Trippel, 2006; Klerxs & Leeuwis, 2008). Relying exclusively on a small group of influential players and ignoring recruitment of new partners often results in resource and management overdependence on these players, limits maneuverability and access to research ideas, and freezes geographic scope and willingness to explore new markets (Zucker et al, 1998; Bathelt et al, 2004; Saxenian, 2006). This can also cause some stakeholders to drop out, those who enrich the facilitating and organizing capacity of cluster initiatives.

A third block of limitations primarily concerns the aims of cluster initiatives; their highly specialized focus can be disadvantageous for firm performance due to large resource expenditure and collective lock-in to established ways of doing things (Martin & Sunley, 2011). As in the previous block, this can become a reason for stakeholders to leave the initiative, taking their support with them. The other obstacle here is the inadequacy of performance measurements of initiative impact and firm achievement; measurements remain subjective or, at best, a matter of broad, generalized instruments. This can be worsened by the adaptive culture of modern firms and cluster initiatives where much is

affected by changes within involved parties and external shocks (Martin & Sunley, 2011; Kiese & Hundt, 2014).

These aspects of the other side of cluster initiatives should be looked upon as a fruitful platform for both researchers and policy makers requiring improvements. I also think that the illustration of these limitations provides more comprehensive picture of the initiatives, which are, as any other organization, a combination of positive and negative instances.

Definitions and interrelationships between key concepts

This dissertation deals with three key concepts: cluster, cluster initiative and intermediary organization. The first, *clusters* can be viewed as the forerunners of cluster initiatives, and the two have several related features. Cluster is defined as “geographically proximate groups of inter-connected companies and institutions in a particular field linked by commonalities and complementarities” (Porter, 1998, p. 78). They comprise geographical agglomerations and inter-firm and inter-organizational networks. Clusters encompass actors from linked industries, mostly within the region, but also internationally (Etzkowitz, 2003).

The second is the *cluster initiatives*, which are entities emanating and inspiring surrounding actors for joint activities and collaborations (Sölvell et al, 2003; cf. Nordensky, 2009). Furthermore, they are entrepreneurial organizations with an intermediary role, which carry the triple mission of revitalizing businesses, regions (and cluster) and secure their own well-being (Sölvell, 2009; Ketels et al, 2006). The previous discussion in this chapter have introduced and described in depth cluster initiatives and will therefore not be discussed further here.

And lastly, the third, this work considers also the concept of an *intermediary organization* to be a defining feature of cluster initiatives, which carry out various intermediary roles on behalf of their members. These roles include brokers, facilitators, and promoters (cf. Smedlund, 2006; cf. Högberg, 2011). An intermediary organization is defined by its structural position: one of mediation in the relationship(s) of two or more actors such as institutions or organizations (Van der Meulen et al, 2005; Stewart & Hyysalo, 2008). Howells (2006) characterizes intermediaries as organizations that act as brokers in the innovation process between two or more parties by providing services, including provision of information about potential collaborators; as mediators between already collaborating actors; and as monitors, funders and supporters by other means of their network members. According to den Hertog (2000), an intermediary can assume the role either of a source of innovation (i.e., initiating innovations and leading development of existing products/processes) or of a carrier of innovation (i.e., transferring an innovation to make use of it by other actors).

These three concepts should be considered in combination due to their close interrelationships and great joint input into entrepreneurship and regional development. In particular, entrepreneurship tends to be more intensive in clusters with active operations of cluster initiatives and intermediary organizations due to the reliance on

tightly linked partners, on spreading costs of potential failures, and the possibility of taking advantage of various job opportunities (Ketels, 2004; Bienkowska, 2007; Ketels & Memedovic, 2008; Wennberg & Lindqvist, 2008; cf. Kock et al, 2012). Moreover, mobile ideas and information and easily accessible resources – facilitated by an interactive environment and knowledge spillovers – make it easier to identify opportunities for creating and commercializing innovations (Buenstorf & Fornahl, 2009, Lundmark, 2010). Furthermore, these key concepts are known, not only as contributors, but also as explanatory factors of differences that occur across various regions (Porter, 1990; Saxenian, 1994; Reynolds et al, 1994; Malecki, 1997; Feldman, 2001; Swords, 2013; Ketels, 2013a) due to their joint capability to facilitate interactions, inflows of new knowledge as well as to enable and exploit the supportive infrastructure (Feldman & Audretsch, 1999, Frenken et al, 2007; Inkinen & Suorsa, 2010; Wihlborg & Söderholm, 2013).

At the same time, it can also be the other way around: entrepreneurship can be a seed, rather than the consequence, for cluster building and creation of cluster initiatives and intermediaries (Rocha, 2013). In particular, relying on own knowledge, experience of the needs and demands and creative practice (Shane & Venkataraman, 2000; Shane, 2000; Borch et al, 2008), individuals are able to mediate between the actors by, for example, setting up a cluster initiative. Such cluster initiative inspires various venturing attempts by other individuals (cf. Schumpeter, 1936). Therefore, entrepreneurs are seen as sources of development and growth as well as brokers creating connections and bridging ‘structural holes’ between actors (Schumpeter, 1936; Audretsch & Thurik, 2000; Burt, 2002). This discussion highlights that this dissertation embraces broad view of entrepreneurship, which follows Gartner’s (1988) view of entrepreneurship as a process (cf. Landström, 2007) of creating new organizations – in this case cluster initiatives. The entrepreneurial process in forming such new organizations is about taking advantage of upcoming opportunities (cf. Shane & Venkataraman, 2000) in the entrepreneurial network and developing them to sustainable activities that are linked to the real needs of the potential participants in those activities.

3. METHODOLOGY

This chapter begins by describing my research approach and path to a research focus. Both affected choice of philosophical approach. The research process, including the modes of collecting empirical material and the outcomes of scientific articles and papers is then discussed. Each paper's aim, major research results, development process (history), and authors' contributions are laid out. Special attention is dedicated to generalizations and methodological limitations as well as to questions of confidence concerning the findings and of validity and reliability.

Research approach and reasons for the line of study

Study of a subject can be a matter of personal interest, of a work assignment, or both. Personal interest may stem from something the person enjoys doing, the person is good at doing, or which would benefit the person's future (Plous, 1993). The most profound knowledge of a subject is captured when personal interest is awakened by positive or negative facts, which the individual supports or rejects. Doctoral studies undertaken as a work task assigned by an employer and not based on personal interest are less rewarding personally.

This dissertation was written out of personal interest and passion. During Master level studies (Jönköping International Business School, Sweden), the study of cluster initiatives became a way to exercise interest in collaboration and entrepreneurship. The roots of this interest stem from frequent contacts with the local science park in Jönköping. During the seminars I attended, participants' ambition for joint achievement in their striving to reach municipal and regional goals, which I witnessed, inspired me. I was curious to know more about their work and understand the functional mechanisms, especially when I discovered that the employees were unable to fully explain their organization, the financiers, and why they were being financed. Theoretically, cluster initiatives have the reputation of being entrepreneurial organizations with a collaborative focus for the purpose of revitalizing regions and businesses (Sölvell, 2009; Ketels et al, 2006). These primary characteristics made me curious about their work processes and societal function; their remarkable position as a go-between among other actors, unexpectedly flat and flexible structure, emphasis on member needs, multifaceted activities, and ability to attract various competencies were other features that woke my interest in cluster initiatives. It was hard to believe that a single cluster initiative could do and be all this.

The picture thus drawn was that cluster initiatives were facilitators capable of rescuing stagnating businesses and regions. At the same time, this impression of cluster initiatives seemed exaggerated; my life view postulates that everything has a dark side; nothing is all one or the other. Literature has mentioned some drawbacks of these organizations: short-term existence, nearly immeasurable outcomes of learning and exchanges, over dependency on the primary financiers, and reliance on the entrepreneurial skills and competencies of the core team (Brown, 2000; Perry, 2007; Aziz & Norhashim, 2008; Tuula, 2008; cf. Kiese & Hundt, 2014).

Endeavors to create a comprehensive picture of cluster initiative operations that hosted all features, positive and negative, were elusive: knowledge sources failed to illustrate clearly the functioning of initiatives, and other information was lacking. The question, How did cluster initiatives come about? was a sign that unknown elements were restricting an understanding of the initiatives' organization and work processes in theory, and potentially in practice. If practitioners manage the unknown by trial-and-error methods and following their hunches, theory remains a question mark. So my personal interest, motivated by existing limitations and sustained by the desire for knowledge and understanding, became the driving force of this dissertation and a career development path. The support of Professor Magnus Klofsten, my supervisor, in forming a relevant topic for this research, as well as encouraging me to combine several methods in the research design, have had a great impact on the results of this work, which will hopefully reduce errors in practice and support the entrepreneur's hunches by building an analytical basis for action.

I began my doctoral studies in 2010 and was employed by the Helix Centre of Excellence, a research centre in Linköping, Sweden that works to link researchers, businesses, and other institutions. It was a good place for deciding the focus of my studies and observing the real-life working of the entrepreneur's world. Soon after I began at the Centre, I authored in collaboration with a colleague there "In the middle of everywhere – intermediary organizations and entrepreneurship", a working paper (Hallström & Laur, 2010). I presented this paper at the European Group for Organizational Studies (EGOS) conference in Gothenburg (June, 2011), and the work generated much attention from various researchers. The paper became the basis for a research proposal, which led to this dissertation. In the proposal, cluster initiatives – at that time referred to as cluster-like organizations – were proposed as the point of investigation; cluster initiatives were in their embryonic form compared with clusters and intermediary organizations. Under the influence of Sölvell et al (2003), these cluster-like organizations were renamed cluster initiatives. My first literature search on cluster initiatives in 2011 yielded over 300 articles during the previous three years alone. Moreover, the cluster profile database managed by the Institute for Strategy and Competitiveness at Harvard Business School in the US contained profiles of more than 800 initiatives in 52 countries. Numerous organizations, including the Organization for Economic Co-operation and Development (OECD), the European Commission, the U.S. National Governors Association, and the United States Agency for International Development (USAID), have devoted major conferences and policy initiatives to this topic in recent years (Ketels, 2003; Lindqvist et al, 2013). These examples illustrate some of the huge interest that this topic generates among researchers and practitioners.

The path to research focus

Together with personal interest, greater awareness of entrepreneurship and its societal benefits guided my choice of research focus. By implementing novel approaches that reduce costs and raise the quality of previously delivered services and products, entrepreneurs contribute greatly to employment growth and the economy of their local regions (Malecki, 1997; Benneworth, 2004; Barca et al, 2012). Thus, entrepreneurship and

its contribution to regional development were the starting point in developing a topic for this doctoral dissertation.

Relevant studies on entrepreneurship and its link to regional development often focused on clusters. Concerning clusters and entrepreneurship, the view was that clusters facilitated entrepreneurial activities, or vice versa (Rocha & Sternberg, 2005; Delgado et al, 2010). A cluster's own well-being and its impact on entrepreneurship rest on the willingness and efforts of local companies to network and collaborate. The vision introduced by businesses at the beginning of this century placed the major focus on production efficiency, to the detriment of entrepreneurial initiatives from employees to widen companies' networks (Forsman & Solitander, 2003; Brown & Mason, 2014). Such a change could have isolated business units from each other and reduced a cluster's impact on regional development. However, specific organizations – cluster initiatives – began to fulfill the function of network builder, which intermediated gaps not previously addressed (Burt, 2002). My personal view of these organizations at that point was that they were the unspoken heroes behind the successful development of businesses, clusters, and regions. Cluster initiatives are bodies comprising entrepreneurial spirit and individuals; they fill gaps and are the glue that brings actors together and promotes collaboration (play an intermediary role); they strive to improve the status quo.

Philosophical stance

Slife & Williams (1995) state that authors' philosophical views are seldom explicitly expressed in research despite widespread recognition of their influence on research design, and thus, results. Consequently, they recommend that the main philosophical views (i.e. beliefs that lead to action) underlying any piece of research work be discussed because the views explain choice of methodological approach, data type, researcher role, and outcome: this can be called shaped knowledge (Guba, 1990). Occasionally, the discipline, advisors, or personal experience shape these beliefs. In this thesis, the underlying philosophical stance springs from neither my advisor nor the university faculty, but from my personal life vision and the newness of the topic. This thesis is neither theory nor method driven; it is phenomena driven. My aim is to enrich the understanding of phenomena – their interconnections and impact. Phenomenon-based research is in place when there is no or very limited literature investigating the area of the interest and no superior research designs as exemplified in the area of cluster initiatives. This is a strategy that explores broadly the life occasion that can be accounted as phenomenon (von Krogh et al, 2012). The whole attention is placed in this phenomenon and its relationships with the other ones in particular clusters and intermediary organizations.

These interrelated phenomena – cluster, cluster initiatives, and intermediaries – represent a mechanism with its own operational procedures and outcomes. To understand the working of this mechanism – how it solves problems and thus, how it secures the delivery of desired outcomes – is the objective of this work. Pragmatists raise similar concerns in their philosophy (Patton, 1990), which propounds the need for choice and for freedom from critical or restrictive assumptions. Such a stance facilitates an unbiased understanding of a rather new phenomenon like the cluster initiative, and the formation of hypotheses to

identify the normative standards that govern it (Dewey, 1941). This stance yields combined knowledge, which aids the planning and creation of actions (Peirce, 1960; Dewey, 1941). Thus, pragmatism is one of the underlying worldviews in this research.

Driven by pragmatic views, this study applied pluralistic methodology to increase understanding of the research problem. This is not without precedence. In their efforts to define what and how, pragmatic researchers use action, situation, consequence, or a combination of these, as a starting point (Cherryholmes, 1992; Morgan 2007). In its focus on the cluster initiative phenomenon, this study respects a major concern of pragmatic philosophy: to consider the context – social, political, and historical – in which initiatives originate and operate. It is one way to discover truth (cf. Rossman & Wilson, 1985). But it most likely is a temporary truth: human action brings change, altering the basis for acquiring knowledge. In simple terms, the results of the research were true at the time of observation, and according to pragmatists, might not be as relevant in the future (George & Bennett, 2005). Pragmatists, who anticipate all possible outcomes, do not view this as a problem; but the need to revisit previous generalizations still exists, if only to verify that they have not changed (Patton, 1990).

The pragmatic view, however, is not concerned about collaboration in building understanding and creating knowledge, something that is central to this study and a mainstay of participatory philosophy (Wright et al, 2010). Combining a pragmatic stance with a participatory view to create synergies reflects the nature of this research and was influential in the qualitative as well as the quantitative studies in this thesis. Write et al. (2010) state that a participatory worldview can be applied to various degrees in other philosophies, including the pragmatic. Huffman (2013) raised the same line of thought, stating that participatory and pragmatic views enhance each other when used in combination.

The reliance on the both schools underlines the importance of knowledge creation using multiple approaches and considering surrounded circumstances (pragmatic stance) in collaboration with a respondent, which goes beyond research on or about the respondent (participatory stance). To be more precise, the two core elements of participatory research are found to be crucial in my research approach are quality of interaction between research leaders and participants and withholding the connection between research and social action (Write et al, 2010). The former contains the joint design of research questions, data collection and analysis, and sharing of research rewards while the former calls for researcher not to become a native with the respondents, but independently and realistically observe life occasions. Moreover, the central elements of pragmatic stance was the consideration of diverse social, political, historical agendas and reforms while preparing a foundation for research as well as use of diverse approaches to discover the reality.

Social science research methods: qualitative vs quantitative approaches

This thesis is built on mixed methodologies, incorporating elements of both quantitative and qualitative research (Mertens, 1998). Newman & Benz (1998) consider multi-methods approaches as “residing in the middle of a continuum”, because although they view

qualitative and quantitative methods as different ends of a spectrum; they do not consider them to be polar opposites (Creswell, 2009, p. 3, cf. George & Bennett, 2005). Tandem methodology is recognized as being of greater strength than either method by itself (Creswell & Plano Clark, 2007). It helps neutralize the bias that can occur when using a single method (Jick, 1979). Theoretically, these methods can be applied together, at the same time, or the results of one methodology can serve as grounds for improving questions before applying the second methodology (Sieber, 1973; Tashakkori & Teddlie, 1998). The methodological design of this dissertation applied these methods in sequence, not together (Table 2).

Table 2: Papers and methodological approach.

Paper and aim	Methodological approach
1: To investigate activities organized by cluster initiatives and to create a typology of the involved actors.	<i>Qualitative:</i> In-depth case study approach of four cluster initiatives through interviews and documents. Interactive research approach.
2: To enrich insights into cluster initiatives as intermediaries concerning their general characteristics, involved actors, and organized activities.	<i>Quantitative:</i> Questionnaire survey of 136 cluster initiatives in eight European countries.
3: To investigate how cluster initiatives intermediate within a triple helix context in terms of actors' involvement and dependency patterns between their maturity and member enrolment.	<i>Quantitative:</i> Questionnaire survey of 136 cluster initiatives in eight European countries
4: To map central qualitative success factors at the cluster initiative level.	<i>Qualitative:</i> In-depth case study approach of five cluster initiatives through interviews and documents. Interactive research approach, in part.
5: To address limitations in current cluster initiative policies and generate recommendations for refining existing instruments at the regional level using a bottom-up perspective.	<i>Qualitative and quantitative:</i> Synthesization of case study and survey results to build a platform for a conceptual paper.
Paper 1: Catching Regional Development Dreams: A Study of Cluster Initiatives as Intermediaries.	
Paper 2: Understanding Cluster Initiatives in Europe: Uniqueness and Contextuality.	
Paper 3: Cluster Initiatives within the European Context: Intermediary Actors and Development Process.	
Paper 4: Success Factors in Cluster Initiative Management: Mapping out the 'Big Five.'	
Paper 5: Cluster Initiatives within the European Context: Stimulating Policies for Regional Development Dreams.	

Interest in qualitative research grew during the last century because it tends to handle complex realities in social science better than when only a quantitative approach is used (Gubrium & Holstein, 1997; Creswell, 2008). Brannen (2005) states that qualitative studies focus on meaning and on describing the complexity of a situation while quantitative studies focus on actual behavior. Qualitative studies are more flexible: different methods of data collection may be used in the same study; in quantitative studies, it is best to use one particular method (Chetty, 1996; Patton, 2002). The growing popularity of qualitative designs does not make the quantitative irrelevant; rather, the qualitative is more advanced in its use of increasingly complex main and control variables to generate multiple explanations of life episodes. In contrast to qualitative methodologies, the value of the quantitative is its ability to capture large samples as well as be carried out by different researchers without undue influence of their subjective views (Silverman, 2001). Thus,

these studies are able to score highly on reliability tests while in qualitative studies; reliability is problematic due to researchers' subjective views and categorizations (ibid). Despite the differences and specifics of these methodologies, the goals of both are to generate theories and implications, and test these on empirical material.

Building primary understanding of the topic

Choice of study topic and methodology should always contribute to development of the field, that is, strive to widen or deepen the existing knowledge base (Eisenhardt & Graebner, 2007). So it is important that the study design include a review of the literature (Cooper, 1984; Creswell, 2008). The research topic must first of all be relevant and the aim limited in scope. The research should then fill in knowledge gaps; extend other findings or both. For papers in progress, the extended literature review can add to the discussion by suggesting previously considered aspects. The review can also raise the idea of replicating a study using new actors and situations (Marshall & Rossman, 2006; Creswell, 2009).

All projects in this dissertation began with a literature review. The purpose was to assess previous research, including empirical cases when possible, to form an understanding of the topic. Linköping University search databases, World Wide Web sources, and search engines such as Google Scholar were used. The searches used various key words and combinations of key words such as cluster initiative, cluster initiative and intermediaries, and cluster and cluster initiative. Literature sources suggested by other doctoral students, academics, and practitioners were also considered and screened. The reviews took place during idea generation in the five projects comprising the five appended papers. Often, such suggestions were extracted from personal meetings but some came from workshops and presentations at special events such as HELIX-day (HELIX VINN Excellence Centre, Linköping University), Assembly - Vimmerby cluster, and the Round table seminars in Bodö, Norway. The literature review helped decide choice of method, such as qualitative for Study 1, and quantitative for Studies 2 and 3.

Qualitative approach – interactive approach

Study 1 is based on qualitative methodology and uses case studies as instruments. A case is a description of a phenomenon in a life setting (Yin, 2009). When this thesis was begun, primary understanding of cluster initiatives was limited and just positive aspects of these organizations were primarily depicted in the literature. Thus, a qualitative methodology was considered most appropriate at the beginning, but also later on (cf. Morse, 1991) (Table 2). The aim was to define their diversified and complex organizational features, actors, and working tasks. In Study 4, qualitative methodology was also considered a good tool for mapping cluster initiative stakeholders, demarcating their tasks, and defining appropriate assessment criteria. These criteria were unpredictable, and extracting the relevant from the irrelevant, due to the numerous theories on firms and to firm-cluster initiative differences, was no easy task.

Miles & Huberman (1994) claim that aims, research questions, and units of analysis must be clearly defined to produce a proper qualitative study. This was done in the two

qualitative studies here after an extensive literature review. Bennett & George (1997) consider a pre-understanding of the cases important for enhancing research design. An introductory review of each case was done to build a basis for formulating the right questions for the respondents and to deepen understanding of other aspects than are accessible on websites and in documents. Furthermore, the items were open response so that interview respondents could exemplify actors, tasks, and key performance indicators (cf. Patton, 2002). In qualitative methodology, the open response format is an important tool for capturing a rich picture of events (cf. Krag Jacobsen, 1993).

As mentioned earlier, cluster initiatives are flexible bodies applying adaptive behavior; their working tasks and actor constellations are changeable, and few of their routines have been formalized. For this reason, quantitative methods in the explorative phase would be less suitable than qualitative; unless periodically repeated, quantitative methods are unable to capture small changes occurring over time (Creswell, 2008). This is the other argument supporting use of qualitative methodology and a case study method.

The important specific of this study is its collaborative research approach. Known as interactive research, it assumes joint learning between researchers and participants, to jointly create new knowledge (Ellström et al, 1999; Aagard Nielsen & Svensson, 2006). This is the predominant approach in case studies and experimental methods, but it can also be applied in surveys. For example, in action research, also in participatory approach, an interactive setting strives to minimize such limitations, initiate provision of new information and feedback, and encourage a dialog with participants. The interactive research approach has a threefold task: to contribute to practical and theoretical concerns (e.g. handling practices and management changes), to create acceptable knowledge (e.g. new concepts, theories, and models), and to enhance the competencies of participants (e.g. through dialog, learning, and the reaching of a common understanding of the situation) (Brulin et al, 2003). The interactive approach, comparing with traditional setting, was found to be superior due to its capacity to affect development of practical and theoretical aspects, thus ensuring the critical voice of participants and a long-term perspective on knowledge production (Svensson et al, 2002). At the same time, the interactive approach has several drawbacks: it is resource demanding, it is time consuming, and the researcher risks becoming a participant (Ellström et al, 1999).

The choice of qualitative methodology was viewed as a preparatory study for defining different variables as well as developing an understanding of the interrelations between various organizational processes and their influence on the outcomes delivered by the cluster initiatives. It also aimed to observe the possibility to apply other theories to the cluster initiative phenomenon as in Study 4.

Quantitative approach – statistical considerations

Studies 2 and 3 are based on quantitative methodology and use a survey questionnaire as the instrument. The quantitative approach views theory as something that helps to predict and explain real-world phenomena (Kerlinger, 1979). Study 2 strives to define general characteristics and operational patterns of cluster initiatives, while Study 3 aims to define

patterns of intermediation and dependency between maturation and memberships. Quantitative methodology is often used to identify common patterns and explore the routines of immature topics (Morse, 1991) (Table 2). The results of Studies 2 and 3 draw a general picture of cluster initiatives that can be used in future to build more precise theories and predict the functioning mechanism of similar entities.

To perform a quantitative study properly, Field (2009) states that the aims and hypotheses should be clearly defined. Existing research in the field can be used to enhance research design and results (Creswell, 2009). Studies 2 and 3 addressed these recommendations in the following way: first, a preliminary literature review informed the survey questions and served as a basis for hypotheses on how variables relate to one another; second, a primary understanding of cluster initiatives was derived from previous projects and used in methodology selection, in hypothesis formulation for the survey, and in variable choice for the analysis; and third, operations in similar organizations were familiar before the start of survey preparations.

One of the main limitations of quantitative methodology is its difficulty in capturing anticipated information. Some scholars say that this can be circumvented by using open questions while others claim that open questions lengthen interview time and decrease willingness to participate in the research (Groves, 1990; Patton, 2002). The survey in Studies 2 and 3 comprised structured, open- and closed-ended questions. The open-ended questions yielded more information and allowed for a deeper understanding of the processes occurring in cluster initiatives and of their participants. No interviewee was unwilling to participate after being informed of the approximate time needed for answering the questionnaire. Moreover, most interviews were made over the phone; thus, the survey questions could be explained when needed, and anticipated information and other signs (e.g. tone of the voice and manner of expression) could be captured. This form of data collection is often found in the literature to be superior to other forms and to be helpful in dealing with the limitations of quantitative methodology. The descriptions of each study below discuss methodological choice in more detail.

Studies 1 and 4

Qualitative approach – data collection, databases, and analysis of the empirical material

The empirical databases in Studies 1 and 4, the two studies in this thesis based on a qualitative approach, were collected at different times (2011 and 2009, respectively) from different samples. Both studies, however, used similar and quite broad sample criteria, such as operations in various sectors, presence of leaders, and length of operations. Rather than being a limitation, the variety in type of cluster initiative allowed differing investigation aims and broad research questions to be formulated. Both studies contributed to the development of different aspects of knowledge.

Based on the sample criteria, Study 1 selected 15 cases that together would represent an overview of their actors' constellation. The cluster initiatives were found using Google on the World Wide Web. After primary contact, four initiatives were willing to cooperate (a condition of the interactive research approach) and these participated in the study. These

four cases show a variation of cluster initiatives and are relevant and valuable examples. Data comprised 10 in-depth interviews together with examinations of operational manuals (e.g. notes, track records, agendas), evaluation reports, and other documents describing the cluster initiatives' activities. Key individuals who had been involved with these initiatives for a substantial time were identified and interviewed by telephone (Heckathorn, 1997). Each interview took approximately 90 minutes and comprised 16 open-ended questions on cluster initiatives, the stakeholders and their roles, and the activities and development of the cluster initiative over time.

The database in Study 4 comprised 5 cluster initiatives that were selected from a primary sample of 11 initiatives based on willingness to participate in the research. The key focus of Study 4 was to assess the relevance of the success factors derived from the business platform model (Klofsten, 1992). As in Study 1, Study 4 was built on semi-structured in-depth telephone interviews with cluster leaders and managers. Eight interviews of approximately 90 minutes each were conducted. Information extracted from other written documentation (e.g. brochures, internal written material) and the cluster initiatives' web sites was also recorded in the database.

In both studies, respondents received the main interview questions and definitions in advance, so they could familiarize themselves with the aim of the investigation and retrieve information before the interview (Bennett & George, 1997). Before the interview, Study 4 respondents also received descriptions of the success factors along with questions on validating these factors and on possible operationalization methods of the factors.

After the interviews, the analysis process began. Study purpose and research question guided the three stages of each analysis: formulation of preliminary results and points of analysis, control and completion of these by the interview respondents, and final sharpening and clarification by a joint research group. Interview transcripts and relevant blocks of literature informed the first step and helped frame the analysis and discussion. The points of analysis focused on single cluster initiatives or were cross-analytical in nature, striving to relate, or contradict a relation between, the initiatives. This technique is well suited for generating common patterns of operations and, compared with analyses of single cases, for hypothesizing generalizations (Glaser & Strauss, 1967; Patton, 2002). The second step aimed to ensure the correctness and completeness of the summarized information and searched for new analytical thoughts that the researchers might have overlooked but were still relevant for practitioners. The last step generated an actors' model (Study 1) and confirmed the proposed model (Study 4) as well as improved the central findings and conclusions of each study, and of the entire project.

Studies 2 and 3

Quantitative approach – data collection, databases, and analysis of the empirical material

A primary sample of 253 registered cluster initiatives in eight European countries (Germany, Netherlands, Belgium, Finland, Norway, Sweden, Denmark, and the United Kingdom) were selected for Studies 2 and 3. The initiatives were identified through sources such as Europa InterCluster (intercluster.eu) and TCI Network databases (The

Competitiveness Institute, tci-network.org). Additional initiatives found through Google widened and diversified this first sample. The choice of these eight European countries was supported by results, for example, of Broekholt & Thuriaux (1998), Roelandt & den Hertog (1999), Rouvinen & Yla-Anttila (1999), and Archibugi et al. (2009), which found that these countries eagerly support and promote cluster policies. Five selection criteria guided the search for primary sample cluster initiatives: (1) clearly stated aims and objectives, (2) presence of leadership, (3) established relationships with stakeholders, (4) a portfolio of activities, and (5) a minimum operating life of six months. One of the first tasks in each interview was to confirm that the participating initiative was, in fact, an actual cluster initiative by verifying the sample selection criteria with the respondent (cf. Jick, 1979; Creswell & Miller, 2000).

The leaders and managers of the sampled cluster initiatives were asked to respond to 39 survey questions over the telephone, which covered themes like general characteristics, actors, activities, tasks, and resources. The propositions and hypotheses forming the basis of the survey derive from findings generated in qualitative studies and nine case studies (Paper 1 and 4). Two rounds of pilot testing were done with representatives from five Swedish cluster initiatives who gave feedback on the comprehensibility of the questions. This helped ensure that the survey questions were correctly understood and relevant for practitioners. As another result of the feedback, the interviewer, before the survey began and in conversation with the respondent, clarified definitions and confirmed that the respondent's initiative met the study's selection criteria. The multiple checks of questions by the project research team and three external researchers, working in the same field of knowledge, addressed their theoretical relevance. It was decided to conduct the interviews over the telephone to increase not only the reliability and validity of the responses but also the response rate; direct dialogue with the respondent makes it possible to clarify misunderstandings (Hair et al. 2009). No language difficulties were observed, even among respondents in non-English-speaking European countries. To further ensure the correctness and richness of answers, the research design included the use of secondary sources and follow-up interviews (cf. Hair et al, 2009; Field, 2009).

About half of the cluster initiatives in the primary sample, 136 (53%), were reached for the telephone interview; others preferred to use the online form (only five respondents answered using on-line form). Four researchers and assistants conducted the telephone interviews simultaneously. Each interview response was quality checked; if needed, the response was supplemented in a follow-up interview, or via home pages and operational manuals, and then submitted to the Webropol online platform. The overall time to complete the survey was estimated at around 40 to 60 minutes. Responses were codified and then analyzed using descriptive statistics, frequency tables, illustration graphs, and multiple linear regression models in SPSS. Other analytical techniques were also considered, to test preliminary relationships between about 200 variables (e.g. factor analysis, sequential regression, and correlation matrix), but judged less appropriate. Instead, variance inflation factor (VIF), tolerance, significance levels, correlation of determination (goodness-of-fit) and explanatory power were used to detect violations of statistical assumptions. Trochim (2006) states that these methods are known for their

ability to capture large amounts of data in a sensible way, which helps to visualize general patterns. The results of the statistical analyses became a basis for Studies 2 and 3.

Study 5

Combining results to improve policy input

Study 5 (Table 2) is based on the results of Studies 1–4 and addresses limitations in existing public policy by recommending improvements. These recommendations were suggested by practitioners participating in the research or were extracted by the researcher from their implicit expression by the practitioner. The theoretical evidence collected over the last four years (2010–2014) was extracted from approximately 500 scientific articles and reports in the fields of management, networking, and organization and 100 operation manuals and reports. Around 140 European cluster initiatives participated in this project, and more than 200 hours of conversations with leaders and managers were recorded. All these materials were synthesized to provide policy recommendations for fostering improvements in cluster initiative programs.

Tashakkori & Teddlie (2003) and Bryman (2006) support this choice of methodology and state that combining the results of various methodological approaches is most effective when used in studies aiming to explain, better understand, and thus improve. Creswell (2009) defines sequential mixed methodology – the methodology of Study 5 – as use of quantitative instruments to expand the results of qualitative methodology. So, this thesis begins with multiple case studies (qualitative), which are refined by a survey questionnaire (quantitative). The strategy of this thesis was to summarize all empirical results in a final conceptual paper.

Papers' history and division of work

The underlying purpose of the papers in this doctoral dissertation was to gain as much knowledge and experience as possible on designing and publishing papers in scientific journals. Professor Magnus Klofsten, my main supervisor, eagerly supported me, and giving me not only freedom but also support when I was unable to find my way. Thus, on three papers I am the first author, which means that I was the major contributor to the initiation, design, and writing of the studies. In Study 4, main supervisor and Assistant Professor, Dżamila Bienkowska, my co-supervisor, initiated and led the project; my role was less central. I wrote the last paper (Study 5) on my own to test my ability to express myself and steer the research process.

Study 1

For Paper 1, I proposed the topic and received great support from my supervisor Magnus. Choice of relevant cases and collection of empirical data were my first real research assignment as a doctoral student. These were undertaken between autumn 2010 and spring 2011. He assisted me at this stage in choosing the most relevant, but less complicated, cases for this first study. Dżamila Bienkowska made major contributions in structuring the analysis and discussion chapter of the paper and also helped graphically illustrate our

results. I presented Paper 1 at the International High Technology Small Firms Conference, 9-10 June 2011, in Manchester (UK). After revision, the paper was sent to *European Planning studies*, and after one round of reviews, was published in 2012.

Study 2

The idea for Paper 2 came in 2012, and a long process of data collection concluded in a first draft in June 2013. I then presented the paper that June at the International HELIX Conference in Linköping (Sweden). Magnus Klofsten proposed combining different methods in this study, and I fully supported this idea, realizing its added value to the overall results and recommendations that would stem from the thesis. I took several steps to master basic statistics, which was unfamiliar to me at that time. This knowledge helped in designing a survey and procedures that would improve the confidence of the results. The main supervisor was actively involved in the design and questionnaire test process. I collected data with the help of three Master's students and wrote the paper. After the HELIX conference, the organizers invited me to publish my conference paper in an upcoming book. During the conference, I met Alain Fayolle, who showed great interest in my research topic and in the research centre where I worked. To gain knowledge and experience working with colleagues from other universities and countries, I asked Alain to work with me and become my co-author. He agreed, and improved our paper by re-writing some sections, commenting, and making the paper more interesting and competitive. Edward-Elgar Publishing has plans to publish the book "*Sustainable development in organizations – Studies on innovative practices*" with this chapter during 2016. Dzamila Bienkowska, Malin Tillmar, Ingela Sölvell, Evert Vedung, and not least, Magnus Klofsten has made valuable comments for improving the paper.

Study 3

Paper 3 is a result of close collaboration with Luleå University and the co-authors, Professors Joakim Wincent and Håkan Ylinenpää. The paper uses the same data as Paper 2, and all co-authors actively participated in the idea generation process. Joakim Wincent took prime responsibility for data analysis while co-supervisor checked and clarified the results. Both my supervisors commented the work extensively. The paper was presented at the XI Triple Helix International Conference, 8-10 July 2013, in London (UK) and has since been reviewed several times by Henry Etzkowitz, Håkan Ylinenpää, Karl Wahlin, and Ingela Sölvell, who all provided valuable comments. Paper 3 is to be re-submitted to the *European Planning Studies Journal* before the day of this dissertation defense.

Study 4

The idea for Study 4 came in 2010 before I began my doctoral studies, when Magnus Klofsten wrote a working paper using empirical material that he had collected that year. All authors revisited the materials before the start of co-authorship. Magnus made major revisions of the working paper while Dzamila Bienkowska, Ingela Sölvell and I wrote some of the sections and worked with the reviewers' comments. The first draft of this paper was presented at the International High Technology Small Firms Conference, 28-29 of May 2013, in Manchester (UK). The editors of *the Journal of Industry and Higher Education*

became interested in this paper and asked us to submit it to their journal. The review process led to a significant development of this paper and the paper was published in February 2015.

Study 5

I am the sole author of Paper 5, which summarizes the results of Papers 1–4. Magnus Klofsten proposed the idea, which I was resistant at first. The experience, however, has been rewarding, and I have learned much about writing policy papers. Anna Bergek and Evert Vedung revised the first draft of this paper, and Einar Rasmussen provided valuable input at the seminar in Bodø (Norway). Magnus made major contributions to revision. I presented Paper 5 at the 17th McGill International Entrepreneurship Conference, 2-5 September 2014, in Santiago (Chile). I had the option of publishing this paper in a book of the conference proceeding, which is still in the initial stage, but decided instead to publish it as a chapter in the book series “*New Technology-Based Firms in the New Millennium*” due to interest shown by the editors and speedier publication. Paper 5 was accepted, and the paper version of the book is available from September 2015.

In summary, Papers 2 and 4 were a rather simple journey when the paper was nominated or had good potential for publication by sources connected to the conferences. Mainly, it was a matter of working with comments from the reviewers, committees, and editing boards. Paper 5, for example, had simultaneous possibilities for publication by two sources. Papers 1 and 3 were more complicated and time consuming than the others, however, after several trial-and-error attempts, and many revisions, the process is nearly complete (Paper 3) or complete (Paper 1). The review process has improved both papers. Thus, publication is undoubtedly tough, but knowing these papers would be published, given time and effort and the work of excellent collaboration partners, made the process worthwhile.

Combining theory building and testing – generalizability issues

Beliefs about the nature of theory differ, and reaching a consensus on this question appears to be challenging (Alvesson & Deetz, 2000). In simple terms, theory can be understood as a small set of research ideas and a basic aim of science (Sutton & Staw, 1995; Kerlinger & Lee, 2000). Depending on country and subject, success in PhD work requires expansion and development of existing theory, or development of new theory. A method is a tool for steering the process of theorization. In more general terms, and especially important in pragmatic philosophy, theorization is a matter of pre-understanding of studied phenomena and their interrelationships and anticipation of potential consequences. In this thesis work, understanding and anticipation rose from preliminary investigation of the literature, experience, and discussions with participants. Everything that was discovered which found support in the empirical material and study results was considered a truth following the reasoning of Dewey (1941). Thus, Whetten (1989) regards communication, collaboration between researchers and participants, and the study of existing theories to be central to theorization.

Hong et al (2005) suggest a four-step methodological approach, which would allow researchers to base their investigation on real-life events. These steps are selection of

phenomena through observation, identification of common components across different events, abstraction methods to discover commonalities and relate to existing theories, and testing of the hypothesis/theories. This approach centers on the explanatory nature of theory and proposes testing as a main tool for theory development. One of the main aims of the projects in this research was to test theory and, in particular, to identify causal relationships between variables (Hart, 1998). Such studies are known for their valuable theoretical contribution by incorporating new results into original theory and moving theorization to maturity (Popper, 1965; Hempel, 1966; Weick, 1995). In contrast, other studies are of an exploratory nature, using qualitative techniques such as observations and case studies that aim to improve understanding of the phenomenon and clarify a problem or a process (Hart, 1998). This dissertation contains such studies too. They strive to build theory, especially theoretical constructs and propositions (Eisenhardt, 1989; Chalmers, 1999; Eisenhardt & Graebner, 2007). This thesis incorporates both approaches: the first, qualitative, step strives to build theoretical grounds while the second, quantitative, step tests generated theory.

Relating the nature of studies to issues of generalizability shows that theory testing techniques with large samples are best suited for generalizability, especially when the focus is patterning in similar setting and contexts (i.e. standard view of seeing world) (Welch & Comer, 1988). Another type, the theoretical generalization type, often results in studies with qualitative approaches (Ritchie & Lewis, 2003). The studies in this dissertation have investigated a total of around 140 cluster initiatives from Europe, which can be characterized as a large sample study and from which, according to Eisenhardt & Graebner (2007), common patterns and future trends suitable for proposing generalizations can be identified. Considering each study by itself, however, shows that the generalizations in Studies 1 and 4 are more theoretical and less empirical, while in contrast, 2 and 3 provide the empirical grounds for generalization of similar settings and contexts. Study 5 is a conceptual study summarizing previous results with a focus on generalizing cluster initiative characteristics among European countries, even though the primary intent of the study is its policy recommendations.

Theoretical generalizations mean findings are closely related to their theoretical applications (Ritchie & Lewis, 2003). Thus, Papers 1 and 4 are built on a strong theoretical ground of cluster, cluster initiative, and intermediary organization. The empirical data seem to fit the proposed mix of theories and provide grounds for further development of these theories. Moreover, the symbiosis of these theories used, for example, generalizations of constellations of actors, intermediary activities, and performance indicators. Studies 1 and 4 are multi-case studies; they use in-depth studies of four and five cluster initiatives, respectively, and can even be viewed as a basis for empirical generalizations of settings and contexts (Eisenhardt, 1989). But to be generalizable in such terms, new cases should be anchored in earlier ones and the research process must be documented in detail. Studies 2 and 3 are questionnaire based and are eligible for both generalizations types because they are built on previous qualitative studies, which are already generalizable to a certain extent. In addition, their more numerous samples increase the power of generalizability.

Confidence in the findings – issues of validity and reliability

Validity and reliability largely determine the quality of a study. Serious work towards improving the validity of studies would increase their impact (Yin, 2003, Creswell, 2009). Qualitative studies rely on qualitative validity, reliability, and generalizability (Greene & Caracelli, 1997). Generalizability can also be viewed as external validity; the degree of generalizability is determined by how well applications of the generalizations in new settings, with new people and samples, produce analogous results. Quantitative studies rely on internal, external, statistical, and construct validity. In mixed methods studies, quality is characterized by legitimation, which touches upon a number of aspects: sample selection, sample size, follow-up, agreement of results, bias in data collection, adequacy of procedures, and compatibility of research questions (Onwuegbuzie & Johnson, 2006). Using a lens of proposed confidence determinants, each study type is overviewed and assessed.

Studies 1 and 4 – confidence of qualitative results

In qualitative studies, validity includes checking the accuracy of the definitions, measures, and procedures used (Creswell & Plano Clark, 2007). Validity is most often at risk in interviews; for example, it is difficult to minimize subjectivity in how the interviewer asks questions and how answers are interpreted. To illuminate this potential risk, Studies 1 and 4 used (i) working definitions of cluster initiatives formulated by other experts in the field and (ii) interactive techniques. Priority was given to definitions generated by others, even when definitions resulting from the findings in this thesis could have been used. Using the definitions of others simply enriched the definitions the author of this work was able to formulate based on her findings. The aim was to ensure the validity of the studies by basing it on the knowledge of others, who most probably had more experience in the field. Before a cluster initiative was selected for a study, it had to fulfill the inclusion criteria, which included full accordance with the cluster initiative definition.

Interactive techniques included sending the respondents summaries of the findings to confirm their accuracy, and adapting the findings according to their suggestions for improvements. This was also done with the results and analysis. The respondents were asked to review and comment the analysis and discussion sections in ways that, in particular, would increase the value of the study for practitioners (a key aim in interactive research). In addition, several interviews with the same respondent were verified with information from other sources such as websites, annual reports, and operation manuals. Some cluster initiative representatives were even closely observed (e.g. SMIL, TIME). The aims were to confirm, clarify, and deepen responses while increasing study trustworthiness and credibility (Creswell & Miller, 2000).

Besides many advantages, the interactive approach has several constraints; in this research, the approach was designed to minimize possible unwanted consequences. First, the interactive approach is time consuming and costly: Study 1 comprised only five cases, and Study 4 used some of these same cases, but with different points of investigation. Other expenditures such as phone conversations, working space, and trips were also minimized. Second, in the interactive approach, the researcher's role easily loses definition: the role of

the researcher was pre-defined and step-by-step research activities were settled to avoid possible role switching and to illuminate bias.

These were some of the strategies used to increase validity. Other efforts to improve the validity of the studies included striving to realistically depict the cluster initiatives by presenting both sides, positive and negative aspects, as well as presenting multiple perspectives on findings' interpretations. Creswell (2009) suggests that to improve validity and reliability, researchers should present negative or contradictory information and multiple interpretations of this information, linked for instance to historical development and to individuals' background and gender. Studies 1 and 4 did this to the extent possible, however, the nature of the studies made it difficult to account for respondents' backgrounds and gender, when not linked with organizations, for example personal traits of entrepreneurs.

Use of phone interviews instead of written forms and of semi-structured questions to guide the interviewer and respondent, with some questions open-ended to allow for more information from the respondent, lifted validity and overall quality. Several times during data collection for Study 1, interviewer observed that the interviewees knew more than their responses indicated. The additional questions and time allowed by the interview design for discovering more detailed information to identify causal relationships across the key issues from the respondents also improved validity and quality. Paper 1 illustrates the chain of evidence beginning with the research question and taking the reader through the history of the choices made by the research group and the respondents in the participatory approach, while presenting an organizational history of cluster initiatives. Paper 4 provides evidence from a methodological perspective, describing how the questions were chosen, how respondents were contacted, and how the purpose of each round of interviews affected results. These details allow readers to observe the entire process and make their own assessments of the study. Yin (2003) states that allowing the reader to follow the research process and view the information received increases its validity.

Reliability, which means that the same research design would produce analogous results in other settings, is mainly a reduction of biases and errors (Yin, 2003; Gibbs, 2007). This includes insuring database accuracy by cross-checking interview transcripts with all collected materials (e.g. written notes, records and other communication documents) and by asking peers, both those involved and those not involved with this research, to check all materials. All empirical materials and even feedback from peers are archived and can be used to repeat the methods exactly. Access to these materials is also a way of reducing potential bias.

Studies 2, 3, and 5 – confidence of quantitative and combined results

The most often-discussed risk in quantitative studies is use of inadequate definitions and measures. One reason is because the results of quantitative studies are often directly used by policy makers in policy design, by statisticians, and by economists in forecasting. To support construct validity in the quantitative part of this research, a definition of cluster initiatives formulated by other authors was used as a table definition (as in Studies 1 and 4) due to their longer experience in the field and potentially richer databases allowing higher

level of generalizations and abstracting. The working definition of cluster initiatives generated by this thesis was found to be too narrowly focused on the aspects investigated in detail here and could potentially miss important of initiatives characteristics. Moreover, a smaller sample of this study comparing with the databases used by Ketels & Memedovic (2008) was found to be less numerous and predictive. Other aspects of validity are also relevant for qualitative studies, especially since they are considered the first step in designing a quantitative approach. Some of these aspects include elimination of subjective interpretation by using a largely interactive setting and importance of other peers' advice of the whole research, accurate time and resource planning, provision of realistic even if not so well-fitting aspects, consideration of historical perspectives and form of phone interviews allowing personal interactions.

The other concern of construct validity is adequacy of measures, which is difficult when the field is reasonably new. The questionnaire was designed using entrepreneurial, small firm, and other organizational studies, but the number of pertinent surveys in the literature was only about 12 at the time. Some good recommendations, however, were found: managerial studies advised using 7-point Likert-like scale, high-technology firm studies recommended measurements of two time periods, and the few researchers investigating cluster initiatives proposed actor/activities measures. Basing choice of measures on studies in the literature is one of the easiest methods indicating correctness of measurements. Later in the design process, practitioners and theorists assessed all definitions and measures and provided valuable input for improvement. It is viewed as a time consuming, but at the same time, quality assurance procedure ensuring construct validity (Creswell, 2009).

One of the challenging aspects of designing these three studies was the question of population versus sample. The sample of all cluster initiatives in the eight countries, which had been extracted from two large, well-known databases, in addition to open Internet search using Google, seemed at first to cover all populations. The intent was always to address the whole population rather than generalize results of an extracted sample. However, there was a sense that some cluster initiatives could have been missed or were not registered online (a high risk for initiatives because of their project-based, temporary nature), which would mean that the population was incompletely captured. To avoid expectations that the sample covered the entire population, when extraction had captured only a limited sample, the sample was designed to be one that was eligible for generalization. This decision was driven by the desire to keep in mind that drawbacks or unknown sides of what we think we know can always appear. Moreover, because the sample criteria allowed inclusion of a wide spectrum of initiatives, the aim of capturing common patterns and mechanisms of operations was made easier. Fortunately, the initiatives' operations were found to be largely similar in actor, activity and organizational contents in the selected sectors and countries – as was anticipated in the initial propositions. It was even a feeling that they have followed similar development paths. The observed patterns showed a logical link between existing theoretical arguments and the data. This allowed extraction of patterns of their operational mechanisms and generation of models.

One of most challenging issues was the contradictory information produced in the database searches and interviews. For instance, the age of the cluster initiative recorded in the database was often lower than the age stated in the interviews. Such differences required substantial effort to investigate. Interview information was considered more reliable because it included the time when initiatives were in operation before formal establishment, which the databases did not. This issue was critical, because age was one of the sample criteria and reliance on database information only might have excluded relevant initiatives from the study. In other areas, searches often produced limited information on the focus sectors of the initiatives and out-of-date information on staffing. Thus, the interviews began with these questions in order to determine whether an initiative met eligibility criteria for the study.

Statistical conclusion validity is an important component in the assessment of validity in quantitative studies (Creswell, 2009) and concerns the correctness and adequacy of statistical power and inferences. To assure this, several analytical techniques such as factor analysis, sequential regression, and correlation matrices were tested before an analysis method was chosen. Preliminary relationships between 200 variables were explored. The methods that were tested are known for their ability to capture large amounts of data in a sensible way, which helps to visualize general patterns (Trochim, 2006). Together with the tests, the reliability and validity specifications were programmed and reported in Studies 2 and 3 (e.g. VIF, tolerance, significance levels, correlation of determination [R^2 , goodness-of-fit], and explanatory power indicators). The results of the confidence tests did not exceed the limits proposed by Field (2009) and Hair et al (2009).

Occasionally, an interviewee would give an unexpected response, due perhaps to misunderstanding the question, stress, time limits, or a desire to create a better impression of the initiative than actual circumstances allow. Responses identified as outliers were removed from the analysis to minimize their influence on mean value and, thus, on conclusion correctness. For each question, between one and five responses were considered outliers and removed. Outliers are potential threats to internal validity, for which there are several methods for managing, including the one above (Field, 2009).

Along with threats to internal validity, external validity threats (i.e. reliability threats) must be addressed in survey studies. These threats are linked with such things as incorrect statistical inferences made concerning other persons and settings, both at the actual time of research and in future forecasts. Many things can endanger external validity, including resource limitations and uniqueness of cases. The literature proposes limiting generalization of such results and collecting periodic data to cover such cases (Cook & Campbell, 1979). The design of Studies 2 and 3 assumed pre-communication with all cluster initiatives on one or more occasions, which allowed their uniqueness to be captured and limited threats connected with mistaken pre-understanding and forecasts.

In mixed methods studies such as Study 5, quality is characterized by legitimation, which includes several validating aspects (Onwuegbuzie & Johnson, 2006; Creswell & Plano Clark, 2007). Study 5 data were extracted from the qualitative and quantitative studies dis-

cussed above; thus, the validity and reliability measures from those studies affect even Study 5.

Methodological limitations – sources of potential errors

In research, some aspect or other is often missed and not fully addressed, for several reasons: such as, time and resource limitations and situational factors, which the researcher often has no power over. Philosophical views, which depend directly on the researcher, affect research design in a positive or in a negative way. Undoubtedly, this research has its strengths and weaknesses; however, my research strategy was to illuminate potential errors to the best possible extent. The main philosophical view underlying this research allows pluralism, which is preferable to being restricted to one particular issue, especially when striving to generate an overall picture of the phenomena (Patton, 1990).

Mixed methodology (use of both qualitative and quantitative approaches) could be viewed as a dark side of this research. Many state that it is a great advantage, though traditional users of a single approach might criticize the small number of cases and the shallow analysis of mixed methodology, especially in cross-comparisons (Webb et al, 1966; Fielding & Fielding, 1986; Eisenhardt, 1989). Such views assume low representativeness in the first, qualitative phase of this research and limited interdependencies, which would cause difficulties in generalizing findings, from which realistic hypotheses could be drawn in the next phase. Proponents of quantitative methods would probably point to the small sample and low response rate in Studies 1 and 4 and request additional data. Such comments show that nothing is perfect and improvements can always be made, but imperfections should not be considered grounds for passivity and less research; on the contrary, the best of existing methods for the situation would still further theory development and affect the world. This vision guides the research presented here, which relies firmly on the combination of methodologies, and the chance to illuminate the research question more finely than usage of a single methodology would. Mixed methodology is viewed not only as a way of combining theoretical and practical contributions but also as grounds for competence development in techniques of mixed approaches and aspects, greatly contributing to future career growth.

Other potential limitations are choice of working definitions, measurements, and combined theory sets. The section of this thesis on study confidence discusses working definitions. Because creating a new definition could easily have become overambitious and a reason for criticism, measures were usually selected after consulting studies in managerial, organizational, and regional development fields to identify current practice, including consulting the work of other researchers closely involved with the same phenomenon – cluster initiatives. However, there are a few invented measures and variables used in this thesis; for example, to assess change in intermediary activities, frequency of delivery, and available resources. These new evaluation tools were developed on logic and common sense and tested by us as well as by external theorists and practitioners. This procedure most likely pointed out those measures most suitable for variable assessment and practical use. Regarding combined theory sets, common sense indicated that theories relying on empirical findings should be combined in order to

pinpoint the varied nature of cluster initiatives, clusters, and intermediaries. It may well be that some aspects fit the theories poorly and some theories were missed. One thesis is incapable of describing the broad and multi-faceted organizational field or cluster and commutative theories. Future research could address this. Furthermore, the other limitation in this regard should be mentioned that the theories used were seen as compiling one another. The aim was not to find contradictions between these, but rather search for possible combinations in order to reflect multidimensional cluster initiatives nature. Despite this, some contradictions in definitions and overall characterization of the initiatives have been found and revealed in this work as for example in the section “the other side of cluster initiatives”, but also supported the conclusions drawing.

The domain of the sample for this research is a potential limitation in this thesis. Studies 1 and 4, the qualitative studies, focus on Swedish cases while the sample in Studies 2 and 3, the survey studies, was spread among eight European countries. This must definitely be considered, especially since the Swedish case studies became the foundation of hypotheses for the European sample. The only justification for this is that cluster initiatives are seen as entities differing mainly in purpose and governmental input among the countries, while their other mechanisms are similar. Sölvell et al (2003) and Ketels et al (2006) highlighted this in their studies, which were also based on multiple countries. Broekholt & Thuriaux (1998) also show that these eight countries, including Sweden, apply similar approaches and cluster policies. Although the work of these researchers support the choice of domain for this study, domain remains a matter of special attention and care must be taken when making comparisons.

Possible threats to the appropriateness of this choice of study domain could be an inability to accurately summarize and abstract the findings, and even incorrect abstractions due to adoption of a single interpretation of the various cluster initiatives (cf. Eisenhardt, 1989). On a more personal level, the vast study domain could raise language issues such as misinterpretations of questions and of tones of conversations and cultural differences, resulting in a faulty picture of cluster initiatives, and a high number of outliers (i.e. responses which did not fit a common pattern of responses). The working regimes of some of the respondents – in some countries the leaders have a fairly calm working regime while in others they can be part of stressful, dynamic environments, running several activities simultaneously – may have caused some of these threats.

Several techniques were applied to address some of these issues; first and foremost were the telephone interviews, allowing a personal discussion. There were also: the preliminary edit of the questionnaire by professional translators and testing of the questionnaire on an international audience; preliminary research on each initiative, including studying their website and select regulatory manuals; and preliminary conversations with the respondents to choose an appropriate time for the interview. I believe that these techniques, and their early implementation, counteracted the limitations discussed above in the best way possible. None of the involved researchers noticed any language problem and out of scope responses. The few outliers that did appear were removed from the database using least harmful techniques aiming to still leave databases valuable and able to generate trustworthy results.

Another threat of research based on interviews is the unconscious influence of the researcher on respondents (Patton, 2002). For this reason, the research design required several researchers to be involved at each step, who would review the results jointly and use the same standards and explanations due to pre-study calibration. They also checked the accuracy of the coding and helped import data into the statistical software. Involving many persons in the interview and data treatment could add risk, but the process was calibrated during three weeks of seminars before the study began. During the seminars, ambitions, visions, and techniques as well as the theoretical foundations of the study were discussed.

The discussions in the literature usually concern response rate, and all sources in the literature reviews for all studies took up this topic. This aspect was met in each source being read while preparing data collection process. The response rate for this study was 53%, which is a much higher rate than reported for other, similar settings (cf. Cole, 2005). This percentage represents 136 cluster initiatives and this number is found to be eligible for all statistical analyses used in this research. This would probably not have been achieved using online questionnaires, so personal contact with respondents is essential for improving response rates. Of special importance throughout data collection was the presentation of researcher affiliation – Linköping University and VINN HELIX Excellence Centre – which contributed greatly to our high response rate. This appeared to be confidence-building and, among others, eliminated fears of viruses and spam (related to those responded on-line, but also to other respondents increasing credibility of the study).

These potential limitations might not be an exhaustive list of the problems that might have occurred, but they reflect the risks addressed in this thesis, and the studies present the techniques used to solve these problems.

Summarizing this chapter it is seen that throughout the time of this PhD work several philosophical and methodological choices have been made. These choices can be both advantageous and disadvantageous, which are discussed mainly in section about confidence of the findings and limitations. The main strategy behind these choices was to gather a broad understanding of the studied phenomenon while also gaining experience from different methodological approaches and methods of data collection. It has been done through mixed methodological approach where the studies of both qualitative and quantitative nature as well as different data collection techniques as interviews, observations study of documentation and survey. This work strived to become original by the appropriation of the techniques of interactive research supported by the initial choice of philosophical stance – a participatory approach together with the pragmatic one supporting multiple methodological approaches. The author has also wished to differ the work by summarizing the findings of papers one to four in the last more conceptual paper 5, which is a part of this thesis and serves as natural concluding remark for the appended papers while this cover essay on more analytical level synthesizes those.

4. MAJOR FINDINGS AND DISCUSSION

This chapter begins by discussing the connections between the papers and the ideas behind their construction. This is followed by brief answers to the research questions, which summarize each paper's major findings (see Table 1 in the Introduction for a short overview of these relationships). The chapter finishes by discussing these answers using a frame of reference, and findings.

Connecting the papers – individual inputs

The five thesis papers form three groups, where exploration and the desire to understand drove the first group (Papers 1 and 4); testing, the second (Papers 2 and 3); and formation of concrete proposals for policy improvement, the third (Paper 5). The thesis was designed to draw a comprehensive picture of cluster initiatives. The first stage in this thesis sought to clarify four essential aspects: type of entity, its leaders, its activities, and its success and failure factors. The literature contained some information, which served as a basis for study design. The preliminary explanations that were found for these aspects allowed two models to be generated: an actor model and a success factor model; these were major steps in developing the existing knowledge base.

The second stage sought to verify whether the models were valid for other cluster initiative examples, which would help to generalize this result and apply models to different kinds of cluster initiatives. However, Papers 2 and 3 went beyond verification of the models and explored membership and activity portfolios at various stages of maturity. These findings provided insight into not only maturation patterns but also special practices in management and development dynamics of cluster initiatives. The final paper summarized the important findings from the first four papers to generate a picture of operational mechanisms in cluster initiatives, including facilitators and hinders. For most hinders, potential solutions for turning these into facilitators were found. This is important because the work in this thesis witnesses the great potential of cluster initiatives to have a positive impact on economic and societal development. Overall, the five papers highlight the important organizational features and core managerial concerns of cluster initiatives in order to build a platform for developing coping mechanisms in the face of challenges and for reinforcing the strategic capabilities of initiatives. The platform is valuable for scholars, practitioners, and policymakers.

Interlinkings of findings between the papers and with the research questions

What types of actors are found in cluster initiatives and how do they interrelate? (#1)

Papers 1, 2, and 3 found that the actor constellation in cluster initiatives comprises four groups: the initiative itself including its leaders and employees, key players (main financiers and providers of other facilities interested in development of the initiatives), and support (providers of resources from time-to-time and participants in organized activities) and target groups (membership fee-payers and active participants in the activities. i.e. customers) (for more detailed description of these actors see Paper 1). A small group of individuals and employees drive cluster initiatives; however, membership can be large and include local, regional, national, and international members from various fields. Tasks such

as operative, strategic, and resource provision are assigned to each actor group, which performs several of these tasks simultaneously on a volunteer basis to achieve the common goals shared by all groups. The mission of the initiatives is to fulfill the needs not only of the members but also of a broader audience containing future members of the four actor groups. The amount of members might enhance the longevity of the initiatives. These groups can change composition over time depending on member contribution and activeness in the initiative, but also from age and maturity of the initiative.

How are cluster initiatives organized and how do they intermediate? (#2)

Papers 2 and 3, and Paper 1 (in part) demonstrate that cluster initiatives are small organizations that arrange brokering, exchange, and networking activities. Through these intermediary activities, the initiatives address the unmet needs of their members and encourage participants in a broader audience to become members. By organizing the activities they also aim to assist in the achievement of regional development dreams. Over time, this builds the visibility, legitimacy, and market reputation of the cluster initiative. These functions are a special characteristic that initiatives share with various types of intermediaries. In addition, the roles of broker, networker, and exchange mediator are dynamic and assumed on a needs basis. These findings indicate that cluster initiatives should not be confused with clusters, but rather identified as intermediating networks and organizations.

What types of success factors are identified behind the performance of cluster initiatives? (#3)

Paper 4, but also Papers 1 and 2 (in part), identify five success factors for cluster initiative management and survival that focus on three main aspects: operations, core actors, and critical mass of members. The success factors are qualitative, anchored in the surrounding context, and a framework for management. They are able to assess different types of initiatives, and provide an overall picture that captures the dynamic of their development.

What policy implications can be formulated for research and practice with regard to initiatives' management? (#4)

Paper 5 summarizes the implications stemming from Papers 1 through 4 and constructs a framework for overarching policy recommendations that address limitations in current policy and suggest ways of nurturing the emergence and growth of cluster initiatives. Four recommendations propose balancing funding opportunities for all cluster initiatives, facilitating multifaceted membership and varied activity content, and generating holistic assessment tools. Expectations from the implementation of these recommendations are mainly positive.

Discussion: Linking findings to the research questions and theory

This section discusses the important aspects raised in four research questions formulated in the beginning of this dissertation on general level. They address attributes such as actors and relationships, modes of organization and intermediation, factors defining performance as well as policy implications. It serves as a platform for conclusion drawing further in this work.

Cluster initiatives' actors and their relationships

One result of this thesis is an actor model illustrating the variety of actors involved in cluster initiatives, such as the cluster initiative itself, key players, and support and target groups, and the heterogeneity of the settings: local, regional, national and international arenas. The model also provides insights into the working mechanisms of these actors, which can be found in small, medium and large businesses; municipalities and public administration; development agencies; universities and training institutions; and chambers of commerce. Heterogeneity in the actor constellation is important and has been historically discussed in the works of Marshall (1921) and Dahmén (1950). They underscored the value of a highly interactive setting for achieving innovation and economic growth. Porter's (2000) findings reinforced the importance of heterogeneity, highlighting the central role of "supporting industries" (e.g., intermediaries and other support organizations as cluster initiatives) and their ability to support networks of various actors, and thus, facilitate regional competitiveness. The beginning of the 21st century brought the Triple Helix breakthrough, which has demonstrated how the three groups of actors – public, academic, and private – can collaborate and stimulate development (Leydesdorff & Etzkowitz, 2000).

The Triple Helix model allows cluster initiative membership and networks to be characterized as a Triple Helix combination that includes two or all three types of actors (cf. Leydesdorff & Etzkowitz, 1996). Under the Triple Helix prism, the classification proposed in this thesis can be viewed thus: The key players are national and regional municipalities, development agencies, and businesses of varying sizes. The support group contains actors from the local and regional levels. And the target group consists of actors such as private firms, the local university, and the municipality, which usually contribute through annual fees. In simple words, as Dahmen expressed it (1950), the target group comprises the clients or customers of cluster initiatives. Regardless of which combination of actors characterize a cluster initiative, academia is now on a level with the other two groups: that of a body driving innovation and growth; it is no longer an "ivory tower" that only provides training (Etzkowitz, 2002). Along with public actors, academia was found to be very active in the development of cluster initiative identity and capabilities. The involvement of businesses in the initiatives can be described as a prolongation of their own mission. Sometimes, interests of one or several of these actors can dominate the interests of other actors; due to their middleman position, cluster initiatives are able to balance relations between all involved by organizing specific activities or involving new actors in less-influential groups. In this way, cluster initiatives foster dynamics that support the development of initiative members and the initiative itself.

However, this first description is deceptive in its simplicity; the diversity of cluster initiative settings and actors complicate clear definitions of the customer and the owner. It seems to be especially challenging when each Triple Helix group represents both customers and owners (cf. Austenå, 2011; Lindqvist et al, 2013). For example, key players may demand reports on expenditures and steer the development path while at the same time participating in and exploiting the benefits of delivered activities. The situation is similar for other cluster initiative actors. The most challenging appears to be the position of cluster initiative leaders and employees, who might be independent individuals but could also be representatives of any membership group. As independent individuals, they are service

deliverers for cluster initiative members; but if the latter, the cluster initiative itself, as an actor, may simultaneously contain clients, owners and organizers. As the model was being developed, this peculiarity required special attention and resulted in a general approach that was relevant and suitable for each initiative. When explaining the specifics of each cluster initiative, however, the model may serve as a guideline, requiring some level of adjustment. Despite the complexity of actors' tasks and division of roles, cluster initiatives seem to be solving real-life dilemmas and moving the whole of the development mechanism forward. As this thesis shows, the clearness of the main mission and the allocation of tasks among all involved make this possible (cf. Klofsten & Jones-Evans, 1996). This is also what holds and links the stakeholders together as well as fosters a strong driving force and joint effort among members for achieving common goals (cf. Ketels & Memedovic, 2008).

Thus, cluster initiatives depend heavily on the involvement of various members and their willingness to be active (cf. Davidsson et al, 2010). Several reasons explain such dependency; for example, the need for assistance in building identity and legitimacy, for financial support, for local anchoring, for promotion among native actors, and for negotiating and participating community. Common governance and collective action among those involved, as in a "commons", is another need that was mentioned earlier as a reason behind dependency (Ostrom, 1990). On the other hand, to achieve certain advantages in return for delivering support and anchoring, the actor groups must remain continuously interested in the initiatives; thus, to keep the interest of the members alive, the initiatives' ability to maneuver, adapt, and balance conflicting interests is crucial. However, the task of fulfilling one actor's interests sufficiently while addressing the expected wishes of other, possibly conflicting groups is a challenging one for cluster initiative leaders. Open communication, transparency and negotiations are the main enabling tools for sustaining balance and the various levels of satisfaction, and thus, the "good health" of cluster initiatives (cf. Aziz & Norhashim, 2008).

The relevance of this model classification is further reinforced by an inalienable element of cluster initiatives: the individuals. The model does not address them directly, but they are assumed constituents of each classified group. They are the driving forces of the cluster initiative on the whole and of its individual constituencies (cf. Lundequist & Power, 2002). Foremost are the founders, the leaders or central individuals who form the backbone of the initiative and use knowledge and experience from previous forays to interlink the actors surrounding the cluster initiative (Shane & Venkataraman, 2000); entrepreneurs are considered sources of economic development (cf. Schumpeter, 1936). Their other special task is to communicate mission, vision, and operative directions between networking actors, and to bridge any structural holes; these central persons thus act as brokers (cf. Burt, 2002). But the efforts of these individuals, especially if they are volunteers, are minor and temporary, considering the number of networking partners. One outcome of this thesis was the discovery that involvement of more entrepreneurs in the initiatives was needed to ensure their survival. Undoubtedly, entrepreneurial passion and effort links the actors, but the daily bread of initiative employees, can be viewed as behind-the-scenes entrepreneurial operating power.

Cluster initiatives link various actors and individuals, and the more actors who are involved, the more newcomers who are willing to enrich this symbiosis. A strong identity – for which current initiative members, and in particular, influential ones such as the regional municipality are responsible – seems to be an important factor related to the number of newcomers. Influential members tend to promote initiative efforts on broader national and international levels; along with broader recognition, maturity is an important factor in building a critical mass of members (i.e., a large group of varying types of members, constituting a good basis for member exchange). The opposite can also occur; by exploiting their power to a full degree, influential members may cause a decline in the number of involved members (cf. Arthurs et al, 2009). Being aware of this, cluster initiatives should pay special attention and use appropriate management techniques, in the face of such diversity, to ensure the satisfaction of the greatest number of members, including those who are less influential.

Cluster initiatives' mode of organization and intermediation

Another outcome of this thesis was the characterization of cluster initiatives as organizations that must be skilled at finesse. Finesse is a particularly valuable skill, perhaps crucial to survival, since initiatives represent all combinations of projects, networks, and organizations and must possess a reasonably flexible structure. For this reason, the literature often refers to cluster initiatives as hybrid organizations, because they combine organizational and networking features (cf. Etzkowitz & Ranga, 2011). The other important characteristic of cluster initiatives that this thesis discusses is entrepreneurial spirit (cf. Lundequist & Power, 2002). A great ambition of leaders and financiers is to sustain this spirit from initiation on, throughout the entire life cycle of the initiative. Initiatives are often launched by several entrepreneurial and driven individuals, and they tend to serve only as long as their passion remains alive. They are the primary platform for maneuverability and the continued fulfillment of member needs.

Maneuverability allows cluster initiatives to fulfill their roles of “servants” (e.g., balancing between members to achieve common goals) and “organizers” (e.g., initiating changes and organization of activities on demand). A servant role is almost always reinforced by an active role of organizer, which is intertwined in cluster initiative practice. These roles are sufficient to equip cluster initiatives with the ability to act in contradictory decision settings, deal with conflicting opinions, and manage situations where members are unaware of their needs. The nature of the servant and organizer roles has positive connotations, because cluster initiatives are still able to achieve their operative mission while satisfying stakeholder demands – thus fulfilling their overarching mission of development. At the same time, initiatives strive to preserve members' autonomy in the degrees of involvement and collective decision-making. The right to participate in decision-making related to initiatives' strategic and operational aspects as well as the possibility to limit or extend the degree of their membership is a rather attractive stand for regional authorities who become deeply rooted in the networks of these facilitating organizations.

Regional actors, along with other stakeholder types, perform the governance, decision-making and problem-solving functions of cluster initiatives. Staff that is temporarily or

permanently assigned by the stakeholders and working with development may also be bearers of entrepreneurial spirit in the initiatives. A consensus among these stakeholders in matters of common objectives and how to achieve them should be established with assistance from the cluster initiative, here in the role of 'servant', a convenient role for dealing with top-down steering, conflicting opinions, and stakeholder autonomy. The types of stakeholders governing cluster initiatives resemble very much those involved in organizations, where there are a managing group, employees, experts, a governing board, and partnerships (Sorensen & Torfing, 2005). If all of these are involved in the governance of initiatives to a full degree, then the cluster initiative could be characterized as an organization with a complex governance structure. This type of structure could be a potential problem for the organization. Although this type of governance is rare, many actors on regional and national levels tend to view initiatives primarily as led by a multi-leveled constellation of stakeholders (Fromhold-Eisebith & Eisebith, 2005). The situation that most commonly occurs is when one or two stakeholders are involved to a full degree in initiative governance while the other stakeholders are either unwilling to participate or participate to a limited extent.

But these stakeholders do not always coordinate their governance in cluster initiatives; therefore initiative would be better defined as a networking organization, where all members pull together in order to achieve certain goals. Closely involved actors who participate in initiative-sponsored social and business events daily characterize cluster initiatives as such organizations (Laur et al, 2012). If the cluster initiative has performed well in its role of a 'servant', the goals and responsibilities between stakeholders would already be assigned by stakeholders themselves, thanks to their governance input, before the scheduled time of their execution. The idea of a clear division of roles and goals is historical, when management was centralized and rigidly steered (i.e., Taylorism); Marshall, however, criticized centralization and rigid steering, and his and others' critiques softened and shaped the approach (cf. Caldari, 2007). So, when executing its roles properly, cluster initiatives bear the trust of its members and engender the sense of a common direction (cf. Dirks & Ferrin, 2001).

The other role of cluster initiatives emphasized in this thesis, that of 'organizer', describes how initiatives organize heterogeneous intermediary activities that address member demands for more jobs, a positive city image, a stronger local profile, industrial and technological development, and so on. This feature, intermediary activities, is the main reason cluster initiatives so closely resemble intermediary organizations. The networking arena of cluster initiatives comprises the main recipients of these activities, which can be of a brokering, facilitating, and procurement nature (cf. Howells, 2006) or as other scholars mention, of an informatory, a bridge-building, and an innovation-driving nature (cf. Moss et al, 2009). These activities are the main instruments for addressing member needs in cluster initiatives, but the list is long and includes many more types than already mentioned as for example training, monitoring and conflict resolutions due to the uniqueness of each initiative's mission, operational settings, capabilities, and membership constellations. Rooted in local settings and driven by a willingness to establish long-term relations with its members, cluster initiatives creatively design, improve, and adjust their activities. Each member tends to occupy a large share of the cluster initiative's attention. Such attention is given from the

time the member joins, and does not necessarily end when the member leaves; the initiative often wishes for the member to return and will occasionally spend time maintaining relationships with previous members throughout the lifetime of the cluster initiative.

Experienced members who have already had contact with intermediary services know what they want from membership while others only consider the final goal; for these, cluster initiatives, by taking a role of ‘organizer’, must transform the goal into activities suitable for its fulfillment. Using the Triple Helix classification, the following examples illustrate the types of expectations and goals that cluster initiatives deal with daily: academia desires networking contacts with firms to acquire research objects and disseminate research results; public actors use direct access to the private sector to design, test, and evaluate policies; and businesses see membership in cluster initiatives as a prolongation of their own mission (cf. Etzkowitz & Ranga, 2011). The important aspect here is that although members expect gains, they also provide something in return in terms of finances, competences, knowledge, and facilities – the classic “win-win” situation. Recognizing this, the Italian School states that success of each network actors would lead to performance of all involved (Becattini et al, 1992). Inspired by this, cluster initiatives are also based on the notion that efforts to provide qualified services would improve the performance not only of each actor in the network but also of the overall network. Thus, the superior performance of many is a way to attain legitimacy and a good market reputation: signs of sustainability (cf. Intarakumnerd, 2005).

In summary, an analysis of mission, driving force, governance approaches and applied roles of cluster initiatives indicates that these are not traditional organizations, but rather facilitating entities that strive through delivery of intermediary activities to optimize the prerequisites for achieving a Porterian cluster or a competitive region. In other words, cluster initiatives are neither clusters nor full-out intermediaries, but some unique combination of the two. The following subsections provide insight into how the characteristics of cluster initiatives, clusters, and intermediary organizations are similar to and differ from each other.

Clusters and cluster initiatives – how do they differ?

This dissertation reinforces previously raised propositions that cluster initiatives are a special type of entity that is organized in a specific manner and stand apart from clusters. Clusters could be viewed as the ancestors of cluster initiatives, where the cluster framework provides a starting point for understanding the initiative. The interchangeable use of cluster initiatives and cluster phenomena still occurs, leading to misperceptions (cf. Fromhold-Eisebith & Eisebith, 2005; Hanusch et al, 2009). One example of such a misperception is when a flagship company initiating collaboration of different actors in one geographic area is called a cluster initiative. Entrepreneurs who are venturing firms in clusters are also sometimes mistakenly called cluster initiatives. This interchangeability is seeded in rare theoretical and empirical evidence on the organization and functioning of cluster initiatives (cf. Mills et al, 2008). It is also rooted in top-down cluster policies that regulate entrepreneurial cluster initiatives, reducing their potential contribution and making them largely unrecognizable (cf. Moss et al, 2009; Swords, 2013), but there are also

other weakly developed aspects which this thesis discusses as “the other side” of cluster initiatives. The hope is that this dissertation and the following summary will help readers differentiate between these phenomena.

First, the shift in business focus from partnership development to innovation and efficiency fostered a geographic concentration of firms that was cluster specific and poorly designed for creating partnerships and networks (cf. Forsman & Solitander, 2003; cf. Barca et al, 2012; Chesbrough, 2013; Brown & Mason, 2014). Thus cluster initiatives, whose primary purpose was to facilitate collaboration and networks by organizing professionalized services, entered the picture. These, in turn, became a tool for linking co-located firms; initiatives became known as cluster facilitators (cf. Howells, 2006; Stewart & Hyysalo, 2008). This early aspect illustrates one way these closely related phenomena differ: clusters are the result of many separate independent decisions regarding location of business and cluster initiatives, on the principle of creating arenas to facilitate collaborations among actors. At times, even, the success of one is dependent on the efforts of the other and may be why cluster initiatives have been called the “inner arms” of clusters, improving cluster competitiveness and assisting entrepreneurial efforts. Initiatives have been found to be most influential during new cluster expansion and in mature cluster innovativity (cf. Sölvell et al, 2003; Ketels & Memedovic, 2008).

The second aspect that witnesses to a difference between the two is the need of cluster initiatives to employ personnel in order to achieve their organizational aims and objectives. Clusters, on the other hand, are formed on the sum of pioneering firms initiating networks in the regions each with their own employees. The efforts of these volunteers predetermine not only the success but also the failure of a cluster when they are insufficient or when firms lack needed competencies to bind networks together. Despite strong volunteer dedication, the level of development achieved by one cluster will not necessarily be mimicked by another (“one size does not fit all”) (cf. Tödtling & Trippel, 2005). Without especially assigned personnel for fulfillment of certain tasks, clusters have no clear flow diagram for making decisions and for assessing and monitoring their development path. In contrast, cluster initiatives have formally established aims and objectives as well as a staff for monitoring how well these are being fulfilled and for adjusting the course to the changing demands of their members. That is why cluster initiatives are sometimes called prerequisites for and adapters of cluster development: they make it possible to successfully implement well-known practices by adapting these to local contexts. Sometimes a cluster, driven by different aims and the need to organize different activities, will be associated with several cluster initiatives. This circumstance can accelerate the growth of several industries, when cluster initiatives locate in a territory to take advantage of cluster spillovers and, thus, influence cluster initiatives’ own performance and build legitimacy (cf. Ketels, 2009). Initiatives often access established cluster markets, products, and linkages, but this is done to identify constraints and new opportunities. With such actions, cluster initiatives help clusters compensate potential negative sides of policy reforms.

Membership is a third aspect differentiating these phenomena. Cluster initiatives have members; they receive benefits from the organized activities and in return contribute resources to the initiatives. Such formal relations are not observed between organizations

in clusters; rather, relations are bilateral and informal. Cluster initiatives compete to attract members from other initiatives, which make these entities even better in responding to the changing needs and demands of market actors. For example, very often cluster initiatives become competitors with traditional supporting organizations (e.g. regional development agencies) both of which aim to attract similar groups of actors due to delivery of similar intermediary activities (Rosenfeld, 2003; 2005). To survive, initiatives are pressured to react to market changes, which foster steady development and innovativity in cluster initiative services. In clusters, this dynamic is difficult to observe and even more difficult to measure due to unclear membership and vague organization of activities.

The last aspect that this thesis will discuss on the topic of cluster and cluster initiative dissimilarity concerns operational space: Cluster initiatives are able to operate out of various 'cluster spaces' and be connected to more than one region or small territory. Initiatives are often driven by the idea of internationalization and expansion into international space; thus, they seek to recruit international members, who facilitate their expansion into other countries where they influence regional development and clusters. In contrast, clusters are more often found in regional spaces. Cluster initiatives that succeed in widening their geographic domain have better chances for longevity and for making an impact on the international arena.

In summary, clusters and cluster initiatives are closely related phenomena in terms networking and collaboration between actors in order to make an impact on regional and national levels. These entities are less similar, however, in structural and operative content. Clusters and cluster initiatives influence one another, and the success of a region as well as of the entity itself depends largely on the operational outcomes of these phenomena.

Cluster initiatives –how the concept relates to intermediary organizations

Scholars have called cluster initiatives "innovative intermediaries" because of their mediating position between regional authorities, business, and academia and their provision of middleman services to their members (cf. Rosenfeld, 2005; Stewart & Hyysalo, 2008; Moss et al, 2009). Middleman services is one tool initiatives use to fulfill their mission; this structural position "in-between" others warrants the naming of cluster initiatives as intermediaries.

On the other hand, this work emphasizes that cluster initiatives are also organized efforts operating within a cluster or aiming to organize a cluster (cf. Intarakumnerd, 2005). Although initiatives play the role of intermediaries, organizing intermediary activities for various actors for a fee, their further aim is to fulfill a triple mission of added-value: to regional development, business growth and its own identity. They accomplish this via a portfolio of intermediary activities tailored to the needs of their members and a broader audience (cf. Sölvell & Williams, 2013). So, instead of delivering one-to-one services (i.e. to certain purchasers) similar to most other intermediaries, cluster initiatives focus on a many-to-many (i.e. to several different actors simultaneously) delivery approach (cf. Howells, 2006). This approach is similar to the combined deliveries of several intermediaries, allowing initiatives to be referred to as 'rescuers'. In its absence, an

initiative would need to be compensated by several different intermediary organizations (cf. Burt, 2000; Etzkowitz & Ranga, 2011); this underscores the value of initiative operations and reduces actors' dependency on multiple service providers.

The regional focus of cluster initiatives (if there is such) is formally captured in their development-oriented and non-profit goals, and regional or national public actors tend to sponsor initiatives (Perry, 2007). Intermediary organizations operate among private sector actors with formally established profit-driven goals and are sometimes sponsored by the municipalities. Compared with intermediary operation in the public sector, cluster initiatives are closer to public intermediaries, or to private intermediaries who have a large public share. The regional goals of public intermediaries are also explicitly named and followed and both public intermediaries and cluster initiatives tend to organize activities that are not of intermediary nature, such as fulfill member and stakeholder expectations, share marketing ideas, and assist in branding.

So, cluster initiatives can be called intermediaries, but they are actually more: they intermediate but their operations are more complex, constituting a more holistic strategy than would a simple intermediary organization. Thus, the influence of initiatives on regions is greater (cf. Lundequist & Power, 2002; Rosenfeld, 2005; Ketels, 2009).

Cluster initiatives' success factors

Cluster initiatives are special organizations, and to manage and measure their performance requires a complex approach. Cluster initiative success or failure is more than a measure of its economic results, similar was emphasized by Marshall (1921) in regard to industrial districts. The current view is that measuring success is much more complicated than in the early 1900s. Like for any other organization, success factors (which judge the quality of input from individuals) and success criteria (which judge the quality of the results) should be used. These include numerous aspects related to personnel, surroundings, and regulation, for example. Despite the difficulties in defining and using success factors and criteria, many researchers, including myself, strive to do just that in order to provide initiatives with tools for assessing external opportunities and evaluating themselves.

The literature rarely addresses cluster initiative performance, and when it does, the assessment tools are usually loaned from clusters – a different type of entity. The drawbacks of using tools designed for clusters to assess cluster initiatives include ambiguous interpretations of the performance indicators (even among highly committed actors, an indicator can be a success for one actor and a failure for another) and lack of standardized indicators (the literature contains more than one tool for measuring the same thing). Because cluster initiatives are unique entities, often use special activities, and have unusual organizational patterns, success factors and criteria easily become ineffective due to the need for situation-adjusted planning, scheduling, and monitoring. In such situations, qualitative models could be valuable assessment tools because they use no numeric criteria, which lack of routine behavior easily confounds. When numeric measurements register a “fail”, qualitative measurements can even up the balance and provide the initiative more time to show its true capability. Levels of ambiguity and uncertainty could be somewhat

reduced by introducing a general assessment model that is easily adaptable to any cluster initiative.

Focusing mainly on success factors, this thesis proposes a model that includes several qualitative performance indicators (i.e., both factors and criteria) for evaluating cluster initiative operations (idea, organization, and activities), core actors (driving forces and commitment), and actor diversity (participating critical mass: members constitute a good basis for member exchange) (Klofsten et al, 2015). At the same time, this work highlights that cluster initiatives are organizations linked to regional or local contexts, which influence their start-up and development. The external context – where cluster initiatives are anchored – is important for managers and theorists and is anticipated to be an important influence on all factors in the model, though to varying extents. These indicators are a holistic basis for assessing cluster initiatives, regardless of their specifics and phase of development. As any evaluation tool would, this model strives to be a learning tool for all initiative stakeholders.

The notion of management and assessment recognizes not only the inalienable role of leaders in creating prerequisites for well-functioning cluster initiatives but also the role that other stakeholders play in creating pre-conditions for good well-being and judging operational results based on their expectations and experience. In practice, these contributions of entrepreneurial individuals – striving to provide the best management and maintain results over the long term – reinforces the value to the initiative of their being actively involved in all aspects of cluster initiative life. Subjectively, their intuitive call for decision-making, despite its nature of trial-and-error, and their focus on developing success factors to achieve desired outcomes stems from experience and familiarity in leading the initiative. In a broader perspective, the intuition of a leader could be considered a success factor, mainly because it is based on experience derived from the external context.

The outcome of the model proposed in this thesis – with its actual and assumed factors applied in combination and reinforced by the success criteria – evaluates different aspects of the initiative. Traditional quantitative factors typically used to evaluate other organizations can enrich the factors in the model to improve the picture of a cluster initiative's achievements. Any factor by itself is unable to estimate a cluster initiative's overarching result, however, the model could be used as a quality measure of each factor. This would then mainly affect the implementation of certain procedures and changes in cluster initiative processes.

An analysis of this project in the context of the overall purpose of this study found that each factor in the proposed model interrelates with the others. This interlinking seems to be more important than any one input, as discussed in the following sentences. High levels of a factor, such as critical mass, may be difficult to achieve despite the efforts of both cluster initiatives and stakeholders. Attracting a large, broad mass of members, one of the prerequisites of maturation, is often a matter of time. This thesis shows that maturation, which in a positive sense possesses the potential for revitalization, is anticipated from initiatives attracted critical mass of stakeholders. Moreover, this mass (both intentionally and unintentionally), together with the eagerness of the driving forces and the proactive-

ness of the initiative visible in the innovativity of intermediary activities, is a good platform for attracting new and retaining existing members in both local and international spaces. The other side of maturity, however, is the risk of stagnation, which quite often is a real consequence when the initiative relies heavily on public funds of a short-term nature (cf. Perry, 2007) and is still struggling to find its niche. In this situation, members quickly become dissatisfied and withdraw their memberships, making critical mass more difficult to attain. Apart from existing member input and initiative pro-activeness, the attraction of critical mass can also be a matter of local specifics, which might have few businesses or other organizations of interest to the initiatives. Independent of the outcome, these aspects (activities, members, and driving forces) develop in tact with cluster initiative maturity and can be considered success factors, useful for evaluating the development process of cluster initiatives.

Relations between stakeholder expectations and cluster initiative capabilities is another area of interlinking. Some stakeholders are only interested in participating in the larger initiative-organized events, expecting them to include a broader audience than is possible for the initiative. Such over-ambitious expectations may also be directed at the content of technological events, anticipating exposure to the most innovative technologies, which initiatives might not have access to. Initiatives often choose to deal with these mismatches by reducing the level of ambition and applying a realistic perspective. The real-world experience of other stakeholders is usually a help. When stakeholders have unrealistic expectations, periodic communication can support progress and stakeholders may consider that slightly different activities and matters of organization are interesting.

A consideration of the challenges that can arise during assessment and management of initiatives should make it clear for leaders that a systematic way of applying success factors and criteria is needed. These may be influenced by changes to the initiatives and their surroundings, rendering previously crucial success factor less important and others more central.

Policy implications for cluster initiatives' management

Public policy has previously focused on a top-down approach, but due to the current concentration on multiple actors and their interactions, this approach has been shown to have weaknesses. As a consequence, the policy community and top-down steering became criticized (Diez, 2001; Mills et al, 2008; Swords, 2013) for failing to recognize the importance of soft influence and shift focus: from routine planning to evolutionary action, from reliance on standardized working methods to recognition of new actor needs and demands, from constraining behavior and affecting preferences of actors to inspiring and facilitating innovation, from a narrow understanding of economic success to a broader one that considers not only economic but also soft ingredients (e.g. social). It was a call for a reformation of traditional top-down ideas and a shift in focus to company strategies (a bottom-up approach).

The bottom-up approach began a power shift from top policymakers to the business community, who more easily perceived problems and could optimize solutions using

situational and just-in-time approaches. This shift was expected to balance government involvement and the good intentions behind program design by raising private-sector decision makers to the level of policy framers. This change, which is still ongoing, has created a platform for information asymmetry, common understanding, and action, all of which facilitate entrepreneurship in its various forms and place entrepreneurs and their associated networks in a position to govern the trajectory of future actions (cf. Gartner, 1988; Landström, 2007). One example of such governing of entrepreneurial outcomes can be seen industrial firms, facilitating or supportive organizations as different intermediary forms including cluster initiatives. These entities act as adjustment tools in the local context and as developers of unique policies from the standpoint of local institutional and cultural contexts, which was one of the major challenges of the top-down approach. Because the first results of this transformation of approach and shift of focus to cluster initiatives affected the planning, design, and execution of policy, this research question addresses implications of bottom-up approaches on research and practice, and provides some suggestions for dealing with residual top-down steering that might still influence cluster initiatives.

The results of this thesis underline that creation of cluster initiatives by government driven effort is short-term oriented and top-down steered, allowing little freedom of market-led actions (cf. Perry, 2007; Lindqvist et al, 2013). A better way of creating initiatives is through the efforts and willingness of agents-initiators such as business representatives and entrepreneurs. Unfortunately, the study reveals that in the eight countries investigated, such creations have rarely occurred without public assistance. Still, most of these no longer are governed through a pure top-down approach; rather, public involvement appears to be limited to infrastructure facilitation and promotions of various industry sectors while everyday governance falls to other initiative members. Such indirect public sector interference may be more or less influential, which is preferable, allowing space for other actors to lead development in cluster initiatives by emphasizing market imperfections and dynamics.

For cluster initiative management, such an indirect launching scheme has positive and negative consequences, which seem to go hand in hand. One positive consequence, financial flexibility in the initial and development phases, is accompanied by the negative one of a risk of reduction in funds from members. Another positive consequence, that policymakers are able to directly monitor and balance input from the actors holding the largest shares, is balanced by the negative consequence that all member representatives are not freely involved in the decision-making process. Such positive effects of indirect public sector assistance introduce opportunities for cluster initiatives to grow and develop while allowing them to support and justify their line of action. On a more general level, close involvement of public actors adds accountability, legitimacy, and wider knowledge – benefits on local and international arenas. Negative consequences concern the members of cluster initiatives, who lose motivation and contribute less to joint learning outcomes (cf. Malmberg & Maskell, 1997). Indirectly, these effects have an impact on cluster initiatives as well, in terms of reduced levels of trust and a distancing of members, which could become increasingly important as the initiative matures. As this thesis shows, maturity patterns are

related to the number and diversity of members involved; if the number is decreasing and membership becomes less diversified, maturation could turn to stagnation.

Cluster initiatives have two choices: they can draw up a set of priorities based on an examination of the current setting to deal with these consequences actively, or they can passively follow a pre-determined contingency plan. The active approach requires initiative leaders to consider regional settings, preconditions, and preferred objectives including organizational specifics like geographic scale, life cycle, and sector, before choosing a suitable plan of action. There is, however, no clear-cut blue print (cf. Fromhold-Eisebith & Eisebith, 2005). Checklists that address expected support and outcomes could be helpful for the entrepreneurs in the initiatives. Choosing bottom-up management would probably generate positive short-term effects, long-term support, and entrepreneurial driving force; top-down management, although characterized by shorter-term support, tends to have long-term development effects, especially from a macroeconomic view. Regional specifics and exploitation of potential opportunities to address weaknesses in regions can generate much support from regional actors and provide the initiatives with freedom of action, despite substantial support from the region. Life-cycle phase must also be considered when taking decisions on management approach, and the rule of thumb here is that top-down management guarantees success in the initial phases while a bottom-up approach is more advantageous in a longer perspective (cf. Martin & Sunley, 2011). Industrially, more mature industry sectors tend to be insulated from intensive entrepreneurship; thus, the choice of top-down management might be more appropriate, while bottom-up management might be preferable in the knowledge-intensive industries such as information technology and pharmaceutical branches, which are characterized by massive entrepreneurial activities.

Despite the management preference of the initiative, active top-down representatives would always fear leaving their charge to its own devices. This may have major effects on the ability of initiatives to take decisions into their own hands and become a part of a power game. Insecure behavior on the part of the initiatives can then affect entrepreneurial drive negatively, turning them into service deliverers and preventing them from fulfilling the triple mission. Actively choosing bottom-up management does not require a complete departure from top-down coaching; it could be useful in the right of veto. This thesis proposes a cluster initiative management model (see discussion of Question 3, Klofsten et al, 2015), which suggests tools for making management choices in practice and for choosing the most appropriate way to promote cluster initiatives among policymakers. For example, an 'Organization' factor from the model could offer tools such as identifying member needs, achieving member consensus on vision, and opening membership to businesses that vary widely in origin, size, and age. An 'Activities' factor could offer tools for promoting diversity in intermediary activities; this would appeal not only to existing members but also a broader audience and potentially attract a variety of new members. This factor in particular is a mode for achieving the 'Critical mass' factor. Additionally, heterogeneous membership would be an improved sounding board for top-down steering, promoting a better distribution of power in decision-making. Diverse activities would encourage identity building and extend market reputation, even in far-reaching geographic arenas (cf. Arthurs et al, 2009; Emmoth et al, 2015). And lastly, activities designed for

specific groups of members are a good basis for developing trust and reciprocity in collaborations. Trust in particular is known to be a prerequisite for positive interpretation of other partnering organizations' behavior (cf. Dirks & Ferrin, 2001). In other words, with trust, members might view top-down decision-making from a positive perspective: as a prerequisite for beneficial activities, which otherwise would probably not be delivered, or be delivered with less potential.

The passive approach is no perfect solution either. Initiatives can become an arena where the conflicting interests of different personalities and cultures meet, thus worsening overall input from conflicting members and dissipating the efforts of cluster initiatives from, for example, improving service quality and organizing innovative campaigns; instead, initiatives find themselves mediating conflicts, which is not their direct mission. If, however, initiatives manage to balance these contradictory powers to create synergies, they would gain advantages on both sides: public actors promoting the regional economy create a strong cluster initiative image, attracting investments, and private sector actors build entrepreneurial identity and legitimacy through market-led development strategies. Thus, macroeconomic development would be promoted by top-down management and co-operation with a decentralized power.

Involvement of both public and private actors in a balanced way would help manage the short-termism in financing that occurs in top-down steering. While financing may negatively affect the motivation of members to contribute to cluster initiatives, this does not last long. For example, such full-time financing is often provided for three or five years, from the time of the initiatives' start-up; in this phase, the initiative is undergoing intensive development, and potential members find its ideas new and captivating. Members would thus not be overly disturbed by the overwhelming decision-making power of the main financiers. Still, preserving members' motivation and willingness while accepting support in a top-down approach remains to be an important matter of survival for the initiatives throughout all their lifetime. This strong disconnect between membership and funding requires special attention from initiative leaders. One component seems to increase at the expense of the other, which could be weakening for the initiatives. This might be an outdated system setting, which does not correspond to the current situation, requiring effort to sustain development and avoid failure. The actions of these actors in tandem, supported by public policy, could direct the stream of entrepreneurial effort to other important organizational aspects, for example, improvements in and diversification of delivered activities.

The policy propositions discussed here do not affect practice only; they also affect research in this field concerning construction of a platform that includes inalienable criteria for understanding the nature and general patterns of cluster initiative operations. Moreover, these propositions reveal gaps, problems, and areas requiring improvements. Reconsideration of current policy, primarily by researchers with the capability of raising a scientific debate, would reinforce the need for the policy community to redesign their policies. In addition, central policy implications reinforce the "big five" management model by establishing crucial aspects of cluster initiative operations for further political and scientific discussion.

This discussion has striven to improve the visibility of cluster initiatives and recognition of the benefits they offer. This dissertation calls for such acknowledgment and sees it as a good approach for meeting regional challenges such as inadequate image and identity, unattractive entrepreneurial environments, too few collaborations, and lack of sufficient mechanisms for enabling creation and implementation of technologies and services. No improvements will occur without recognition and an understanding of the nature of cluster initiatives and their benefits. Some regions successfully managed these challenges, while in others, stagnation occurred. It seems that cluster initiatives might be one explanation for these differences, and for whether supporting mechanisms are adopted into the local context. Cluster initiatives might be entities able to correct the idea that “one-size fits all”.

5. CONCLUSIONS AND MAIN CONTRIBUTIONS

The aim of this thesis is to increase understanding of the organization of cluster initiatives and their intermediating role within regional spaces and to develop policy recommendations for the management and support of cluster initiatives. The four research questions have been addressed in this dissertation such as: 1) What types of actors are found in cluster initiatives and how do they interrelate? 2) How are cluster initiatives organized and how do they intermediate? 3) What types of success factors are identified behind the performance of cluster initiatives? 4) What policy implications can be formulated for research and practice with regard to cluster initiatives management? This chapter presents answers to these research questions and draws conclusions on a general level. It also discusses the main contributions of this thesis to theory and practical development and suggests some ideas for future research.

Conclusions

Searching for new opportunities and development, businesses have adopted new organizational processes that depend a great deal on supporting organizations (cf. Emmoth et al, 2015). The cluster initiative is an example of such a supporting organization that helps businesses advance their capabilities by increasing their networking channels and information flow and which this dissertation has explored (Sölvell et al, 2003). Similarly, government agents and academia turn to cluster initiatives for assistance while searching for ways to improve their competitive edge and their collaborations with other actors. These Triple Helix actors (Etzkowitz & Leydesdorff, 2000) are reflected in the first conclusion of this dissertation, which highlights that cluster initiatives operate in a four-faceted constellation of actors originating in various domains. One of these actors is always the cluster initiative itself while the other three are key players, support groups, and target groups, which consist of one actor or a combination of actors from the Triple Helix model.

Only an actor's mission and agenda (e.g., commercial, political, charitable) restricts its involvement in a cluster initiative; otherwise, the number of involved actors is unlimited, and in this sense, rather open and inviting. Peripheral actors, for example, from other sectors and locations, might also become a matter of interest when fresh members, ideas, and knowledge are needed. Cluster initiatives strive to enable numerous active linkages – critical mass – with these actors, providing benefits for all involved (Hallencrutz & Lundequist 2003; Klofsten et al, 2015). These linkages allow the initiatives to participate in many interaction processes simultaneously but at the same time require them to balance between contradictory values and rules. This process creates a buffer against shocks and economic pressures (Kiese & Hundt, 2014). Without these linkages, resources and specialized skills supplied by other members into the initiatives may be lost, which would reduce their contribution and worsen own and members' development as well as delay the growth of successful regions (Asheim & Coenen et al, 2005). One of the reasons of losing such linkages can be overdependence of cluster initiatives on one or several key members, which is a negative side in work in these organizations (cf. Vicente, 2014). It is hardly manageable due to financial burden of these initiatives to the controlling party; however, the efforts of pro-active entrepreneurs visualizing such a happening might rescue the situation.

The relationships between the actors in a cluster initiative allow them to contribute by supplying services to the initiative, for example, by providing financial support, attracting new investments, and executing decision-making power (individually and collectively) - all driven by a desire to shape the performance of cluster initiatives (cf. Ketels & Memedovic, 2008). Relations among the actors might be best characterized as “unruly”: it is often hard to define who is who and what role has been assigned to them in the development process (cf. Mattsson, 2007; Lindqvist et al, 2013). They often fulfill polar roles simultaneously, for example, as financiers and as recipients of the services of cluster initiatives. Life in a cluster initiative is dynamic, and throughout its life, the degree of involvement and roles the actors play will change (cf. Klerxs & Leeuwis, 2008). All members are autonomous bodies; they are free to decide their degree of involvement. The unruliness of cluster initiatives and the dynamic changes in their membership are what make policy design so difficult.

All cluster initiative members and employees form networks, an action-constituted entity, that initiatives organize and fertilize by exercising an intermediary role. This is the second conclusion generated in this thesis. The entrepreneurial spirit and driving force of the cluster initiative individuals, and of the organization members, enable the capacity of this body and its governance. (cf. Lundequist & Power, 2002; Sorensen & Torfing, 2005). Moreover, the networks, seeded in the nature of the initiatives, enable far-reaching interactions and a wide diversification of activities. The interactions across the various locations, actors, and relationships illustrate the fluidity of cluster initiatives, an important intermediary characteristic that cluster initiatives have successfully domesticated (Rosenfeld, 2005; Moss et al, 2009). The intermediary work is rather an invisible process of linking different actors, due to operating outside formal organizational frames. This behind-scenes orchestration makes these entities effective in achieving their own and members’ objectives. Despite these positive outcomes of fluidity, policymakers might consider it a limitation as they struggle to find appropriate management and assessment methods (cf. Martin & Sunley, 2011).

The intermediary work is realized through their activities, which is along with critical mass of actors, the other natural organizational feature of cluster initiatives. These activities secure the survival of the initiative and communicate to the surroundings that the intermediary in a face of a cluster initiative is alive and well functioning (cf. Howells, 2006; Etzkowitz & Ranga, 2011). The portfolio of activities is rather broad and includes both general activities carried out by traditional intermediaries as well as activities that reflect the specialty of the cluster initiative. The breadth and generality of activities show that cluster initiatives are able, in a chameleon-like fashion, to dynamically respond to member needs, simultaneously offering services of several intermediaries. Specialized activities show that these evolving organizations are able to capture a broader context than that of a simple intermediary (cf. Fromhold-Eisebith & Eisebith, 2005). So, cluster initiatives produce activities on demand, but not only; they also constitute connecting and coordinating activities driven from the center of the initiatives, which aim to support their own as well as each member’s strength. This mode of operations is an especially reflective feature that differentiates cluster initiatives from clusters, which are driven by many independent decisions (cf. Mills et al, 2008; Hanusch et al, 2009). The process of coordinating

entrepreneurs and decision-makers is similar to the process of connecting members; arising from the center of the initiative, the coordination process is what makes initiatives so adaptive and pliable to policy and membership dynamics. As an example, the joint coordination efforts of cluster initiatives and their members allow the changing needs of all involved to be detected and an emerging response created. This process successfully manages challenges such as conflicts of interests and over-dominant members; cluster initiatives make use of a balancing technique whereby they smoothly switch roles from one of organizer to that of servant, or perform both at the same time in relation to certain members. In case if this balancing technique fails there is a danger, which is known in this context as overspecialization – the other dark side of the cluster initiatives (cf. Bathelt et al, 2004). It can worsen the whole well being of the initiative as well as their members – the backbone of this can be seen an adaptive culture of these organizations which may be drifted by certain group of interested party led by egoistic (opportunistic) purposes.

Cluster initiatives usually operate in the form of temporary projects and develop dynamically over time under the influence of, for example, the support and demands of members, and market and policy changes. Establishing a framework for long-term survival is usually a challenging path for cluster initiatives (cf. Perry, 2007). On the one hand, while maturing, they teach their members and develop the capability to satisfy members' needs; but on the other hand, long-term survival is linked with potential shortcomings in financial support and lower innovativity in activities (cf. Hallencreutz & Lundequist, 2003). This thesis further investigated maturity patterns and found that cluster initiatives, which succeed in obtaining financial independence from their stakeholders, have the potential to become a legitimate and long-lasting organization. This emphasizes the importance of keeping intermediary activities diversified and innovative. Diversification and innovation make it possible to involve larger critical masses of members as the organization matures. This process depends largely on the willingness and eagerness of the entrepreneurs who lead the initiatives to maintain their ventures (cf. Klofsten & Jones-Evans, 1996; Shane & Venkataraman, 2000; Landström, 2007). Thus, these aspects that co-develop during maturation of the cluster initiative could be called their success factors, and used to assess its development process. Policymakers who facilitate cluster initiatives' venturing expect cluster initiatives to be able to work in both modes: with support from financiers as well as without; thus, assuring their independent survival. Such independent examples can be viewed as cluster initiatives that are long-lasting and go through traditional organizational life-cycle phases from start to maturity, possibly achieving revitalization; however, the number of self-sustaining benchmark examples is not large. Despite this, short-term initiatives occasionally deliver benefits to their clusters and regions, which illustrates how initiatives that close after a short term of operation are not always failures.

Both of the above-mentioned conclusions pinpointed that the fluidity and unruliness of cluster initiatives are the primary challenges in policy design, along with their assessment and management (cf. Aziz & Norhashim, 2008; Ebbeking & Lagendijk, 2013). In view of these challenges, this dissertation proposes that cluster initiatives can be assessed and managed using five qualitative factors that together depict a holistic picture of their functioning. These are idea, organization, and activities (depict operations), driving force and commitment (depict core actors), and critical mass (depict member diversity). The previous sections in this work provides even suggestions about the most suitable valuation

and its interpretation for each of these factors. These factors are adapted for the specifics of cluster initiatives and should be used in combination to adequately assess and manage their development. Some of the model's factors can be influenced before actual start-up of the initiative; for example, the choice of the entrepreneurs and employees representing the driving forces. This choice, however, requires further maintenance of the team by different means or even replacement of those who leave with comparable candidates. Other factors, though, can only be influenced after the actual start of the cluster initiative, through the activities the initiative provides and continues throughout its lifetime, such as attracting a critical mass of members. It is difficult, however, to modify an operational factor like idea and retain the original frame: a new idea is often a platform for a new venture and relevant for other actors. Several of the techniques proposed in this dissertation enable this maintenance work and focus on member-initiative dialog, in order to promote a realistic perspective and reduce over-ambitiousness.

Lastly, this thesis acknowledges the work of cluster initiatives as intermediary organizations, but calls for the need to reframe policy so that it allows diversification among the actors and interaction mechanisms among the initiatives. Setting a long-term perspective and bottom-up approach as standards in policy design for cluster initiatives may be the best way to achieve these goals. Such standards are one way of stressing the importance of supporting free choice of business decisions, reducing the burden on public funding, and lowering requirements for the current complex financial reporting, all of which would reduce the inadequate use of resources (Tödtling & Trippl, 2005; Klerkx & Leeuwis, 2008). So, instead of being the left hand of the public sector, cluster initiatives should become the right hand of businesses. The potential negative consequences of such a shift include too narrow a focus on local arenas, overly strict criteria for membership, and being cast in the role of a servant for several large businesses. These can, however, be looked upon as manageable consequences, and they might be worthwhile for the sake of achieving longer-term support from businesses, which is a prerequisite for cluster initiative survival. Strictly speaking, the foundation for survival and longevity was laid when top-down steering was removed from the priority agenda and reinforced by the motivated members given some autonomy in decision-making.

Main contributions of this dissertation

This thesis strives to make theoretical and practical contributions to current knowledge and understanding in the field on relationships between cluster initiatives, clusters, and intermediary organizations; on management of cluster initiatives; and on the influence of cluster initiatives on regional development. Going back to beginning of this thesis summary, and remembering the conceptual, theoretical, and empirical gaps underlying this research, I wish to say that my ambitious aim to fulfill these gaps, although not always completely successful, was successful at least in part.

The first contribution of this thesis is its enrichment of the literature through insights into the typology, roles, and relationships among the actors comprising supporting organizations, and in particular, cluster initiatives. This contribution meets theoretical in particular, but also a conceptual gap in the knowledge of cluster initiatives. The first paper in this

thesis proposes a model that defines the types of actors, their roles, and their relationships in cluster initiatives. Most existing studies focus on actor composition, for example, in traditional firms and networks, and strive to generate generally applicable models (Forsman & Solitander, 2003; Arthurs et al, 2009; Aziz & Norhashim, 2009). These models could only be partially adapted to the context of cluster initiatives, not fully, because of initiatives' non-traditional way of working and functioning outside of organizational boundaries (Rosenfeld, 2003). This thesis goes further by lifting out and examining the specifics of cluster initiative actors, who are also relevant for other intermediary organizations, both traditional as well as hybrid, and represent several intermediaries simultaneously. Dividing actors into groups using a Triple Helix model approach – industry, academia, and government – and combining these with the various tasks they perform and their relationships (see also Paper 3) highlights the value and contribution of cluster initiatives to each actor. Knowing how each member contributes might promote awareness in the surroundings of the benefits of being a cluster initiative member and attract new members to the initiatives, thus securing their longevity. The papers in this thesis emphasize that a clear understanding of actor input would facilitate joint achievements (cf. Becattini et al, 1992), which can have a positive impact on a larger macroeconomic level, such as moving regions with their constituents into economic and societal value (cf. Audretsch, 2013).

At the same time, using various research methodologies, this dissertation complements existing research by defining the role and relationships of involved actors, and by exploring the dynamics of the process of role switching and the reasons behind it. This responds to a general call from Brown et al (2008) and Royer (2009), among others, to emphasize the nature and roles of actors and their relationships in cluster research in general (cf. Mills et al, 2008; Ingstrup, 2010). This particular part touching upon methodological but also empirical choices is aimed to tackle the empirical gap in the knowledge of cluster initiatives.

The second contribution of this thesis is its integration of theoretical lenses from studies on clusters and intermediaries, and also entrepreneurship, networking, business support, and regional development (Cooke, 2002; Gartner, 1988; Provan & Kenis, 2006). This integration differentiated between concepts such as cluster and cluster initiatives, with the aim of reducing misconceptions in terminology use (cf. Fromhold-Eisebith & Eisebith, 2005; Hanusch et al, 2009; Brown & Mason, 2014) and fills foremost the theoretical gap in understanding of these organizations. In addition, this thesis introduces cluster initiatives as intermediaries, clarifies their similarities as well as where the initiatives are superior, and combines other features. This would contribute into fulfillment of the conceptual gap in the knowledge of the initiatives.

The third contribution of this dissertation to the literature is – a model for assessing and managing cluster initiatives. This model (see Paper 4) complements existing research (Andersson et al, 2004; Sölvell et al, 2003; Mills et al, 2008; Arthurs et al, 2009) by adopting assessment indicators from small firm theory and covers the theoretical gap in the knowledge of cluster initiatives. The model suggested in this thesis and its use of indicators provide valuable input into the main obstacles and problems confronting initiatives. These

indicators represent largely overlooked qualitative factors, for example, entrepreneurial force, commitment, and clarity of idea (soft values), and are assessment techniques that, in the eyes of this thesis, would be good complements to the quantitative ones (hard values) that are largely in focus today. Treating each factor on its own, this thesis underlines which challenges can be met in practice and which in policy design, and identifies the factors most relevant to cluster initiative survival. The development of these soft indicators is a result of the joint work of researchers, cluster initiatives, and policymakers, and the platform these indicators create, credibly, is accurate and up to date.

The primary aim of the model was to be policy relevant – to assist policymakers by recommending a set of success factors that suggest an approach for reporting operational results and which can be a decision-making tool for improving cluster initiative support. In addition, cluster initiatives can use the model during strategic planning, where stakeholders are an important party to involve. However, leaders, employees, and others unrelated to cluster initiatives actors can use this methodology to analyze cluster initiatives. Relying on the factors in the model, it is possible to simply observe the initiatives and create a consistent picture of the cluster initiative's functioning as a whole or of its separate constituents.

This thesis also invites a discussion on potential modifications of these factors, while dynamic changes throughout the organization show, for example, how far initiatives may transform from their initial idea. Thus, this management model can serve as a guideline for creating an “ideal” cluster initiative and as a practical tool for avoiding the trial-and-error methods that cluster initiative leaders sometimes use (Enright, 2003). Use of this model could also go hand-in-hand with the current muddling-through process of policy design and isolate those aspects needing maximal attention while adapting future policy design to more effectively support entrepreneurship and regional growth. Therefore, this contribution can also be seen as a support for policy improvement and deal an existing policy gap in the knowledge.

The last contribution of this dissertation, which has reinforced previously discussed contributions in the face of an assessment model, is the discovery of value in elaborating on maturity processes in cluster initiatives (addressing the theoretical and policy gaps). Instead of focusing on different phases of the maturation process as many other studies have done (Audretsch & Feldman, 1996; Malmberg & Maskell, 2007) – which have been criticized for being imprecise and vague (Martin & Sunley, 2011) – this work provides another approach for observing maturity patterns that is based on success factors. It shows how the development of critical success factors should proceed when the initiative possesses the potential to grow and, in contrast, when these factors signal a challenging situation for the initiative. Simple observation of, for example, activities and members can provide a good indication of the current and future potential for development of the initiative. Thus, policy intervention and managerial change should occur based on an assessment of important factors in cluster initiatives and an understanding of the maturation process in the particular initiative. This last becomes particularly important when considering how short lasting cluster initiatives can be and how risky it could be if they were not properly assessed.

Future research

This dissertation, while dealing with the complexity of actors' roles and relationships, raises the issue of unruliness and dynamic adaptability (cf. Lagendijk & Cornford 2000). Clearly, it is a topic that should be studied more deeply to find more profound explanations, perhaps by using different methods such as longitudinal studies, but also including other theories on organizational, network and innovation systems. However, the chosen methodological approach in this dissertation – a mixture of qualitative and quantitative methods – was found to be very beneficial (Sieber, 1973; Tashakkori & Teddlie, 1998) and is probably the method of choice for use in a longitudinal setting. Content-wise, particular attention in the study of relationships should be given to dominant actors and cluster initiatives (cf. Aziz & Norhashim, 2008). Management of their relations seems to be challenging for initiative leaders. Being aware of potential ways to deal with such challenges could facilitate the process of decision-making and foster progress. This dissertation has provided some suggestions for dealing with the dominancy problem – for example, admitting other influential members and increasing the autonomy of the initiative by finding other sources of support – however, a more profound approach that would assist leaders throughout the lifetime of the initiative, rather than an itemized list of suggestions, should be proposed. To achieve this, other studies that focus on the relationships between these two actors should be carried out.

A second proposition for future research also focuses on the relationships and roles of actors, but instead of from a cluster initiatives perspective, it could be beneficial to investigate the perspective of cluster initiative members – whether they experience similar dissatisfaction with the messiness of the relationships, as do cluster initiatives. Moreover, members probably have their own viewpoints on assessment indicators and initiative management – is there anything to be learned from the evaluation techniques that members use? On the other hand, the proposed assessment model (Klofsten et al, 2015) may be valuable in using among members. So, the next step of the research is still linked with the actors' content and relationships, but cluster initiative stakeholders are special agents, which might further assist in verification of existing findings, in their enrichment, and in clarification.

Another important block relevant for future research is related to policy improvements. This dissertation raises several weaknesses in current policy and provides recommendations for their improvement. However, this is seen rather as a short-term solution; a more profound approach with both operational and strategic recommendations as well as new ways to smoothly facilitate venturing, rather than direct intervention through top-down methods, should be found. For this, policymakers must be convinced that their expectations are overambitious, that the working policy proposed in this thesis has merit, and above all, that listening to voices rising from the bottom in a bottom-up approach is vastly superior to the short-term echoes emanating from the market. The main subjects in this type of research would be policymakers together with cluster initiatives. Experimental approaches that use stimulation would be good for this type of research; for example, creating predetermined political settings, and then testing them in practice before their

actual application to observe how cluster initiatives accept different policies and what effects might occur.

And lastly, because this study focused on eight European countries that together were used to generate an overall picture of cluster initiatives' functioning, the next step could be to study each individual country for the purpose of making cross-comparisons. The same could be done with sectors to make cross-sectorial comparisons. The results of such studies, which could be carried out using this thesis, would be most useful for the individual countries, for further research and consultancy purposes. One such research theme could be to further investigate how management of cluster initiative' stakeholders changed after their connection to cluster initiatives and what effects that had on the stakeholders' performance.

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7. APPENDIX

Database of cluster initiatives

Name of Cluster Initiative:	Address (city/country):	Year of start
1. Agro Food Park	Skejby, Denmark	2009
2. Bio-people	Copenhagen, Denmark	2009
3. Brains Business ICT Norcom	North Denmark Region	2008
4. Cluster Biofuels Denmark	Kalundborg, Denmark	2008
5. Copenhagen Cleantech Cluster	Copenhagen, Denmark	2009
6. Danish Cooling Cluster	Sønderborg, Denmark	2006
7. Danish Maritime Cluster	Copenhagen, Denmark	2006
8. Innovation Network Alu-Cluster	Kolding, Denmark	1999
9. Innovation Network UNIC- National Partnership	Odense, Denmark	2010
10. Lean Energy Cluster	Sønderborg, Denmark	2010
11. Medicho-Innovation	Copenhagen, Denmark	2010
12. Medicon Valley Alliance	Copenhagen, Denmark	1997
13. Robo-cluster	Odense Denmark	2002
14. Öresund food	Denmark	1999
15. Baltic net	Finland	2004
16. Cluster programs, VANTAA innovation association	Vantaa, Finland	2009
17. Culminatum Innovation Oy Ltd	Espoo, Finland	1995
18. Dynamic Bio energy	Central Finland	2007
19. Edu-Cluster Finland Ltd.	Jyväskylä, Finland	2006
20. Food Development Cluster	Jokioinen/Finland	2007
21. Grain Cluster in Lahti Region	Lahti, Finland	2003
22. Jyväskylä Innovation Ltd	Jyväskylä, Finland	2006
23. Living business cluster	Helsinki, Finland	2007
24. Photonique and Carelian	Tampere, Finland	2011
25. South Western Cluster of Finland	Turku/Finland	1994
26. Biotech-North	Tromsø, Norway	2010
27. IKT Greenland	Klosterøya - Skien, Norway	2002
28. Innovation Centre Hedmark	Norway	2012
29. Konkraft	Oslo, Norway	1999
30. NCE Aquaculture	Bodø, Norway	2007
31. NCE Culinology	Stavanger, Norway	2009
32. NCE Instrumentation	Trondheim, Norway	2006
33. NCE Subsea	Bergen, Norway	2006
34. NODE to NCE	Kristiansand, Norway	2005
35. Norwegian Centre of Expertise	Ålesund, Norway	2008
36. NTNU Technology transfer TTO	Trondheim, Norway	2003
37. Oslo Cancer Cluster	Oslo, Norway	2010
38. T.I.M.E	Trondheim, Norway	1989
39. Wind cluster Mid Norway	Verdal, Norway	2010
40. Ada association design and advertisement	Gothenburg, Sweden	2005

41. Bio Fuel region	Umeå, Sweden	2003
42. Cluster55 (Öresund IT)	Sweden, Denmark	1999
43. Bearing Consulting LTD	Sweden	1995
44. Fiber Optic Valley	Sweden	2001
45. FinansKompetensCentrum	Gotenborg, Sweden	2001
46. IGIS	Lyckelse, Sweden	2003
47. Internet-bay	Luleå, Sweden	1999
48. Kista Science City	Kista, Sweden	2000
49. Ljustal	Gävleborg, Sweden	1990
50. Microwave-road	Gothenburg, Sweden	2000
51. New Tools for Health	Linköping, Sweden	2005
52. Paper Province	Sweden	1999
53. Pressroom bio-refinery initiative	Örnsköldsvik, Sweden	2002
54. Printed Electronic Arena	Norrköping, Sweden	2008
55. Printing arena	Norrköping, Sweden	2010
56. RockCity	Hulsfred, Sweden	1996
57. SMIL	Linköping, Sweden	1984
58. Steel and Engineering initiative	Kristinehamn, Sweden	2006
59. Sustainable Småland	Växjö, Sweden	2010
60. Telecom City	Campus Gräsvik, Sweden	1992
61. TIME Stockholm	Stockholm, Sweden	1998
62. Triple Steel-ix	Börlänge, Sweden	2004
63. Tunga fordon centre	Växjö, Sweden	2006
64. UppsalaBio	Uppsala, Sweden	2003
65. Vreta cluster	Sweden	2004
66. Öresund logistics, science region	Skåne, Sweden and Denmark	2003
67. ARESA association for health	Wallonia, Belgium	2003
68. Bio-win	Brussels, Belgium	2006
69. Cap 2020	Wallonia, Belgium	2009
70. Council of European bio regions	Brussels, Belgium	2004
71. DSP Valley - Digital Signal Processing Valley	Belgium	1996
72. Eco construction	Namur, Belgium	2001
73. The Flanders Bio	Gent, Belgium	2004
74. Florist Organization FLORIN	Holland, Belgium	1956
75. Food Cluster Initiative	Gung, Belgium	2008
75. Ghent Bio-Energy Valley	Ghent, Belgium	2005
76. Infopole Cluster TIC	Namur, Belgium	2005
77. Techno Pol / Agency Bruxelloise pour Enterprise	Brussels, Belgium	1999
78. Pharma.be	Belgium	2008
79. Photonique	Belgium	2008
80. Polemechatech	Namur, Belgium	2004
81. Technologies for Image, Sound and Tex	Namur, Belgium	2007
82. T:I:M:E:	Belgium	2004
83. Twist	Liege / Belgium	2007
84. Tweed	Liege, Belgium	2008
85. The Walloon Telecommunications Agency	Wallonia, Belgium	2009

86. Cluster Dechets Solides (VAL+)	Belgium	2004
87. Sky-WinAerospace cluster initiative	Belgium	2006
88. Aachen Centre of Competence for Medical Technology	Aachen, Germany	2003
89. Alliance Fibre-Based Materials BW	Stuttgart, Germany	2010
90. Atrial Fibrillation Competence Network	Germany	2003
91. Automotive Saarland	Saarbrücken, Germany	2003
92. Aviation Cluster initiative	Hamburg, Germany	2002
93. Baden Württemberg Connected	Stuttgart, Germany	1997
94. BalticNet-PlasmaTec	Greifswald, Germany	2006
95. Bavarian "Cluster optical technologies / Photonics"	Bavaria, Germany	2000
96. BICCnet	München, Germany	2006
97. Brandenburg Nutrition Network	Potsdam, Germany	2007
98. CFK-Valley	Hamburg, Germany	1990
99. Cluster Medical Technology AKM	Düsseldorf, Germany	2011
100. cc-NanoBioNet e. V.	Saarbrücken, Germany	2002
101. Cluster Nanotechnology	Würzburg, Germany	2006
102. German Center for Satellit Communication (DeSK)	Germany	2011
103. ITV innovation alliance with leading Institute of Textile Technology and Process Engineering	Germany	1998
104. Kompetenznetzwerk dezentrale Energietechnologien(deENet)	Kassel, Germany	2003
105. Logistic ruhr	Mülheim de Ruhr, Germany	2008
106. The Visual Computing Baden-Württemberg	Stuttgart, Germany	2005
107. Packaging Valley Germany	Germany	2007
108. Bioenergy cluster	Enschede, The Netherlands	2007
109. Business Cluster Semiconductors East Netherlands	Arnhem, The Netherlands	2002
110. Dommel Valley Group	The Netherlands	1998
111. European Grid Infrastructure	Amsterdam, The Netherlands	2010
112. Flora Holland	Rotterdam, The Netherlands	1911
113. Food Valley	The Netherlands	2004
114. Immuno Valley	Utrecht, The Netherlands	2008
115. Inno-Food	Almelo, the Netherlands	1998
116. Life Sciences Health	AK Den Haag, The Netherlands	2009
117. Netherlands Consortium for Healthy Ageing	Leiden, The Netherlands	2008
118. Netherlands Genomics Initiative (NGI)	The Netherlands	2002
119. NIZO, Food Valley	The Netherlands	1948
120. Point-One	Eindhoven, The Netherlands	2006
121. Chemicals Northwest	Cheshire, UK	2004
122. Creative England	Manchester, UK	2011
123. The East of England Energy Group (EEEGR)	Great Yarmouth, UK	2001
124. Enviro-link	Warrington, UK	2000
121. Enviro-Cluster Peterborough	Peterborough, UK	2002
126. Medilink East (One nucleus)	Cambridge and London, UK	2010

127. The Multidisciplinary Assessment of Technology Centre for Healthcare (MATCH)	United Kingdom	2003
128. Midlands Aerospace Alliance	Coventry, UK	2003
129. Nw-tex-net	Bolton, UK	2003
130. Oxford and South East England Bio Cluster	OxfordShire, UK	1999
131. The Rail Alliance	United Kingdom	2007
132. Scotland Food & Drink	Edinburgh, UK	2007
133. Scottish Forest & Timber Technologies	Scotland, UK	2011
134. South East England Bio-Cluster	Oxford shire, UK	1999
135. International Centre of excellence in Telecare (ICE-T)	South East UK	1998
136. The UK Centre for Economic and Environmental Development (UKCEED)	Peterborough, UK	1984

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Papers

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