

Competitive paper

Submitted for the IMP 2009 Conference at Euromed Management, France

Cluster initiation and development: A critical view from a network perspective!

Abstract

The aim of this paper is to bring forward a broad IMP theoretical platform to found a base for discussion of the nature of business networks and clusters. This platform should then highlight cluster characteristics as well as stress that successful development and initiation of clusters is based on one or more well-established networks. In particular, the focus is on the similarities and differences between business networks and clusters in order to underline how the development of clusters can be understood as extensions of network development. The main result obtained from this investigation is that it seems as if the IMP network approach can contribute to the discussion of cluster development and initiation. It can provide deeper insight and more information to the development process than the various cluster approaches. On the other hand different cluster approaches are more nuanced on basic differences between actors with the concept of Triple Helix.

Keywords: Cluster, network, development, initiation, similarities, differences.

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1. Introduction

Throughout the years there has been an increasing focus on networks and clusters (Florida, 1996; Ford and Håkansson, 2005; Porter, 1998; Whittington et al., 2009) and their contribution to economic development (Brusco and Righi, 1989; Kenney and Florida, 1988). Clusters and networks are commonly used to explain how firms cooperate and interact (Ford and Håkansson, 2005; Håkansson, 1982; Håkansson and Snehota, 1995), but what kind of differences and similarities do these two types of relationships share? In current literature a set of ideas exists which overlap and connect network and cluster theories (DTI, 2001; Gordon and McCann, 2000; Markusen, 1996), and numerous studies suggest that networks are crucial for understanding the dynamics of clusters (Saxenian, 1994; Sorenson and Stuart, 2001). In relation to this Hoang and Antoncic (2003) have identified a need for further research and theory building in this area, as networks and clusters have different meanings to different groups inside different research traditions.

In the process of developing clusters, the value of an extended network from which to build a cluster has been stressed (Porter, 1998; Whittington et al., 2009), and in order to gain the benefits from the network approach in cluster development a further investigation of different network and cluster characteristics is needed. Although networks and clusters share similarities, clusters are usually understood as an agglomeration of interconnected actors in a certain geographical location whereas networks on the other hand are generally viewed as a web of actors in an institutional structure. To illustrate this link between clusters and networks, the paper draws on experiences and knowledge obtained from a cluster mapping project in the Region of Southern Denmark where it was observed that successful clusters are based on networks.

The aim of this paper is to bring forward a broad IMP theoretical platform to found a base for discussion of the nature of business networks and clusters. This platform should then highlight cluster characteristics as well as stress that successful development and initiation of clusters is based on one or more well-established networks. To fulfil that purpose we ask this question: How can the development of clusters be understood as extensions of network development? So far this topic has been touch upon by Pickernell et al. (2007) in a sociological and economic context but it has never been dealt with in an IMP network context. This stresses that the IMP literature lacks a general understanding of how networks and clusters are linked and how the development of clusters is influenced by networks due to their interconnectedness.

The paper is structured in three main sections. The first section contains a general description of the key theoretical schools of clustering and cluster definitions in order to bring about an understanding of what determines a cluster. This section is then followed by a comparison of characteristics of clusters and networks. Finally, the paper ends with a discussion where the empirical data from the cluster mapping project in the Region of Southern Denmark and the theoretical sections are combined in an illustration of the interconnectedness between networks and clusters in the developmental progression of clusters.

2. Cluster concepts and their theoretical platforms

In the following section it is clear that characteristics of clusters often are described as they were building on vertical and horizontal networks and their relations. But what is a cluster? There is no universal cluster definition, and even though the overall concept of clustering is very well described and explained, the underlying cluster definitions and the principals behind are characterized as broad and fuzzy (Hofe and Chen, 2006; Rosenfeld, 1995). This fuzziness is among other things caused by the fact that cluster definitions are used in different contexts and for different purposes e.g. regional development, analysis of innovative systems, etc. Cluster theory is a broad academic

field where scholars from many different research areas such as geography, business studies, economics and sociology are contributing. This does further add to the fuzziness, and as highlighted by Noteboom and Woolthuis (2005) the scientific background of the researcher influences the cluster definition chosen in a given analysis. In continuation of this, Maskell and Kebir (2006) examined the diversity of academic papers within the cluster discipline. Their main finding was that theories of clustering are part of a heterogeneous group of theoretical contributions, which are growing rapidly these years.

The lack of a common definition regarding clusters has complicated the picture. The picture is further complicated due to the increased popularity of the phenomenon among policy makers, which to some extent has meant that the concept is applied in a wider range of situations than intended and without a coherent understanding (Dahl, 2003). The different kind of definitions will be discussed later in this paper, but first we will turn to the most dominant theoretical schools of clustering in order to present the fundamental knowledge behind the essence of clustering, and to establish a frame of reference for the ongoing purpose of the paper.

3. Five theoretical schools of clustering

Having mentioned that the theories of clustering are part of a heterogeneous and broad group of theoretical contributions, it is both relevant and essential to provide an overview and understanding of the main theoretical schools of clustering. Starting with table 1, we will take a closer look at the dominating schools in this area of research. Reading through literature on clusters we have identified five dominating schools (Dahl, 2003; Hofe and Chen, 2006; Stoerring, 2007).

Table 1: The five dominating schools of clustering

Theoretical schools of clustering	General understanding of clusters
Alfred Marshall	Clusters are a group of establishments belonging to the same industry within regional geographic boundaries. The focus is on the direct benefits of co-location.
Italian industrial districts	Clusters are characterized by particular social relationships and interactions among the firms involved. These relationships consist of a mixture of both cooperation and competition. The innovative capacity of SMEs belonging to a particular industry in the same region is highlighted as a main driver behind development.
Economic and industrial geography	Clusters are based on the general idea that regions develop different kinds of inter-firm networks, specific institutional set-ups, and specific forms of economic, cultural and political practices over time.
Michael Porter	Clusters are geographic concentrations of inter-connected firms and institutions in a particular field. Clusters encompass an array of linked industries and actors important to competition and cooperation both up- and downstream the value chain e.g. suppliers, customers.

Regional innovation systems and learning regions	Clusters are perceived as learning and knowledge constructions, which add to localized adjustment and innovation processes in favour of knowledge creations.
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Source: Own compilation.

Alfred Marshall

Marshall (1930) is usually cited in the literature as the first to acknowledge the connection between the economic productivity of firms and business results with the location and proximity of economic actors. Marshall came to the conclusion that competitive firms in similar industries have a tendency to locate in the same geographical area, as he was studying the location of the English textile production. He noticed that the productions were not located equally across the country, but had a tendency to be located in a relatively small number of cities. Those textile producers not located in these cities did not perform as well as those that were. So instead of focusing on the individual location of firms relative to other factors as the traditional location economists had (Von Thünen, 1826; Weber, 1909), he changed research focus towards the direct benefits of co-location of firms.

Marshall (1930) identified three overall sources which were fostering spatial cluster formation through increasing returns to scale in the long run: Knowledge spillovers, labour pooling and cost advantages caused by economies of specialization:

1. Knowledge is generally believed to flow more easily between local actors than over longer distances. This influences the local inter-firm cooperation.
2. Labour pooling benefits present as well as attracting new firms to a certain geographical area. Pooling of labour is generally argued to have two types of advantages: Knowledge transfer and improvement of industry skills.
3. The extended division of labour benefits the level of specialization and leads to increased inter-firm cooperation with extensive activity links and resource ties. Enhanced cooperation through sharing resources might lead to sharing the cost of innovation.

Italian industrial districts

The literature on Italian industrial districts, as described by Becattini (1990) and Sforzi (1990), parallels Marshall with greater focus on the social aspects. The literature focuses on the innovative capacity of small and medium-sized enterprises belonging to a particular industry in the same region (Brusco, 1990). The awareness of this school of clustering and the reason why it grew considerably in the late 1970s was primarily due to the success of several Italian cities and regions. The intention of Becattini, who is one of the main contributors to this school, was to move the centre of attention from the individual firms to the cluster of interconnected firms in small geographic areas (Dahl, 2003). This is a key difference between this school and the Marshallian school of clustering.

In the literature, industrial districts are typically described as agglomerations, which are characterized by social relations and inter-firm cooperation and competition (Dahl, 2003). As a result of this competition, there is a strong local division of labour in a district, where firms are specialized in different parts of the value chain (Brusco, 1990). In these districts, it is the small firms which are the main drivers behind the process of innovation, and that process is carried out as a social coordinated procedure influenced by behavioural patterns including standards that governs interaction (Dei Ottati, 1994).

The interaction in the industrial districts is not limited to only covering firms, but it also involves interaction between institutional and market actors. In this interaction, a common understanding of the factors influencing growth and development of the district is formulated (Dahl, 2003). The value of this kind of interaction is stressed further in the Michael Porter school of clustering.

Economic and industrial geography

The third school of clustering is made up by scholars from the field of economic and industrial geography, and it combines the ideas derived from the literature on industrial districts: Flexible production systems, social regulation, transaction cost economics and also local community dynamics relations (Dahl, 2003; Moulaert and Sekia, 2003). Economic geographers contribute with a focus on the political, economic, institutional and social issues, which is related to regional development and agglomeration (Martin, 1999).

The cluster approach in this theoretical school of clustering is based on the general idea that regions develop different kind of inter-firm networks, standards, norms as well as institutional and economic set-ups. These aspects are part of the surrounding framework, which influence the development of regions in a certain direction (Storper, 1995). As to be subtracted from the above, the inter-firm networks do both include traded as well as untraded relations between the parties involved, and these relations are equally important for the survival of clusters. The traded relations are characterized as commercial input and output relations, whereas the untraded relations include the social interplay, which is not traded in a market.

Michael Porter

Until now the theoretical schools of clustering have been based on theories inspired or derived from agglomeration economics, like Marshall's localization economies. When Porter's cluster approach was introduced in the 1990s, the scope of the concept broadened by defining clusters as: A geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (Porter, 1998, p. 199). Based on this definition, clusters encompass different types of actors with different goals and motivation, including suppliers, customers and also governmental and other public institutions such as universities, colleges, standard-setting agencies, think tanks, vocational training providers and trade associations and missions (Porter, 1998).

The Michael Porter school of clustering is more a synopsis of accepted agglomeration phenomena rather than new groundbreaking insights explaining the reasons for firms to group in a certain geographical area (Martin and Sunley, 2003). Porter's contribution is to refocus the innovative nature of competition and stress that the success of clusters relies on several factors outside the individual firm and cluster e.g. factor conditions and demand conditions (Hofe and Chen, 2006). Enright (2001) highlights that clusters can be understood and analyzed by describing a series of elements e.g. geographic scope, density, breadth, activity base, geographic span of scales, stage of develop-

ment, innovative capacity and ownership structure, and that this is central information for developing cluster policy aimed at exploring the potentials and possibilities of clusters.

The theoretical framework surrounding Porter's cluster approach is intended to bring forward policy proposals. The intention is that governments should play an active role in establishing and upgrading factor conditions by politically paving the way and eliminating and removing inefficiencies that hamper cluster innovation and productivity (Dahl, 2003). This governmental activity should not mistakenly be understood as a welcoming of new clusters built from almost nothing and promoted by government initiatives. Overall, with the introduction of the Michael Porter school of clustering, the focus is moved from the social relations that keep clusters together and toward the traded relations of clusters.

Regional innovation systems and learning regions

The last major theoretical school of clustering concerns the regional innovation systems and learning regions from the end-1990s. The school shares similarities with the Michael Porter school of clustering and builds primarily upon the literature from the research area of national innovation systems (Dahl, 2003). In this school the role of knowledge institutions as a supplier of inputs to the innovation and production processes in clusters is stressed (Stoerring, 2007) and so is the importance of knowledge-based contributions from private enterprises and public agencies. This mixture of both private enterprises, public agencies and research institutions is also known as the Triple Helix approach, which relates to the ideas from this school of clustering (Etzkowitz and Leydesdorff, 2000).

The role of collective learning is highlighted in the literature on innovation systems and is a result of the cooperation among different kind of actors (Edquist, 1997). As stated by Dahl (2003) the interaction between actors is part of an innovation process. This process is not seen only as a technological process, but also as an organizational learning process. In continuation of this, clusters in this theoretical school are perceived as learning and knowledge constructs, which adds to localized production and innovation in favour of strengthening and creating local knowledge spillovers.

Based on this general overview regarding the main theoretical schools of clustering, it is indicated that the particular area of research builds upon different approaches and theories which manifest itself in the way that cluster definitions are being formulated and used theoretically and in practice. In the following section we have grouped comparable cluster definitions, based on their roots to agglomeration economies or cluster theories. The aim is to combine the above-mentioned theoretical schools of clustering with key cluster definitions in order to obtain an understanding of what is a cluster.

4. Cluster definitions

None of the scholars from this field of research including those from the five different schools of clustering have been able to produce a commonly agreed upon definition regarding clusters during the last fifteen years. The available definitions are broad and are lacking clear direction regarding the activities, actors and boundaries of a cluster. This is one of the main problems with the literature, as emphasized by Martin and Sunley (2003) and by Maskell and Kebir (2006). Table 2 gives an overall insight to how differently clusters have been defined in the literature. The diversity by which the cluster term has been defined reflects the large number of people ranging from researchers to policy makers that have applied the concept.

Table 2: Cluster definitions, cluster schools and broad or narrow cluster definitions

Authors	Cluster definition	School of clustering	Broad or narrow definition
Enright (1996)	A regional cluster is an industrial cluster in which member firms are in close proximity to each other.	Alfred Marshall	N
Swann & Prevezer (1996)	Clusters are here defined as groups of firms within one industry based in one geographical area.	Alfred Marshall	N
Rosenfeld (1997)	A cluster is very simply used to represent concentrations of firms that are able to produce synergy because of their geographical proximity and interdependence, even though their scale of employment may not be pronounced or prominent.	Alfred Marshall	N
Feser (1998)	Economic clusters are not just related and supporting industries and institutions, but rather related and supporting institutions that are more competitive by virtue of their relationships.	Economic and industrial geography	B
Porter (1998)	A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities.	Michael Porter	B
Swann & Prevezer (1998)	A cluster means a large group of firms in related industries at a particular location.	Alfred Marshall	N
Roelandt & den Hertag (1999)	Clusters can be characterized as networks of producers of strongly interdependent firms linked to each other in a value-adding production chain.	Economic and industrial geography	N

Simmie & Sennett (1999)	We define an innovative cluster as a large number of inter-connected industrial and/or service companies having a high degree of collaboration, typically through a supply chain, and operating under the same market conditions.	Economic and industrial Geography	N
Crouch & Farrell (2001)	The more general concept of cluster suggests something looser: A tendency for firms in similar types of business to locate close together, though without having a particularly important presence in an area.	Alfred Marshall	N
Oakey et al. (2001)	Physical clustering exists where businesses locate in proximity to each other without any functional linkages between them and without deriving any special benefit from their location. Functional clustering arises where firms gain some benefit from being close to each other and these benefits explain why the co-location occurs.	Alfred Marshall	B
Van den Berg et al. (2001)	The popular term cluster is most closely related to this local or regional dimension of networks... Most definitions share the notion of clusters as localized networks of specialized organizations, whose production processes are closely linked through the exchange of goods, services and/or knowledge.	Economic and industrial geography	B
Cooke & Huggins (2002)	Geographically proximate firms in vertical and horizontal relationships involving a localized enterprise support infrastructure with shared development vision for business growth, based on competition and cooperation in a specific market field.	Michael Porter	B
Feser & Lugar (2002)	Concentrations of businesses that co-locate because of trading relationships and/or to share common factor markets (including infrastructure, knowledge, resources and labour) and/or common goods markets.	Michael Porter	B

Gault (2002)	Clusters are groups of private and public institutions linked together for a common purpose, which may be innovation.	Regional innovation systems and learning regions	N
Dicken (2003)	The basis of clusters lies in several characteristics: Localized patterns of communication, localized innovation search and scanning patterns, localized invention and learning patterns, localized knowledge sharing and localized patterns of innovation capabilities and performance.	Regional innovation systems and learning regions	B
Brenner (2004)	An industrial agglomeration that is caused by local self-augmenting processes.	Alfred Marshall	N
Perry (2005)	A cluster is a locality where companies are locked together in various forms of interdependence, like organisms in a biosphere.	Italian industrial districts	N

Source: Based on Martin and Sunley (2003) and own compilation.

The categorization of cluster definitions shows that the schools of Alfred Marshall, Michael Porter and economic and industrial geography are the dominating ones, which underline the previous statement that research on clusters is broad and covers studies ranging from clusters building on the theoretical principles of localization economies to clusters derived mainly from inter-industry relationships found in input-output tables, to clusters which encompass the widest spectrum of arguments explaining why actors group in geographic proximity, including economies of localization, internal returns to scale, value chain linkage, technology innovation, etc.

The distinction made in table 2 between narrow and broad cluster definitions is to be understood in relation to the two overall streams of cluster literature: Analytical and normative. In the analytical literature the narrow definition is often applied whereas the broad definitions are mostly used in the normative stream of literature (Rosenfeld, 1995; Stoerring, 2007). Stoerring concludes that this pattern is due to the simple reason that the choice of definition is a result of the overall purpose of the study, which is being conducted.

Based on the above descriptions, the illustrated diversity and scope of cluster definitions, the question of what basically determines a cluster calls for an answer. In the following, we have described some of the common cluster characteristics and factors.

5. Cluster determinants

In accordance with the presented diversity of cluster definitions, it is not uncomplicated to list common characteristics that determine a cluster. One of the reasons relate to the fact there is no given size to clusters in the theory, rather clusters are grouped based on the advantages of co-location due to the presence of other firms. But none of the definitions brings forward any estimation of what is meant by other firms. All definitions do, however, emphasize the local context of clusters, but there is no indication of the maximum distance between the involved actors in the cluster.

The concept of inter-firm relations is another important element in the definitions. The relations, be they vertical and/or horizontal, contribute to the development and strengthening of the cluster. As a fourth general cluster characteristic, clusters are producing synergies which outperform the benefits and values, which individual firms can produce on their own. Examples of localized cluster values based on synergies are specialized labour, tacit knowledge and innovation. Finally, clusters are characterized by the fact that all the actors involved in clusters share the same factor conditions in the institutional context surrounding the cluster.

Derived from the above, clusters across the different theoretical schools of clustering and cluster definitions can be described as: An agglomeration composed of actors in a geographical context where the actors are linked to each other while producing cluster synergies under influence of the same factor conditions. Clusters are systems in which membership is simply based on interdependence and making a contribution to the functioning of the system.

6. Clusters and networks

In the prior section, different theoretical schools of clustering and cluster definitions have been discussed. It was argued that particular cluster definitions are applied under certain contingencies and with different purposes. The way that clusters overall are defined seems to be parallel to the understanding of a business network within the IMP approach. Based on this it could be asked how the

understanding of business networks and clusters differ and how may the IMP network approach contribute to the cluster concept.

The IMP approach offers an understanding of inter-organizational networks very much in line with cluster definitions and approaches. A fundamental building block within the IMP approach is that firms may benefit from cooperation although competition often occurs at the same time (Harrison et al. 2004; Håkansson, 1982). Firms with similar characteristics seem to be more likely to cooperate, and that cooperation can take place within different organizational settings (Wilkinson et al. 2005). Networks and clusters seem therefore to be related notions of organizational settings for cooperation (Whittington et al., 2009). Networks consist of relationships which are characterized by resources, actors and activities, and the two actors which constitute a relationship will position themselves in relation to each other and in relation to actors in other relationships in the network. Positioning efforts are undertaken in line with the long term and short term aims of firms which both can be in conflict and accordance with the other firms in the network. In other words: The network approach suggests that a company and its relationships can only be understood as a part of a complex and dynamic network of interconnected relationships (Ritter and Ford, 2004, p. 104).

As stressed, cluster definitions are generally much in line with the definition of the IMP network approach as clusters often are defined as: A geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (Porter, 1998, p. 199). Building on the different definitions of clusters and business networks as well as the literature review, nine dimensions are derived from which a comparison of the two types of relationships can be made.

Table 3: Comparison between clusters and business networks

Dimensions	Cluster	Business network
Geographic scope	Locally embedded	Chain embedded
Activity scope	Horizontal and vertical	Horizontal and vertical
Resource constellation	Similar and complementary	Complementary
Innovative capacity	Business and product/service development	Business and product/service development
Competitive position	In-side out	Relational
Relationship governance	Interdependent	Interdependent
Actor types	Private & public	Private
Reality framing	Objective	Subjective
Initiation and development	Implant or organic	Organic

Source: Own compilation.

Geographic scope

Two of the most influential contributors within cluster theory Marshall (1930) and Porter (1998) have seen clusters as locally embedded. Seeing clusters as locally embedded may be problematic in a world more and more dominated by globalized markets and value chains. The role of “space” has to some extent been discussed within the IMP approach. Johnston and Araujo (2002, p. 1) has stated: Research in inter-organizational networks has stressed functional links in industrial networks but has neglected the role of space in fostering particular forms of relationships. Although Håkansson and Waluszewski (2004) offer some further insight by arguing: Space has costs aspects as relating takes time and adaptations will be made. At the same time space offers learning possibilities as certain places gives other possibilities for facilitating knowledge spill-over than anonymous markets. Achieving benefits by exploiting “place” is not necessarily limited to a special geographical area, but can be undertaken from distance too. Place can be summarized to: Place appears to be heterogeneous pheromone, created by each company at each place, because of its way of combining local and distant resources (Håkansson and Waluszewski, 2004, p. 257).

Activity scope

Activities within a cluster is often said to be about pooling efforts and using knowledge about close activities at the same vertical and horizontal level (Porter, 1998). Theorists behind business networks have both been interested in horizontal and vertical issues of cooperation and competition in the network. As the IMP approach has seen itself as a more adequate frame for understanding market phenomena. Much effort has been put into understanding how cooperation takes place between customers and sellers (Ford and Håkansson, 2005; Håkansson and Snehota; 1995).

Resource constellation

Clusters usually offer some insights to how closely related activities can be combined and the synergy effects that follow the increased value creation due to the inter-firm cooperation. Insights are offered regarding pooling of resources. Business networks offer insights regarding resources when they are part of a larger whole – the network. For the single actor the task is both to understand the resources in connection to the actual customer and in the network. Resources in the evolving constellation will be complementary as offerings should be beneficial for the firms involved.

Innovative capacity

Both clusters and business networks can be perceived as powerful devices for innovations. In business networks innovations can be understood in the firm, in the dyad, in the network and in the industry. Firms do not exist on their own but are evolving together with and as a result of interaction with other firms. Innovations are some of the core outcomes of cooperation with others. In other words these outcomes can be analyzed due to interaction patterns among the involved firms. Innovations may evolve out of the understanding of the network. In clusters innovations comes from combining rather close activities, resources, capabilities and actors in a new manner. The Triple Helix approach illustrates this and emphasizes the relevance of a constellation where both public agencies and research institutions take part. The argument is by involving these actors and combining their resources with those of private firms an increased innovation output occurs.

Competitive position

Clusters and business networks seem rather close in their conceptualization of competitive positions. The competitive position in a network is labelled network position. A network position is defined by the relationships with other firms (Johanson and Mattsson, 1992). Depending on benefits and obligations created in interaction with other firms the network position will be developed.

Clusters are to some extent about rivalry among the actors in a cluster, but it is mainly about creating a beneficial platform for competition in the value chain. This is stressed by Porter (1998). Porter points out that the internal rivalry in a cluster forces the involved actors to strengthen their resources, which adds to the pool of resources. This pool of resources is through inter-firm cooperation shared which adds to the platform of resources in the cluster.

Relationship governance

Business network theory mainly gives an understanding of how partnership oriented business relationships work, and how they can be analyzed and understood. Managerially the perspective is on relationships. Efforts are on what influences resource constellations, actor bonds and activity links, how resource constellations, actor bonds and activity links can be developed and what new combinations of links, ties and bonds may lower costs and create different or higher benefits.

Clusters are viewed as systems with interconnected private enterprises, public agencies and research institutions. The interconnectedness is organised differently through markets, norms, rules, etc. The governance is seen on an individual company level, how cost, innovation, etc. in the single firm can be on a better level because of the cluster. But, it can also be seen on a cluster level as an entity which can be guided through regional economic policy instruments.

Actor types

The IMP approach is rooted in the study of industrial firms (Ford, 2005; Håkansson, 1982), but has developed over the years and today it also includes studies of how the interplay is between the public and private sector (Möller and Rajala, 2007). Regarding business networks the interest lies on different types of actors, and the vast majority of studies have been on private firms and their interaction. Cluster analysis has very much been on different actor types such as private firms, public authorities, associations and others. What particular type of private or public association can best facilitate cluster development has been thoroughly examined by researchers (Etzkovitz and Leydersdorff, 2000; Stoerring, 2007).

Reality framing

As in micro-economic theory the market is a given entity, and the task is to monitor and identify possible market opportunities. The actor has the freedom of choice and can take advantage of the opportunities at hand and join the cluster freely. Sense-making is seen as a more objective framing process. Business network has introduced the concept of network picture (Ford and Håkansson, 2005). A network picture is constructed of the reality which the actor is part of. Network pictures are biased and include the perception of one's own and other actor's position in the network. The term network horizon is used to describe how wide the picture is! Sense-making is seen as a more subjective framing process. Cluster theories are often framed by reference to what is perceived as

existing clusters e.g. Silicon Valley, North Italian Districts, etc. Cluster theory often departs from empirical examples and is therefore often developed on the description of formal networks.

Initiation and development

Another difference between cluster and business networks is difference in creation. In recent years public authorities and politicians have discussed the possibilities of boosting innovation and growth (Stoerring and Christensen, 2004). Clusters have been seen as a device for boosting growth and innovation. De Langren (2002) has argued that a construction process can be initiated and developed following these three main steps:

1. Selection of a cluster core. A core consists of a spatial concentration of similar activities
2. Construction of intra cluster activities:
 - a. economic transactions
 - b. use of common resources
 - c. membership of associations
 - d. inclusion on learning systems
3. Delimiting the cluster

Following such a path is said to open the possibility to achieve the expected results in the form of a cluster. Examples of clusters which have grown organically and have been implanted can be found. Clusters are shaped in response to changing market conditions. The idea is to gain a competitive advantage by concentration of similar activities.

Business networks are not in the same sense possible to create. In some situations (i.e. hub organization) a firm may have a high impact on the creation process of the network and may be the initiator of it. But as the building block is relationships and the interaction among the firms involved, the creation process cannot be lead by one actor alone. Other firms than a major player can decide not to go into the relationship or choose to leave a relationship. Networks are therefore said to be shaped by its actors, due to their priorities and choices. A major difference seems to be that clusters are seen as something which can be created from the top and can be directed and planned. Business networks holds the stand that creation is an undertaking on different levels and that development cannot be understood solely from the point of one actor.

Clearly, clusters are easier to describe and discuss as clusters when they are empirically identities. On the other hand network models are theoretical constructs – a way of understanding actors, resources and activities. In the following a small empirical case is introduced in order to illustrate and sum up the usefulness of the above presented theoretical descriptions and thereby highlighting that development and initiation of clusters are based on one or more well-established networks.

7. Growing cluster initiatives in southern Denmark – an empirical illustration

Clusters have become a central feature for politicians in order to boost competitiveness, innovation and growth on national and regional levels. The focus of how to establish and develop clusters has therefore been placed on top of the political agenda. Several government policies are aimed at learning and imitating the success of well-known clusters, in the belief that their areas may also gain cluster related benefits like attracting new firms and highly educated manpower as well as the economic returns and spillovers that are supposed to follow this path.

The Regional Council of Southern Denmark has decided that cluster development should play a central role in the regional growth strategy, but clusters do not always develop by themselves and not necessarily in the speed and scope which is preferred from a political point of view. To support the formation and development of clusters and for clusters to meet their full potential, the role of public government initiatives strengthening factor conditions as well as improving networks within clusters are essential. For the regional council to add the accurate amount of incentives a cluster mapping project was initiated with the overall aim of drawing a picture of the cluster activities in the region.

The cluster project revealed in total 6 mature and well-establish clusters, 28 growing clusters and finally 27 potential clusters. The clusters were divided into these three categories based on their individual degree of formalizing, degree of leadership, access to resources and local engagement. The potential clusters are characterized as clusters with both strong local roots and strong economic potentials. Besides these elements the growing clusters are also described as having a critical mass made up by different kind of actors involved in the cluster as well as having strong coherence drivers. Additionally, the mature clusters have documented economics of scale and a formalized Triple Helix cooperation. With the intention of strengthening and unite the 28 growing clusters, they were grouped in ten different categories: Energy, food, environment, experience economy, plastic, steel, health, transport, security and tourism. All of the ten cluster categories contain different potentials and different drivers for development.

In accordance to highlight the potentials of the ten cluster categories, they were divided into three groups, respectively clusters with great potential, clusters with large potential and finally clusters with potential. This categorization is a logical result of the fact that the development of the next generation of clusters depends upon political initiatives which are typically characterized by limited resources. Based on the respective potentials and characteristics of the growing clusters, different political initiatives are needed for them to grow. The initiatives can be summarized as it follows:

1. The majority of the growing clusters lack coordination and a driving force to facilitate the developmental process. They need a cluster facilitator. The role of a cluster facilitator is to coordinate and lead the development of the cluster, and this can be done by different types of actors e.g. persons from private firms, or from public agencies.

On one hand a cluster facilitator can help identifying the pooling effort and provide guidelines for the use of the actors' knowledge in the network setting. The cluster approaches assume that facilitators can step into a cluster and do that work. Derived from the IMP approach it is clear that an actor only can function as a facilitator if he or she is part of the actor, resource and activity network in a way he or she can manage the relationships. Not many of today's facilitators are capable of this, because they come from outside semi-public organisations with no business responsibilities.

2. As a consequence of the limited amount of resources inside most of the growing clusters a central support function in helping with funds applications or other administrative tasks are strongly needed.

Clusters often focus on business routines and efficiency which lead to a lack of resources to support the overall “umbrella” of the clusters. A support function can provide good and relevant support to clusters, but again the IMP approach points to the fact that for clusters to take advantage of this support function, a well established and mutual business network is needed.

3. Many innovation projects inside the growing clusters are either closed or limited due to the administrative work load in the process of applying for funds or the availability of funds. To oblige these obstacles micro financial funds could provide capital with the purpose of supporting innovative environments inside clusters.

Administrative work when applying for funding is not a usual part of business networks. Therefore, to apply for funding it must be organised with a limited administrative work load.

4. The cooperation with research institutions in order to increase information sharing and innovation is inadequate. For an increased cooperation between clusters and research institutions a facilitator is needed in order to link the competences of both actors.

The IMP approach will argue that knowledge demand must be evident for the business network in order for the actors to engage in relations with research institutions. To initiate this it is often necessary to start informing about possible actions with research institutions. A facilitator could initiate this if he or she is part of the network or related to the business area of the network.

5. Finally, the growing clusters suffer from a lack of visibility in regard to their potentials and activities. This means to some extent that their possibilities of getting e.g. funds and new members are limited. A central branding or marketing function could help and could be integrated in the mentioned support function.

The IMP approach seldom takes branding and communication activities into consideration. Here it is questioned if this has any effect. Cluster approaches point to the obligations of clusters to act as an entity and for that to happen, marketing considerations on a collective level, such as branding of the cluster, needs to be considered.

These five political incentives generally raise the question regarding the role of leadership in cluster development and basically how to lead a cluster and whom to lead a cluster. All of the incentives indicate a lack of coordinating factors to formalize and link different type of actors and their competencies with each other in a network.

8. Conclusion

Different theoretical schools of clusters were presented in the first part of this paper. Here it was clear that the early understanding of clusters very much took depart from a neoclassic microeconomic tradition. The Porter school of clustering continue this line of thought, and here the cluster and managerial aspects of clusters assume private enterprises to be entities possible to manage in a

cluster environment. In the IMP approach this basis is criticized for missing the point, that firms are actors which develop in networks of interdependent actors and cannot be managed as isolated entities. According to the newest school of clustering this tendency towards management, firms or actors cannot be managed in a microeconomic or Porter sense. The school: The regional innovation systems and learning regions is in many ways built up in the same line of thought as the IMP tradition. But where the IMP tradition digs down in the network, the cluster approach focuses on the frame of networks instead.

Through the literature review and the Danish cluster mapping project, it becomes clear that the business network approach is much more theoretically driven in describing the development of inter-organisational relations than the cluster approach. To understand how growing clusters can become more mature, the cluster approaches primarily contribute to understanding the framework for network activity. The network approach gives more input to understand the characteristics of the network development, which is the prime source of the cluster development. In this sense the IMP-approach is seen as the needed supplement to cluster approaches when the goal is to get deeper beyond the frame for cluster development.

To understand the possibility of managing or rather the difficulties in managing clusters, the IMP approach gives an input which can develop the cluster approach beyond being a framework approach. Triple Helix occurs in cluster approaches and is an example of actor relations between very different actors with different interests and strategic purposes. This is a broader view which can contribute further to understanding how innovation occurs in conglomerations of networks as clusters than in the IMP approach. It seems like the IMP approach can contribute to the discussion of clusters development. It can give more insight into the development process than the cluster approaches can give. On the other hand the cluster approaches are more nuanced on basic differences between actors with the concept of Triple Helix.

9. References

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