Work-in-progress – please do not quote and publish

The challenge of facilitating clusters: barriers and drivers originating from different logics between industry, academia and government

Mads Bruun Ingstrup
Department of Entrepreneurship and Relationship Management
University of Southern Denmark
mbi@sam.sdu.dk

Leena Aarikka-Stenroos
Laboratory of Industrial and Information Management
Center for Innovation and Technology Research
Tampere University of Technology
leena.aarikka-stenroos@tut.fi

Nillo Halonen
Laboratory of Mechanical Engineering and Industrial Systems
Tampere University of Technology
nillo.halonen@tut.fi

ABSTRACT

Cluster facilitators aim to foster and support collaboration and knowledge-sharing amongst cluster actors from industry, academia and government. However, this task is difficult since the institutional logics of these actors differ and are sometimes conflicting. To address this challenge and offer a way forward, this paper identifies and classifies the barriers and drivers that arise from this diversity of logics and shape the role of cluster facilitators. The theoretical background of the paper is based on insights into cluster facilitation and institutional logics, and the empirical context centres on a circular economy cluster from Finland. In line with this, the paper concludes that cluster facilitators must deal with four major types of barriers and drivers: 1) barriers and drivers originating from one actor, 2) barriers and drivers that concern one actor group, 3) barriers and drivers arising from interaction between two actor groups, and finally 4) barriers and drivers relating to all actor groups in the same cluster context.

Keywords: Cluster facilitation, cluster management, institutional logics.

INTRODUCTION

Regional clusters, as defined by Porter (2000), are geographical concentrations of interlinked actors from industry, academia and government that compete and collaborate. This type of geographical agglomeration is traditionally portrayed as self-organising, but due to the implementation of system-oriented innovation polices throughout Europe seeking to interfere in regional learning and networking (Fosse and Normann, 2017), this is no longer always the case. As part of pushing forward this agenda of regional learning and networking, cluster facilitators have become key in promoting collaboration and knowledge-sharing that can ultimately lead to innovation processes in clusters. Thus, the importance of cluster facilitation in such innovation processes is strongly emphasised as they are becoming increasingly open and spread out over time (Coombs et al., 2003) and are involving a growing number of actors and knowledge sources (Van Lente et al., 2003), which calls for a facilitator to keep track of the fragmented interaction and to inspire actors to engage in knowledge processes (Bocquet and Mothe, 2015).

As part of fostering and supporting collaboration and knowledge-sharing in clusters, cluster facilitators help cluster actors from industry, academia and government overcome structural holes (Burt, 1992) and benefit from the opportunities arising from the strength of weak ties (Granovetter, 1973). More specifically, cluster facilitation is described as looking for opportunities through building or reinforcing activity links and resource ties to cluster actors to generate social returns (Fritsch and Kauffeld-Monz, 2010), increase the density of clusters (Huggins, 2001), promote capacity building (Klerkx and Leeuwis, 2008) or encourage technology transfer and commercialisation of ideas (Inkinen and Suorsa, 2010). These and similar characteristics explain what cluster facilitators do but not how they do it, including the challenges they meet in their work when facilitating cluster actors from industry, academia and government. This lack of conceptual unfolding adds to the existing criticism regarding overly general conceptualisations in cluster facilitation literature (Fromhold-Eisebith and Eisebith, 2005; Sydow et al., 2011).

The purpose of this paper is to identify and classify the barriers and drivers that arise when facilitating cluster actors from across industry, academia and government. Since these actors follow different logics (Baraldi and Strömsten, 2009; Öberg and Shih, 2014), which present various challenges for cluster facilitators to handle, it helps add nuance to the cluster facilitation literature to stress that there is no one-size-fits-all approach. To meet this purpose, the theoretical background of the paper is composed of literature on cluster facilitation (Fosse and Normann, 2017; Ingstrup and Damgaard, 2013) and on institutional logics (Thornton and Ocasio, 2008; Öberg and Shih, 2014). Moreover, the empirical context in which this theoretical background is used is a circular economy cluster from Finland.

Relying on the theoretical background and empirical context, this paper contributes to the existing literature on cluster facilitation by highlighting how logics enable as well as inhibit the work of cluster facilitators. The empirical evidence shows four types of barriers and drivers that cluster facilitators face when fostering collaboration and knowledge-sharing amongst cluster actors: 1) barriers and drivers originating from one actor, 2) barriers and drivers that concern one actor group, 3) barriers and drivers arising from interaction between two actor groups, and finally 4) barriers and drivers relating to all actor groups in the same cluster context. This conceptualisation is useful as a tool for cluster facilitators. They can use it to better understand their complex profession as well as get inspiration on how to overcome barriers and make use of drivers when promoting collaboration and knowledge-sharing amongst cluster actors.

To arrive at these findings, the paper is organised as follows. In Section 2, theories on cluster facilitation and institutional logics are outlined with the aim of developing a conceptual framework that can be used in the empirical investigation later in the paper. In Section 3, the applied research design and data-generating techniques are explained, and in the succeeding section, Section 4, the case study is presented. Following this, Section 5 discusses, draws conclusions from and reflects on the case study findings.

THEORY AND CONCEPTS

Cluster facilitation

Research on cluster facilitation is relatively new. Its point of departure is the statement by Powell (1990) that network modes of organising economic activity differ in several characteristics compared to other modes of organising. This calls for diverse approaches to governance. The theoretical stance on which this area of research builds emerged from disciplines such as network management and governance (Klijn et al., 2010; Dhanaraj and Parkhe, 2006; Powell, 1990), intermediation (Batterink et al., 2010; Howells, 2006; Winch and Courtney, 2007) and brokering (Hanna and Walsh, 2002; Provan and Human, 1999; Snow et al., 1992). Following this eclectic theoretical background, different research perspectives on cluster facilitation mushroomed, including a policy perspective and an actor perspective (Ingstrup, 2013). The policy perspective focuses on how cluster policy frameworks and initiatives seek to facilitate the development of clusters and arising cluster externalities (Borrás and Tsagdis, 2008; Nauwelaers, 2001) and the actor perspective addresses how several types of actors execute facilitation in clusters, including their attributes and activities (Ingstrup and Damgaard, 2013; Molina-Morales, 2005; Zagorsek et al., 2008).

Subscribing to the actor perspective, contributions have to date identified several types of actors that fulfil the role of cluster facilitator, for instance individuals, firms, government agencies and knowledge institutions (Ingstrup, 2013). Depending on the theoretical and empirical context in which these actors are portrayed, they are named differently, for example: intermediaries (Howells, 2006), regional institutions (McEvily and Zaheer, 1999), deal makers (Feldman and Zoller, 2012), cluster leaders (Sydow et al., 2011), clusterpreneurs (Christensen and Stoerring, 2012), cluster animators (Gagné et al., 2010), cluster drivers (Hallencreutz and Lundequist, 2003), cluster managers (Coletti, 2010) and supporting organisations (Molina-Morales and Martínez-Cháfer, 2016). Although the name differs, cluster facilitators' aim is to build trust that can foster collaboration and knowledge-sharing and that can fight distrust and competition (Mesquita, 2007). As part of this aim, cluster facilitators seek to minimise the social holes in clusters by connecting actors with complementary interests to each other in order to strengthen the weak ties of clusters and increase the levels of interdependence within them (Aldrich and Zimmer, 1986).

To foster and support collaboration and knowledge-sharing in clusters, several researchers have outlined what cluster facilitators should do. McEvily and Zaheer (2004) call for cluster facilitators to identify and develop shared interests and expectations amongst the participating cluster actors, Coletti (2010) highlights that they should find and attract key actors to the cluster and support knowledge dissemination, and Molina-Morales (2005) stresses that they should organise training activities, run projects, provide support services and build relationships between internal and external cluster actors and brand clusters. To accomplish these activities, Zagorsek et al. (2008) highlight eleven attributes that cluster facilitators should excel in. They

should be forward-looking, have business understanding, have well-developed managerial skills, be credible, be communicators, be integrators, be results-oriented, be neutral, be entrepreneurial, be external spanners and, finally, they should be innovative. Indeed, for cluster facilitators to impact cluster actors and their interaction as much as possible through these different activities and attributes, Giest (2015) recommends that they position themselves centrally in clusters, so they can link cluster actors as well as reach out to actors outside clusters. In this process, it is likewise important that cluster actors stay close to the facilitators and their accumulated experience in observing and helping others. This will help lower the search costs of cluster actors (McEvily and Zaheer, 1999) as well as improve the interconnectedness in clusters (Molina-Morales and Martínez-Cháfer, 2016).

However, recent studies challenge this general picture where all cluster facilitators are supposed to perform the same tasks and fulfil the same roles. Instead, they advocate for a contingent approach towards cluster facilitation (see e.g. Aslesen and Pettersen, 2017; Ingstrup and Damgaard, 2013). The idea behind this approach is that clusters are organised structurally differently and are embedded in dissimilar contexts, which then demand that cluster facilitation is adapted accordingly. Following this, Sydow et al. (2011) explain that cluster facilitation is significantly influenced by the historical, political, cultural and technological milieu of the cluster. In continuation hereof, Fosse and Normann (2017) show how the use of four facilitation strategies (structural, relational, cognitive and political) varies along the life cycle of clusters, with the relational and cognitive strategies being important during the entire development process, and Ingstrup and Damgaard (2013) demonstrate how the role, focus, competencies and tasks of cluster facilitators change during the cluster life cycle. They mention that in potential clusters, cluster facilitation aims to build trust, create social bonds and strengthen framework conditions to establish a favourable outset for the cluster. In latent clusters, facilitation seeks to foster collaboration, create professional actor bonds and expand the trust already established, and in working clusters the objective is to generate business activities, create business actor bonds and exploit the existing trust. Furthermore, Aslesen and Pettersen (2017) outline how the setting of the cluster influences what is a suitable type of cluster facilitation and they conclude that cluster facilitation must adjust to the clusters' knowledge base and innovation mode. Similarly, Giest (2015) stresses that cluster facilitation must be linked to the stakeholder and government contexts that exist in the location of the clusters.

In summary, the research shows who takes on the role of cluster facilitator, what they aim to achieve and what activities they perform. Yet, there is relatively little information on how they do their job, including the kind of challenges they face in their work when facilitating cluster actors from industry, academia and government.

Institutional logics

To analyse the kind of challenges cluster facilitators face in the form of barriers and drivers when facilitating cluster actors from industry, academia and government, the concept of institutional logics becomes relevant. Institutional logics is one of the key concepts in sociological theory and organisational studies, as it aims to capture how broader belief systems shape the cognition and behaviour of actors. The paper subscribes to the definition of institutional logics by Thornton and Ocasio (1999, p. 804): "the socially constructed, historical patterns of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality". Öberg and Shih (2014) note that the link between interests, priorities, interaction goals and logics has previously been observed by other researchers such as Azadegan et al. (2011) and Dunn and Jones (2010). They argue that interests, priorities and

interaction goals only tentatively capture an actor's motivations and that interaction goals follow from interests and priorities. Thus, logics indicate reasons or motivations for individual and collaborative actions (Öberg and Shih, 2014).

In line with this, researchers have empirically analysed how logics can focus the attention of key decision-makers on a set of issues and solutions (Ocasio, 1997). Studies show how different logics lead to logic-consistent decisions (Thornton, 2002). The research also highlights the importance of dominant logics and shifts from one logic to another (Thornton, 2002). This stresses that dynamics and change are embedded in institutional logics. Scott et al. (2000) examined institutional change and analysed logic shifts and change in U.S. healthcare, and Thornton and Ocasio (1999) analysed the transition from professional to market logics in U.S. higher education publishing. Altogether, research shows that logics develop over time, logics change, and they may also be reshaped through interactions with other actors (DiMaggio and Powell, 1983; Öberg and Shih, 2014).

Only a handful of studies have mapped the relationship between the institutional logics approach and collaboration between industry, academia and government. In the field of triple helix research, Benner and Sandström (2000) highlight that industry, academia and governmental actors possess different logics. They examined national governmental funding agencies that collaborate with industry and academia and found contrasting logics. The case study in drug development by Öberg and Shih (2014) examines the interorganisational interaction between industry actors who were "developers" and "manufacturers" and public actors who were "policy makers", and found several typical differences between their logics. "Developers" were interested in creating and bringing forward new ideas and therefore they were willing to interact with other actors to share developments. "Manufacturers" were more interested in creating value and interacted to develop and sell commercial applications of scientific novelties, whereas "policy makers" were interested in promoting and strengthening particular sectors of the economy and supporting innovation in these sectors. These studies indicate that the three actor types - industry, academia and government - typically follow differing institutional logics, which may complicate their interaction and collaboration.

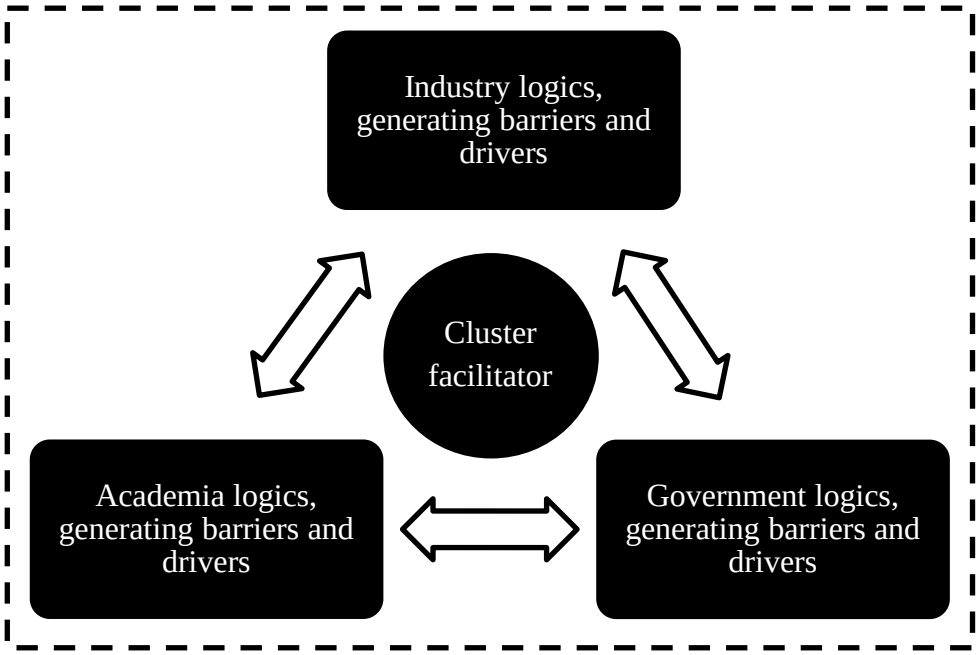
There are contrasting viewpoints on the consequences of such logic diversity and inconsistency. While some studies associate multiple logics with conflict, others suggest that logic multiplicity increases innovativeness (Besharov and Smith, 2014; Battilana and Dorado, 2010). The inconsistencies between logics are pointed out already in the early conceptualisations by Friedland and Alford (1991), and Thornton and Ocasio (2008) argue that the institutional logics perspective uncovers the contradictions that emerge in beliefs and practices. Thereby, Besharov and Smith (2014) suggest that by analysing compatibility and consistency of different logics it is possible to trace back to different goals, values and beliefs.

Altogether, the above studies suggest that the institutional logics approach offers valuable insights into intra-organisational processes affecting organisational practices, change and success. The studies also highlight the efforts needed to understand institutional complexity due to conflicting or inconsistent logics that can turn into barriers to collaboration and interaction. In addition, logics draw attention to how interaction patterns between multiple actors, following differing logics, are created or resisted (Öberg and Shih, 2014). As Öberg and Shih (2014) show, collaborating actors need to have similar priorities, as well as similar or complementary interests and interaction goals to succeed in collaboration.

A conceptual framework

With the aim of investigating how institutional logic diversity amongst cluster actors from industry, academia and government results in barriers and drivers that reflect cluster facilitation, a conceptual framework (Figure 1) is proposed for identifying and classifying these barriers and drivers. The framework comprises the following key elements: 1) cluster actors from industry, academia and government, which follow differing institutional logics, 2) a cluster facilitator to promote collaboration and knowledge-sharing, and 3) barriers and drivers originating from differing logics and affecting cluster facilitation.

Figure 1: Conceptual framework



RESEARCH METHOD

The paper applies an explorative single case study research strategy to identify and classify the barriers and drivers that arise when facilitating cluster actors from industry, academia and government. A case study is appropriate for meeting this purpose as it allows exploring a social phenomenon, such as clusters, that is not easily separable from its context (Easton, 1995; Halinen and Törnroos, 2005) and because it is the preferred way of researching clusters and cluster-based phenomena (Acs and Varga, 2002). The particular case for this paper is a circular economy cluster from Finland. It was purposively chosen as it involves a rich set of cluster actors representing various institutional logics as well as having an appointed cluster facilitator in charge of development.

The case study is based on both primary and secondary data so as to uncover the institutional logics embedded in the cluster actors. Table 1 outlines the data-generating techniques used and which types of data were generated. The data is used retrospectively and in real time, which is typical for qualitative research on inter-organisational matters (Halinen et al., 2012). The data was generated in collaboration with the cluster stakeholders being studied as part of two EU-funded projects: SCREEN (grant no. 730313) and the Kyvykäs project (code A72844). It took place during the period between November 2016 and December 2017.

Table 1: Overview of data

Data-generating techniques	**Types of data**
Interviews	14 interviews with industry actors 50 interviews with academia actors 20 interviews with government actors 24 interviews with the cluster facilitator
Observations	12 workshops 2 advisory board meetings 17 networking meetings 3 visits to living labs
Presentation materials	Over 200 seminar presentations Over 20 articles in media Over 20 videos Over 10 newspaper articles Over 130 websites and brochures Over 20 internal documents
Minutes, reports and publications	Over 12 minutes from meetings Over 80 memos from meetings and events Over 10 scientific papers Over 25 reports
Others	4 databases for statistics 7 surveys

In the process of analysing the data, the logic of abductive reasoning was followed, as it is particularly useful for theory development (Andersen and Kragh, 2010; Dubois and Gadde, 2002). Existing research knowledge was pieced together with the empirical insights derived from the case study, resulting in a modification of the conceptual framework (Figure 1). In practice, the data analysis started by first identifying the cluster actors and their logics. Afterwards, it was analysed how these logics were reflected while the cluster actors engaged with each other under the facilitation of the cluster facilitator.

During the data analysis, the authors drew various triad figures and organised aspects of the framework in multiple tables and then compared these. To improve the quality of the analysis, different types of triangulation were applied (Denzin, 1978). By generating diverse types of data from different cluster actors, data triangulation was increased, and by involving all three researchers in the data analysis, researcher triangulation was enhanced.

CASE STUDY: A CIRCULAR ECONOMY CLUSTER

Overview of the cluster

The circular economy cluster is located in the Tampere Region, which is situated in Western Finland, and its epicentre is around the region's capital, the City of Tampere. The cluster focuses on sustainability across different sectors by, amongst other things, 1) reducing personal ownership of products by sharing, renting and leasing products, 2) prolonging products use by maintaining, repairing and upgrading them, 3) reusing products by reselling, refurbishing and remanufacturing them, 4) material recycling and chemical recovery through closed and open loop recycling and biochemical feedstock recovery, and finally 5) using waste as an energy source or making renewable fuels such as biogas from municipal waste.

The origin of the cluster can be traced back to the industrial blossoming of the Tampere Region in the 1800s, which led to an establishment of textile, metal and wood industries. Later, the manufacturing industry broadened to include machinery and higher technology production, and more recently also health and ICT. The focus on circular economy is mainly for three reasons. Firstly, energy efficiency and eco-efficiency have been central in both industry and research for several decades and currently there is a strong representation of cleantech firms in the region. Secondly, since 1996 the region has multidisciplinary offerings in research and education in environmentally sustainable development, which enables a multifaceted environmental knowledge base. Thirdly, the rising acknowledgement of planetary boundaries since the 1970s has led to increasing governmental goals and regulative actions towards circular economy business, focusing particularly on recycling and reducing waste. However, it must be noted that the intentional development period of the cluster is relatively short, initiating from the strong circular economy movement on national and international levels starting in 2014.

Presently, the cluster consists of over 300 industry actors, 10 academia actors and more than 20 government actors. Key government actors are regional and city authorities as well as economic development agencies, whereas the core academia actors are a local technical university and a national research organisation. From industry, a diverse set of actors take part and they come mainly from these sectors: heavy machinery, construction, paper and packaging, energy, waste management and water management. Based on a recent baseline analysis, the circular economy cluster is most active in industrial-scale materials recycling, nutrient recovery from water and producing bio-based fuels (Halonen et al., 2017).

Industry logic and emerging barriers and drivers

The core logics existing amongst the industry actors in the cluster relate to seeking business opportunities and cost savings from a circular economy perspective. Also, the agenda of sustainability influences their strategic decisions and arguments. This is especially due to regulatory and political pressure on both a national and international level. However, this logic influences the sectors that comprise the cluster differently. Sectors such as energy, materials recycling, water management, and pulp and paper are strongly investing in new technology to grasp new business opportunities, whereas the machinery sector has few active firms and is stagnated. In addition, various start-ups are found in the cluster, attracting both national and international investors.

The sectorial diversity of the cluster sets barriers and drivers for the cluster facilitation. Since the cluster firms are situated in dispersed value chains with differing starting points and needs, the cluster facilitation must simultaneously be able to interact on the entire cluster level, but also provide services customised to the needs of different individual firms and their sectorial value chains. Furthermore, the cluster is highly dependent on key industry actors and their interests. This is due to the fact, amongst other things, that since the cluster applies the living lab approach, which ties actors into local settings, one context-dominant driver for interaction between firms is to find synergies from using others' waste as raw materials in their own production.

Academia logic and emerging barriers and drivers

The logics dominating the cluster actors from academia are multifaceted, but the basic logic concerns the creation of new knowledge with a strong industry orientation. Several technical research organisations take part in the cluster and they have a long historical track record with

industry-intensive collaboration. This has fostered trust and strong personal relationships between industry and academia. However, in the later years many changes were implemented in different funding programmes affecting the amount of money available for research and development. This has especially affected early-stage research since the funding focus has shifted towards market-driven research. In the wake of this, the unutilised know-how and early-stage research in the cluster are seen as a potential for innovation.

The main barriers to facilitating academia actors and their interaction in the cluster concern the funding time horizon. The nature of research and the relatively heavy cost structures of research organisations promote long-term planning. Yet, the relatively short funding schemes cause inability to plan longer than a few years ahead. In addition, some barriers seem to be visible in the competition between local research organisations. On the other hand, the key driver for facilitating research collaboration is to discover new solutions for current societal challenges. There seem to be promising new openings in the cluster, such as smart bio-based solutions and resources from water solutions, which combine the latest research results from different fields.

Government logic and emerging barriers and drivers

Government actors related to the cluster aim to provide resources and strengthen framework conditions that support the activities and ambitions of the cluster. This takes place through public funding programmes targeting societal challenges such as pollution and waste reduction. Also, the relatively high environmental know-how with these actors sets high demands for the cluster, which is believed to benefit in the long run. Government actors also tend to promote different kinds of platform-structured innovation services.

There are different reasons for government actors to facilitate clusters and, from an economic perspective, they seek to develop the cluster's competitiveness. However, a barrier for this goal is that the decisions on regulations are made based on the local context and are in many cases in conflict with the needs of the cluster. Dominant drivers for government actors to facilitate clusters, including the process from research results to concrete business and investments, include open research and testing laboratories, innovative funding instruments and piloting areas.

CONCLUSIVE DISCUSSION

In alignment with the institutional logics of each actor type - industry, academia and government - several recognised barriers and drivers for facilitating clusters are identified. Table 2 classifies the identified barriers and drivers on four different cluster interaction levels. The four levels are: 1) barriers and drivers originating from one actor, 2) barriers and drivers that concern one actor group, 3) barriers and drivers arising from interaction between two actor groups, and finally 4) barriers and drivers relating to all actor groups in the same cluster context.

Table 2: Barriers and drivers in a circular economy cluster from Finland

Cluster interaction level	Barriers	Drivers
1. Individual barriers and drivers (one actor) related to individual logics		
government	lack of meters for cluster's performance and effects	strong strategical goals and external drivers from EU- and national level
academia		high dependence on research funding
		a lot of early stage research results and technological know how
industry		new business opportunity, ROI
		long term development decisions
2. Individual barriers and drivers (one actor group) related to individual logics		
government-government	decisions on politics and regulations on national- and EU level, little means on local level	good connection and collaboration between governmental offices
		high level of environmental regulation know how
		strong common goals
academia-academia	competition for research fundings causes conflicts	drivers for finding solutions for systemic challenges
industry-industry	dispersed value chains in different sectors with various needs	industrial symbiosis
	key actors role and interests	visibility of eco-industrial parks
		positive ground for start ups and meeting investors
3. Dyadic barriers and drivers concerning interaction between two involved parties		
government-academia	innovation platforms fit with academia culture	opening research and testing facilities
	funding for early stage research difficult	
academia-government	return of investments long in early stage research	attractiveness for highly educated people
government-industry	long and heavy bureaucracy with new technology	innovative funding instruments
		piloting area, risk division
industry-government		tax income and jobs creation
		CO2-reduction, emissions
academia-industry		knowledge and technology transfer
		mature research results into business
industry-academia	short term R&D collaboration in conflict with academia needs	existing long term personal relationships and high level of built trust
4. Network/Context level barriers and drivers that concern all the actors involved		
whole network	Innovation platforms meeting SMEs challenging, also other cultural change	Open and positive environment for collaboration
		Cluster attractiveness is broad

REFERENCES

Acs, Z. J., & Varga, A. (2002). Introduction to the special issue on regional innovation systems. *International Regional Science Review*, 25(1), 3-7.

Aldrich, H., & Zimmer, C. (1986). Entrepreneurship through Social Networks. In D. L. Sexton, & R. W. Smilor (Eds.). *The Art and Science of Entrepreneurship* (pp. 3-23). Cambridge: Ballinger.

Andersen, P. H., & Kragh, H. (2010). Sense and sensibility: two approaches for using existing theory in theory-building qualitative research. *Industrial Marketing Management*, 39(1), 49-55.

Aslesen, H. W., & Pettersen, I. B. (2017). Entrepreneurial firms in STI and DUI mode clusters: do they need differentiated cluster facilitation? *European Planning Studies*, 25(6), 904-922.

Azadegan, A., Porobic, L., Ghazinoory, S., Samouei, P., & Kheirkhah, A. S. (2011). Fuzzy logic in manufacturing: a review of literature and a specialized application. *International Journal of Production Economics*, 132(2), 258-270.

Baraldi, E., & Strömsten, T. (2009). Controlling and combining resources in networks from Uppsala to Stanford, and back again: the case of a biotech innovation. *Industrial Marketing Management*, 38(5), 541-552.

Batterink, M. H., Wubben, E. F. M., Klerkx, L., & Omta, S. W. F. (2010). Orchestrating innovation networks: the case of innovation brokers in the agri-food sector. *Entrepreneurship & Regional Development*, 22(1), 47-76.

Battilana, J., & Dorado, S. (2010). Building sustainable hybrid organizations: the case of commercial microfinance organizations. *Academy of Management Journal*, 53(6), 1419-1440.

Benner, M., & Sandström, U. (2000). Institutionalizing the triple helix: research funding and norms in the academic system. *Research Policy*, 29(2), 291-301.

Besharov, M. L., & Smith, W. K. (2014). Multiple institutional logics in organizations: explaining their varied nature and implications. *Academy of Management Review*, 39(3), 364-381.

Bocquet, R., & Mothe, C. (2015). Can a governance structure foster cluster ambidexterity through knowledge management? An empirical study of two French SME clusters. *Knowledge Management Research & Practice*, 13(3), 329-343.

Borrás, S., & Tsagdis, D. (2008). *Cluster Policies in Europe: Firms, Institutions, and Governance*. Cheltenham: Edward Elgar.

Burt, R. (1992). *Structural Holes: The Social Structure of Competition*. Cambridge: Harvard University Press.

Christensen, J. L., & Stoerring, D. (2012). Facilitating Cluster Evolution in Peripheral Regions: The Role of Clusterpreneurs. In B. T. Asheim, & M. D. Pirelli (Eds.). *Interactive Learning for Innovation: A Key Driver within Clusters and Innovation Systems* (pp. 137-160). Houndmills, Basingstoke, Hampshire: Palgrave MacMillan.

Coletti, M. (2010). Technology and industrial clusters: how different are they to manage? *Science and Public Policy*, 37(9), 679-688.

Coombs, R., Harvey, M., & Tether, B. S. (2003). Analysing distributed processes of provision and innovation. *Industrial and Corporate Change*, 12(6), 1125-1155.

Denzin, N. K. (1970). Strategies of Multiple Triangulation. In N. K. Denzin (Ed.). *The Research Act: A Theoretical Introduction to Sociological Methods* (pp. 297-313). New Brunswick: Aldine Transaction.

Dhanaraj, C., & Parkhe, A. (2006). Orchestrating innovation networks. *Academy of Management Review*, 31(3), 659-669.

DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: collective rationality and institutional isomorphism in organizational fields. *American Sociological Review*, 48(2), 147-160.

Dubois, A., & Gadde, L. E. (2002). Systematic combining: an abductive approach to case research. *Journal of Business Research*, 55(7), 553-560.

Dunn, M. B., & Jones, C. (2010). Institutional logics and institutional pluralism: the contestation of care and science logics in medical education, 1967-2005. *Administrative Science Quarterly*, 55(1), 114-149.

Easton, G. (1995). Methodology in Industrial Networks. In K. Moller, & D. T. Wilson (Eds.). *Business Marketing: An Interaction and Network Perspective* (pp. 411-492). Norwell: Kluwer.

Feldman, M., & Zoller, T. D. (2012). Dealmakers in place: social capital connections in regional entrepreneurial economies. *Regional Studies*, 46(1), 23-37.

Fosse, J. K., & Normann, R. (2017). Management Strategies in Cluster Projects: Cases and Discussion. In R. Hassink, & D. Fornahl (Eds.). *The Life Cycle of Clusters: A Policy Perspective*, (pp. 115-134). Cheltenham: Edward Elgar.

Friedland, R., & Alford, R. R. (1991). Bringing Society Back In: Symbols, Practices and Institutional Contradictions. In W. W. Powell, & P. J. DiMaggio (Eds.). *The New Institutionalism in Organizational Analysis* (pp. 232-263). Chicago: University of Chicago Press.

Fritsch, M., & Kauffeld-Monz, M. (2010). The impact of network structure on knowledge transfer: an application of social network analysis in the context of regional innovation networks. *Annals of Regional Science*, 44(1), 21-38.

Fromhold-Eisebith, M., & Eisebith, G. (2005). How to institutionalize innovative clusters? Comparing explicit top-down and implicit bottom-up approaches. *Research Policy*, 34(8), 1250-1268.

Gagné, M., Townsend, S. H., Bourgeois, I., & Hart, R. E. (2010). Technology cluster evaluation and growth factors: literature review. *Research Evaluation*, 19(2), 82-90.

Giest, S. (2015). Network capacity-building in high-tech sectors: opening the black box of cluster facilitation policy. *Public Administration*, 93(2), 471-489.

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360-1380.

Halinen, A., Medlin, C. J., & Törnroos, J. Å. (2012). Time and process in business network research. *Industrial Marketing Management*, 41(2), 215-223.

Halinen, A., & Törnroos, J. Å. (2005). Using case methods in the study of contemporary business networks. *Journal of Business Research*, 58(9), 1285-1297.

Hallencreutz, D., & Lundequist, P. (2003). Spatial clustering and the potential for policy practice: experiences from cluster-building processes in Sweden. *European Planning Studies*, 11(5), 533-547.

Halonen, N., Alakerttula, J., Lanz, M., & Seppänen, M. (2017). *Pirkanmaan kiertotalouden innovaatiotoiminnan nykytila*. Pirkanmaan liitto. Available at: http://www.pirkanmaa.fi/wp-content/uploads/Pirkanmaan-liiton-selvityksi%C3%A4-2017_Pirkanmaan-kiertotalouden-innovaatiotoiminnan-nykytila_p_2.pdf. Accessed March 2018.

Hanna, V., & Walsh, K. (2002). Small firm networks: a successful approach to innovation? *R&D Management*, 32(3), 201-207.

Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, 35(5), 715-728.

Huggins, R. (2001). Inter-firm network policies and firm performance: evaluating the impact of initiatives in the United Kingdom. *Research Policy*, 30(3), 443-458.

Ingstrup, M. B. (2013). *The Role of Cluster Facilitators in Facilitating Clusters: Empirical and Theoretical Investigations*. Odense, University Press of Southern Denmark.

Ingstrup, M. B., & Damgaard, T. (2013). Cluster facilitation from a cluster life cycle perspective. *European Planning Studies*, 21(4), 556-574.

Inkinen T., & Suorsa K. (2010). Intermediaries in regional innovation systems: high-technology enterprise survey from northern Finland. *European Planning Studies*, 18(2), 169-187.

Klerkx, L., & Leeuwis, C. (2008). Matching demand and supply in the agricultural knowledge infrastructure: experiences with innovation intermediaries. *Food Policy*, 33(3), 260-276.

Klijn, E. H., Steijn, B., & Edelenbos, J. (2010). The impact of network management on outcomes in governance networks. *Public Administration*, 88(4), 1063-1082.

McEvily, B., & Zaheer, A. (1999). Bridging ties: a source of firm heterogeneity in competitive capabilities. *Strategic Management Journal*, 20(12), 1133-1156.

McEvily, B., & Zaheer, A. (2004). Architects of Trust: The Role of Network Facilitators in Geographical Clusters. In R. M. Kramer, & K. S. Cook (Eds.). *Trust and Distrust in Organizations: Dilemmas and Approaches* (pp. 189-213). New York: Russell Sage Foundation.

Mesquita, L. F. (2007). Starting cover when the bickering never ends: rebuilding aggregate trust among clustered firms through trust facilitators. *Academy of Management Review*, 32(1), 72-91.

Molina-Morales, F. X. (2005). The territorial agglomerations of firms: a social capital perspective from the Spanish tile industry. *Growth and Change*, 36(1), 74-99.

Molina-Morales, F. X., & Martínez-Cháfer, L. (2016). Cluster firms: you'll never walk alone. *Regional Studies*, 50(5), 877-893.

Nauwelaers, C. (2001). Path-Dependency and the Role of Institutions in Cluster Policy Generation. In Å. Mariussen (Ed.). *Cluster Policies – Cluster Development?* (pp. 93-107). Stockholm: Nordregio.

Ocasio, W. (1997). Towards an attention-based view of the firm. *Strategic Management Journal*, 18(1), 187-206.

Öberg, C., & Shih, T. T. Y. (2014). Divergent and convergent logic of firms: barriers and enablers for development and commercialization of innovations. *Industrial Marketing Management*, 43(3), 419-428.

Porter, M. E. (2000). Location, competition, and economic development: local clusters in a global economy. *Economic Development Quarterly*, 14(1), 15-35.

Powell, W. W. (1990). Neither market nor hierarchy: network forms of organization. *Research in Organizational Behavior*, 12, 295-336.

Provan K. G., & Human S. E. (1999). Organizational Learning and the Role of the Network Broker in Small-Firm Manufacturing Networks. In A. Grandori (Ed.). *Interfirm Networks: Organizations and Industrial Competitiveness* (pp. 185-207). London and New York: Routledge.

Scott, W. R. (2000). *Institutional Change and Healthcare Organizations: From Professional Dominance to Managed Care*. Chicago: University of Chicago Press.

Snow, C. C., Miles, R. E., & Coleman, Jr., H. J. (1992). Managing 21st century network organizations. *Organizational Dynamics*, 20(3), 5-20.

Sydow, J., Lerch, F., Huxham, C., & Hibbert, P. (2011). A silent cry for leadership: organizing for leadership (in) clusters. *The Leadership Quarterly*, 22(2), 328-343.

Thornton, P. H. (2002). The rise of the corporation in a craft industry: conflict and conformity in institutional logics. *Academy of Management Journal*, 45(1), 81-101.

Thornton, P. H., & Ocasio, W. (1999). Institutional logics and the historical contingency of power in organizations: executive succession in the higher education publishing industry, 1958-1990. *American Journal of Sociology*, 105(3), 801-843.

Thornton, P. H., & Ocasio, W. (2008). Institutional Logics. In R. Greenwood, C. Oliver, R. Suddaby, and K. Sahlin (Eds.). *The Sage Handbook of Organizational Institutionalism*, (pp. 99-128). London: Sage Publications.

Van Lente, H., Hekkert, M., Smits, R., & Van Waveren, B. (2003). Roles of systemic intermediaries in transition processes. *International Journal of Innovation Management*, 7(3), 247-279.

Winch, G. M., & Courtney, R. (2007). The organization of innovation brokers: an international review. *Technology Analysis & Strategic Management*, 19(6), 747-763.

Zagorsek, H., Svetina, A. C., & Jaklic, M. (2008). Leadership in clusters: attributes of effective cluster leader in Slovenia. *Transformations in Business and Economics*, 7(2), 98-113.