



Journal of Science and Technology Policy Management

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Article information:

To cite this document:

Bruno Anicet Bittencourt, Aurora Carneiro Zen, Vitor Schmidt, Douglas Wegner, (2018) "The orchestration process for emergence of clusters of innovation", Journal of Science and Technology Policy Management, <https://doi.org/10.1108/JSTPM-02-2018-0016>

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<https://doi.org/10.1108/JSTPM-02-2018-0016>

Downloaded on: 16 November 2018, At: 13:26 (PT)

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The orchestration process for emergence of clusters of innovation

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Received 15 February 2018
Revised 8 September 2018
Accepted 19 September 2018

Abstract

Purpose – Requalification of neglected areas in urban contexts is considered as one of the main challenges for smart cities. Business clusters stand out as mechanisms of innovation for not only the clustered firms but also the territory in which they are located. However, the cluster emergence process is complex and still unknown. The purpose of this paper is to analyze the orchestration process in the emergence of a cluster of innovation (CoI).

Design/methodology/approach – This study is a qualitative exploratory research in Porto Alegre, a State capital in Southern Brazil, in the region known as 4th District. Data were collected through documentary research, non-participant observation and face-to-face in-depth interviews.

Findings – Results indicate the importance of alignment among network members, possible difficulties caused by members' heterogeneity and the need to disseminate information and interaction for the appropriability of knowledge and innovation in the emergence process of CoI. Coordination of actions and joint agenda as facilitators for the construction of a cluster identity emerge as crucial important. Besides, results also highlight that the entrepreneurial process and the perspective of global strategy are essential to build competitive advantage to the region.

Research limitations/implications – This paper brings a theoretical and managerial contribution to the application of the concept of orchestration to emergence of a CoI. The framework presents network components, orchestration components and the drivers to emergence of a CoI.

Originality/value – This study proposes a framework to link the orchestration process to the emergence of a CoI. The proposed framework could help policymakers and other actors to enhance the impact of a cluster on the development of the region.

Keywords Cluster, Orchestration, Emergence of cluster, Life cycle of cluster

Paper type Research paper

1. Introduction

Several studies showed that clustered firms tend to be more innovative and achieve superior economic performance in comparison with isolated ones (Marshall, 1920; Saxenian, 1994; Audretsch and Feldman, 1996; Capello and Faggian, 2005; Bell, 2006; Giuliani, 2010). Business clusters stand out as innovation mechanisms for not only the clustered firms but also the territory in which they are located (Porter, 1998; Schmitz, 1999). The extant literature has focused mainly on the benefits of clusters, how they can be characterized, and what elements make them successful (Trippel *et al.*, 2015). Nevertheless, the dynamic of clusters has been neglected in the literature and few scholars seek to understand the clusters life cycle and their mechanics (Hervas-Oliver and Albors-Garrigos, 2014).



The emergence is one of the most crucial phases of a cluster life cycle. The difficulty to identify a priori the emergence of a cluster is a reason of such importance (Menzel and Fornahl, 2010). Many agglomerations and projects, for different reasons, do not actually become a cluster (Martin and Sunley, 2011). Thus, the cluster emergence process is complex and still unknown, and consists of a set of prerequisites coupled with local triggers (Brenner and Mühlig, 2007). Hence, on starting a cluster, actors play a fundamental role since it is their responsibility to develop it (Henning, Stam and Wenting, 2013).

The concept of orchestration emerges as a set of activities aimed at the development, management and coordination of an agglomeration that seek to create and extract value from a network (Dhanaraj and Parkhe, 2006). Such capacity respects the specific identities of each actor involved and attempts to ensure that they continue to collaborate fruitfully (Parmentier and Mangematin, 2014). Considering clusters context, it is understood that orchestration arises as the possibility to guarantee the cluster survival and the generation of competitive advantage for the region.

Because of the success of these geographical agglomerations, several studies have been developed to propose public policies that support clusters development (Brenner and Schlump, 2011; Ingstrup and Damgaard, 2013; Yu *et al.*, 2014). Although important, cluster development policies do not ensure regional development (Darchen and Tremblay, 2015). Case studies often point to inefficient development policies that do not consider local needs (Brenner and Schlump, 2011; Ingstrup and Damgaard, 2013). Each agglomeration can be understood as a complex regional system (Martin and Sunley, 2011), which can offer benefits to a region if it is well managed (Yu *et al.*, 2014). Therefore, this study emphasizes the need of including the orchestration approach to better understand the emergence of geographical agglomerations and to enhance the impact on the development of the region.

Engel (2015) introduces the concept of cluster of innovation (CoI) within the context above. Contrarily to sectorial and geographic delimitation, CoI is a concentration of different actors, with certain behaviors, connected and not being linked to a specific industry in a defined geographical space (Engel and del-Palacio, 2009; Engel, 2015).

Considering the importance of business clusters for the creation of regional competitive advantages in a global environment, this paper aims to answer the following question:

RQ1: How does the orchestration process happens in the emergence of a CoI?

The purpose of this research is to analyze the orchestration process in the emergence of a CoI.

To answer this question, a qualitative exploratory research was carried out in Porto Alegre, a State capital in Southern Brazil, in the region known as 4th District. This region is undergoing a transformation process to become a CoI. The revitalization of 4th District is part of the resilience strategies in Porto Alegre, for which both the city government and civil society are working together to encourage the emergence of an innovation cluster.

2. Literature review

This section discusses the concepts of CoI and network orchestration.

2.1 Cluster of innovation

CoI can be understood as a set of components, behaviors and linkages working to promote innovation in a given area (Engel, 2015). The components are actors (people and organizations) that interact in the locality. The main components are the government, universities, entrepreneurs, research institutions, investors, consolidated companies and

local organizations (Engel, 2015). Behaviors are the actions responsible for creating cluster value. The critical behaviors of a CoI are defined as the mobility of resources (money, people and know-how/technology), entrepreneurial process (search for business opportunity, innovation and experimentation) and perspective of global strategy and alignment of objectives. This articulation among the actors is needed for developing a collective strategy and enabling the emergence of a CoI. The linkages are relations of the cluster and its members, and may be weak ties, durable relations and covalent relations.

This research is based on definitions of CoI by Engel and del-Palacio (2009) and Engel (2015) and considers that clusters main positive externalities are derived from the interactions between firms and institutions; and that the cluster concept requires an update to explain the most recent agglomerations. Thus, cluster would be the agglomeration of different components (entrepreneurs, universities, government, etc.) with certain behaviors (mobility of resources, alignment of interests, incentives and objectives, perspective of global strategy and entrepreneurial process) connected by different links (weak ties, durable relations, covalent relations, etc.) in a delimited region.

Cluster has become an important topic of discussion in several areas, such as economy, geography and administration (Morosini, 2004), but there are still few studies that seek to understand the life cycle of clusters and their operation (Hervas-Oliver and Albors-Garrigos, 2014). Thus, next session explores the phenomenon of cluster emergence.

2.2 Emergence of a business cluster

Determining the origins of the cluster accurately is still a challenge (Menzel and Fornahl, 2010), as it is almost impossible to guess where a cluster will take root (Maskell and Malmberg, 2007). The emergence phase is difficult to identify, but it is at this stage that the bases and the growth process are formed (Menzel and Fornahl, 2010). Cluster emergence can be triggered because of a series of endogenous and exogenous factors that lead to the co-location behavior of firms (Maskell and Malmberg, 2007). Cluster emergence is characterized by few companies and synergies (Menzel and Fornahl, 2010). In this way, there are two possible paths at this stage, the first is to lose strength and not become a cluster. The second line is to develop to the point of entering the growth stage (Martin and Sunley, 2011).

Two main approaches on cluster emergence can be distinguished (Isaksen, 2016). The first one suggests that new clusters often start in a certain place relatively by chance (Maskell and Malmberg, 2007). In the same view, Krugman (1991) brings to its cause, the seemingly trivial historical accidents. The second approach, however, advocates that clusters emergence is related to previously developed local capabilities, routines, and institutions (Boschma and Frenken, 2011).

In this context, some authors seek a middle ground between these two approaches to cluster emergence (Isaksen, 2016; Brenner and Mühlig, 2007). Isaksen (2016) recognizes the importance of preexisting regional conditions that allow the evolution of specific clusters in some places, while emphasizing triggers that bring up clusters in some specific places. In fact, for a successful experience of clustering, it takes a bit of luck in relation to the choices of agglomeration of firms and political actors that will fill the gaps of economic development (Siddivò and De Chiara, 2012). Thus, the actors involved in a cluster emergence play a vital role, given that they must be able to use favorable preconditions (Henning *et al.*, 2013), local triggers and the policy framework, and should put into practice regional strategies for the cluster, promoting actions that improve collaboration between actors and the adjustment of national and regional policies (Yoon, 2017).

Cluster emergence is difficult to detect because there are few synergies among the actions performed and, often, if it loses force, it does not become a cluster. Thus, it is necessary to understand how to articulate all the movements to potentialize and guarantee the process of cluster emergence. Next section will discuss the ability to orchestrate networks as an alternative to accomplish that.

2.3 Network orchestration

Orchestration capacity emerges as a set of activities aimed at the development, management and coordination of a set of actors that seek to create and extract value from the network (Dhanaraj and Parkhe, 2006). Fung *et al.* (2008) consider orchestration as the capacity to unite several different expertises for a harmony capable of creating value. Silva (2016) compares the function of the orchestrator with the conductor in an orchestra, where there may be exceptional musicians, but someone is needed to connect them and make them share the same vision.

In environments in which there is a high diversity of partners, that is, in networks and clusters, an orchestrator is needed to secure valuable inputs and mitigate concerns from network actors. Different network roles – which refer to the orchestrator doing specific orchestration activities in a specific way – should be explored in the cluster emergence process.

Innovation networks orchestration involves three dimensions: knowledge mobility, innovation appropriability and network stability (Dhanaraj and Parkhe, 2006). Knowledge mobility refers to the sharing, acquisition and deployment of knowledge within the network. Innovation appropriability ensures that innovators can capture the results generated by innovations, and network stability refers to the intentionality of maintaining collaboration among network members.

Based on Dhanaraj and Parkhe (2006), Hurmelinna-Laukkanen *et al.* (2011) add more dimensions and propose six of them as the basis for orchestration in innovation networks: agenda setting, mobilization, network stabilization, creation and transfer of knowledge, innovation ownership and coordination. Combining the dimensions proposed by Dhanaraj and Parkhe (2006) with the proposals by Hurmelinna-Laukkanen *et al.* (2011), six dimensions are recognizable (agenda definition, mobilization, knowledge mobility management, innovation appropriability management, network stability management and coordination).

2.4 Framework

Clusters stand out as mechanisms of innovation and development to firms and regions (Porter, 1998; Schmitz, 1999). However, their emerging process still generates discussion and uncertainty. In this sense, orchestration emerges as a capacity to capture, extract and generate value for the cluster, guaranteeing its existence and sustainable competitive advantage.

Facing a new social and economic scenario, Engel and del-Palacio (2009) and Engel (2015) update the concept of cluster for “CoI”. Such a definition maintains the idea of agglomerations of organizations in a geographical delimitation, but it places a multisectoral perspective and reinforces the heterogeneity of components as factors of innovation generation.

The cluster emergence process is complex and still little explored; it is believed to encompass a set of local prerequisites coupled with triggering factors (Brenner and Mühlig, 2007; Isaksen, 2016). This study seeks to define the drivers for emergence of innovation clusters.

The first drive, mobilization (Hurmelinna-Laukkanen *et al.*, 2011), is to search and select members to integrate the innovation cluster. Next, it is necessary to define an agenda

(Hurmelinna-Laukkanen *et al.*, 2011) to create and communicate a set of actions to provide direction and guidance to the innovation cluster members. Then it is possible to mobilize resources (Engel, 2015), share, acquire and implement physical, human and financial knowledge and resources within a cluster. Entrepreneurial process and global strategy perspective (Engel and del-Palacio, 2009; Engel, 2015) are fundamental drivers for guaranteeing the survival of the innovation cluster and its value generation.

How actors take part in the cluster is fundamental since it is their role to form the cluster (Henning *et al.*, 2013). The need for heterogeneity of network components such as local government, universities, entrepreneurs and society to generate innovation is also highlighted in the literature (Porter, 1998; Engel, 2015). Orchestration emerges as the alternative to articulate these different actors in the emergence of an innovation cluster.

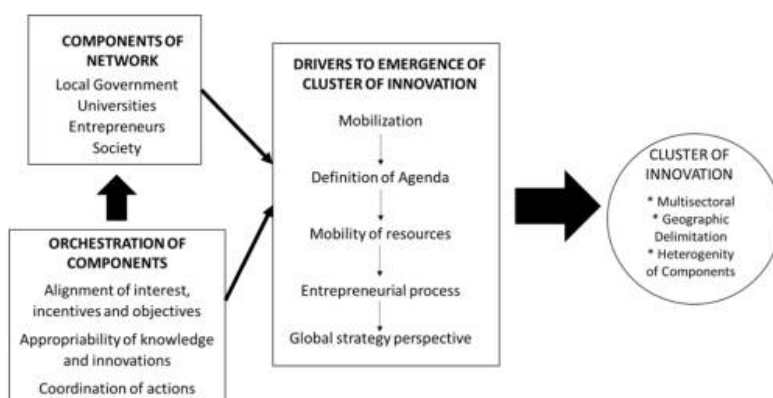
The following set of components for orchestration was defined based on the studies about emergence process of a CoI. First step is the alignment of interest, incentives and objectives (Engel, 2015), the capacity of stakeholders to ensure a collective strategy for the cluster. Next comes the appropriability of knowledge and innovation (Dhanaraj and Parkhe, 2006) that allows knowledge to be created and transferred and transformed into innovation. Finally, it is necessary to coordinate (Hurmelinna-Laukkanen *et al.*, 2011), conduct planning and control the execution of actions.

The following framework (Figure 1) helps to understand how the orchestration of the emergence process occurs in a CoI. It summarizes articulation between orchestration components and network components. Then, they can leverage the emergence drivers for the formation of the innovation cluster.

3. Research design

To answer *RQ1*, a single case study was used as a method, as it is a research strategy which focuses on understanding the dynamics present within single settings (Eisenhardt, 1989). This approach is appropriate because more in depth understanding of orchestration itself – and understanding of multi-sided contextual influences – is needed (Yin, 2003).

Single-case studies can richly describe the existence of a phenomenon (Siggelkow, 2007), theoretical sampling of single cases is straight forward. They are chosen because they are unusually revelatory, extreme exemplars or opportunities for unusual research access (Yin, 1994).



Source: The authors

Figure 1. Framework

The research strategy was a case study in 4th District, because of its trajectory as a CoI in emergency. In this way, the present case is suitable to analyze the orchestration process in the emergence of a CoI.

The 4th District, region located in Porto Alegre (in southern Brazil), is characterized by an old industrial zone profile that faced abandonment by large companies and the up surge of serious social problems. In recent years, an intersectoral and multidisciplinary movement arose, involving public bodies, universities, companies and various society actors, intending to develop the region and promote innovation. The formation of the multisectoral cluster has been occurring in an organic and decentralized way, which makes the case relevant to understand how it is orchestrated.

3.1 Data collection

Data were collected through documentary research, non-participant observation in cluster meetings and organizations located in the cluster and face-to-face in-depth interviews with actors involved in the cluster formation. Documents, academic research, reports and action plans related to initiatives for 4th District were used as sources of information. The interviews and observations were based on the orchestration dimensions of innovation networks previously defined in the literature by [Dhanaraj and Parkhe \(2006\)](#) and [Hurmelinna-Laukkanen et al. \(2011\)](#).

The observations occurred from June to July 2016 in events promoted by ZISPOA, Vila Flores, Collaborative Houses, UFRGS. In addition, ten interviews were recorded for later transcription and analysis. Given the exploratory profile of this study and the lack of studies linking orchestration to cluster emergence, this research used a limited number of interviews aiming to get stronger understanding on the subject and create hypothesis to guide future studies. This is not a new strategy in clusters studies. It has been used by [Porter et al. \(2013\)](#), [Shin and Hassink \(2011\)](#) and [Martin and Coenen \(2015\)](#). Interviews were about one hour long, and the profiles of interviewees are in [Table I](#).

Analysis of research data was made by paralleling the dimensions involved in the emergence of clusters of innovation described in literature (network and orchestration components and drivers to emergence of a CoI) with the development of the CoI in 4th District. [Table II](#) presents the three dimensions and their elements.

In addition, transcriptions of interviews and data obtained from documents and through direct observations were also compared to the elements listed above. Thus, the data triangulation strategy was used to identify the data consistency and validate evidences. Treatment of data was based on content analysis by [Miles and Huberman \(1994\)](#). The interviews were recorded under interviewees' previous consent.

Code of Interviewee	Component	Institution
Interviewee 1	Government	City Hall
Interviewee 2	Government	City Hall
Interviewee 3	Government	City Hall
Interviewee 4	Entrepreneur	Vila Flores
Interviewee 5	Local organization	ZISPOA/GUD
Interviewee 6	Entrepreneur	NósCoworking
Interviewee 7	Government	State Government
Interviewee 8	University	UFRGS
Interviewee 9	University	PUCRS
Interviewee 10	Local organization	Distrito C

Table I.
Profile of
interviewees

Dimensions	Elements	Authors
Network Components	Local government Universities Entrepreneurs Society	Engel and del-Palacio (2009), Engel (2015)
Orchestration components	Alignment of interest, incentives and objectives Appropriability of knowledge and innovations Coordination of actions	Dhanaraj and Parkhe (2006), Fung <i>et al.</i> (2008), Batterink <i>et al.</i> (2010), Engel and del-Palacio (2009), Engel (2015)
Drivers to emergence of a CoI	Mobilization Definition of agenda Mobility of resources Entrepreneurial process Global strategy perspective	Engel and del-Palacio (2009), Hurmelinna-Laukkanen <i>et al.</i> (2011), Engel (2015), Silva (2016)

Table II.
Dimensions and elements of analysis

4. Results

In the early 2000s, several initiatives sought to structure an electronic industry cluster in the region. However, the movement was interrupted because of the election of a new mayor who did not support it anymore (Interviewee 7). Years later, around 2012, civil society initiatives reopened discussions about projects to develop 4th District. Interviewee 6 states about the group of entrepreneurs and creative economy enthusiasts he has organized to bring solutions to the region: “we were passionate about the 4th District and uneasy about the current situation, so we were working collaboratively to come up with strategies to revitalize the region”.

Since then, residents and local entrepreneurs began to articulate in a collaborative way to recover this area. Besides the enterprises, the municipal government and local and international universities started to attend meetings. Taking the initiatives of civil society into consideration and having the Master Plan outlined, the city government began a mobilization in 2013 to transform 4th District into a CoI. The aim was to organize a network of multisectoral clusters: high technology, education, creative industries and health.

Working groups were organized encompassing several offices and public agencies, entrepreneurs, companies, organizations and universities. In early 2016, the city government signed a cooperation agreement with local and international universities. Then, the Master Plan for the region was better structured by researchers from a public local university and presented the strategic lines to develop 4th District. This project is still guiding actions for the CoI formation. According to Interviewee 1, “collaboration is a key element in this project that foresees the active participation of population since its conception”.

4.1 Network components

Engel and del-Palacio (2009) and Engel (2015) recognize CoI components as fundamental elements for geographic agglomeration. In 4th District, city government is an important component in this process. Within the local government, different departments and public agencies are involved in the project. The local government has structured two working groups to guide the actions in the region: strategic group and executive group.

The Executive Group encompasses departments of Finance, Urban Planning, Security, Governance and Tourism, EPTC – Public Enterprise of Traffic Control and InovaPoa – governmental Innovation Office. This group produced a diagnosis that identifies the most

relevant needs of the region. On the other hand, the Strategic Group includes the Finance and Governance Office, POA Digital, university, initiatives and entrepreneurs of the region, mobilized actors and established partnerships. “We are responsible for requesting the Master Plan, which will guide future action” says Interviewee 3.

Universities are actively participating in this revitalization process. UFRGS – Federal University of Rio Grande do Sul, PUCRS – Pontifical Catholic University of Rio Grande do Sul and URL – Universitat Ramon Llull, Barcelona, Spain are contributing with knowledge generation supporting the entrepreneurs and implanting offices of their technological parks in the region. UFRGS is involving seven laboratories and research centers on the structuring of the Master Plan. In addition, the University's School of Engineering and its Zenit Science Park are committed to building the innovation zone in the region. PUCRS is also mobilizing various sectors and academic units to contribute to the project. Among the actions, the School of Architecture and Urbanism has a research group located in the region. According to Interviewee 9, the idea came from his experience in Barcelona, where public spaces were used as learning laboratories. Funitec La Salle in Barcelona –URL is also a strategic partner to provide ideas and experience. The university participated actively in the case 22@ in Barcelona, a reference as CoI and urban regeneration. Thus, universities have the role of building and disseminating knowledge, fundamental to the emergence of a CoI. “The phenomenon that is occurring in the 4th District is unique, and it is up to the university to provide support for the construction of this project,” said Interviewee 8.

One of the main actors of a CoI pointed out by [Engel \(2015\)](#) is the entrepreneur. In 4th District case, the entrepreneurs were responsible for mobilizing and reconfiguring the territory. In 2012, meetings of entrepreneurs started in a coworking space of the region. Since then, the region began to count on numerous collaborative spaces that cover dozens of entrepreneurs from different areas. By the end of 2013, District C, a social innovation project, started the operation, which mapped and brought together entrepreneurs from the creative, knowledge and experience economy. According to Interviewee 10, a common objective was to join forces to transform the territory and consolidate a cluster of social innovation. At the same time, Vila Flores cultural center has been created. This center is an architectural complex with art and culture, education, entrepreneurship and urbanism as its guiding axes. Vila Flores involves about 20 entrepreneurs and hosts various events in the region. Interviewee 4 (Vila Flores founder) states that the initiative has a relevant social and economic role for the cluster formation: “we are a private, self-funded project that excels at sharing, aggregating collaborative work and diversity. There can be no urban revitalization with expulsion bias and social and cultural segregation”.

The society was also involved in the project of 4th District. ZISPOA – Sustainable Innovation Zone of Porto Alegre, which was founded by an American researcher, is formed by two hundred people. According to Interviewee 5, their aim is to make Porto Alegre the reference city for sustainable innovation in Latin America by 2020. They are divided into six groups to work that objective: innovation and technology, sustainability and resource efficiency, community participation management, entrepreneurship and startups, creativity and collaboration and business-friendly environment.

The Government of Porto Alegre created an office to attract resources for the city and to 4th District: Invest Poa. In 2015, Airbus and Medical Valley (Germany) were surveyed on a mission by the state government and the city hall. The French aircraft companies developing a proposal of a technology center and Medical Valley intend to install a technological and industrial complex dedicated to health research, in association with universities and research centers. The heterogeneity of components is fundamental for the construction of a multisectoral cluster. More than 20 operations in the health sector have

already been counted in the region, including hospitals, clinics, laboratories, pharmacies and health insurance. In information technology and communication area, the efforts involve Softsul-South-Riograndense Association for Software Development Support, Assespro-Association of Brazilian Information Technology Companies and Brazilian Electrical and Electronic Industry Association (ABINEE). Regarding education, actions are based on cooperation with universities in the region and contact with schools and educational institutions. Finally, the creativity area rests on the hands of the pioneers of whole process, District C, Vila Flores and other spaces linked to creative economy, art and culture. These evidences lead to the following research proposition:

- P1.* The emergence of a CoI in the urban regeneration context depends on the engagement of actors that contribute with different resources.

4.2 Orchestration of actors and resources

Because of heterogeneity of actors and the broad scope of this CoI, alignment of interest, incentives and objectives are becoming more complex. If heterogeneity is too high, the cluster candie because of lack of cohesion (Menzel and Fornahl, 2010). Interviewee 6 points out that different audiences impede an alignment of interests. “The government does not know what the investor wants, the university does not understand the needs of the local community and so on.” Interviewee 4 warns of the risk that region's valorization may cause the local community to be expelled because of increase in the cost of living. Interviewee 3 reports that one solution was the creation of working groups of different publics, however, it is noticeable that each working group is homogeneous and that there is no intergroup exchange. By aligning the interests of the actors involved, public policies could reduce the risk of cluster fragmentation (Tödtling and Trippl, 2005), which occurs when the high cluster heterogeneity makes it difficult to achieve the same critical mass (Menzel and Fornahl, 2010). In the case of the 4thDistrict, the alignment of interests, incentives and objectives is still very incipient and the components do not perceive a single identity of the agglomeration.

The appropriability of knowledge and innovations is related to identification, assimilation and exploitation of knowledge from the construction of weak ties, durable relations or even, covalent relations. This collective interaction and construction requires network stability to ensure that these links remain active and fortified. Ter Wal and Boschma (2011) argue that cluster links evolve with cluster capabilities. In the cluster initial stages, knowledge and technologies are tacit (Giuliani, 2005) and are strongly related to the human capital. Thus, this technological regime results in instability and volatility in the cluster networks (Ter Wal and Boschma, 2011). For emergence of a CoI in 4th District, it is essential to encourage knowledge exchange among the actors to disseminate best practices, allowing the emergence of a dominant design and cluster externalities (Tödtling and Trippl, 2005; Menzel and Fornahl, 2010).

Actors in 4th District do not know the other CoI components' potentialities and limitations. This context reduces the appropriability of knowledge and innovations in the region. One of the possible causes of this situation may be the low level of network stability. It is perceivable that though there are pride and willingness to participate in the formation of the CoI, the 4th District agglomeration has no single identity. Various initiatives generate knowledge and experience, but one does not see them in totality. As solution, Interviewee 5 is organizing a survey about all the actions developed in the region. The results will be published and shared with all actors involved in the project.

Concerning coordination of actions, there is also a strong decentralization in 4th District. The initiative to create the Strategic and Executive Working Group has a strong political influence and a limited result in terms of practical actions. When questioned about this issue, Interviewee 1 states that the cluster is too immature for governance, which he believes that may emerge over time. Interviewee 4 says: “that lack of local leadership can be a risk to the emergence of this cluster”. Based on these evidences the second research proposition is:

P2. Coordination of actions fosters the alignment among the actors and stimulates the emergence of CoI.

4.3 Drivers to emergence of cluster of innovation

Besides to identifying the network components in a CoI, it is necessary to analyze the roles that drivers play in the emergence of a CoI. Related to mobilization, exchanges and interactions among actors occur in more informal and organic way. Mobilization can be even more potentiated if there is greater interaction among the different actors. However, some activities in 4th District are happening in an isolated component or only between peers. So, a solution could be to share the definition of agenda and propose collective actions. The importance of this driver can be observed in meetings organized by either the city hall, or the collaborative spaces or ZISPOA. However, Interviewee 4 understands that actions in 4th District are still disjointed because there is no joint agenda aligned with specific goals. For example, on the District C website, one can find academic papers and reports, but only involving that initiative. Coordination of components could conduct planning and control the execution of actions by components, while the joint agenda creates routines to provide direction and guidance to cluster members.

The mobility of resources is easily verified in 4th District, because of the number of actors and initiatives that provide for exchanges and interactions among them. Such mobility is enhanced by the creation and dissemination of knowledge mainly by universities and entrepreneurs from academic research, networking meetings and training. However, these actions occur organically and in a disorganized way, which could be related to the lack of alignment of objectives and collective strategy. In addition, the links among the actors are still evolving, which directly affects the network stability. There are evidences that the cluster emergence is a consequence of the mobility of resources, such as intellectual capital, which has been increasing the participation of different actors. “The number of people attending our meetings has been increasing exponentially,” says Interviewee 1. The role of entrepreneurs and society is fundamental to community engagement. In addition, the city government is protagonist in the search for strategic partners and financial resources. Finally, the universities and the collaborative spaces have been disseminating knowledge.

Another driver is the entrepreneurial process. The area of 4th District, abandoned by the industries, started a slow movement of urban regeneration from large empty areas to creation of new companies. On supporting these initiatives, it is important to highlight the role of the collaborative spaces and the coworking offices installed in the region. “Many companies have emerged from exchanges and interactions here at Vila Flores,” says Interviewee 4. The mobility of resources and entrepreneurial process are quite remarkable in 4th District. Coworking spaces, collaborative houses and technological parks linked to the agglomeration promote the generation of innovations and new business.

Although the initiative is local, 4th District is already structured with a global strategy perspective. Besides URL, from Barcelona, contacts with French and German companies reinforce the intention to internationalize the region. Also, the participation of an American scholar and his global organization shows that the cluster already has visibility in other countries. “We believe that 4th District of Porto Alegre will serve as an example not only for

other spaces in the city, but also for different countries”, says Interviewee 2. Interviewee 5 also complements that the space is already a reference since the initiative was awarded in Sweden as an international case of innovative local development. In addition, the health cluster that will be structured in the region is the result of a partnership with Medical Valley.

As presented, there are evidences that there is a global strategy perspective, that is, 4th District presents interaction at local, national and global levels. This interaction can happen when the orchestration ensures mobilization, hence seeks and attracts new partners to enhance the cluster competitive advantage. The area has three strong international partners: an American scholar, a Spanish University and the German Government. In sum, the global strategy perspective enables a wide mobilization to capture partners and knowledge. These evidences lead to the third research proposition:

- P3.* The joint definition and communication of common agenda enable the development of an identity as CoI.

5. Conclusions and further research

In current dynamic and competitive scenario, networks and agglomerations appear as the main alternative to innovate and stand out in the market. There is a shift from enterprise-centered innovation to network-centric innovation (Nambisan and Sawhney, 2011). Clusters are revealed to be an efficient form of economic organization (Lorenzen, 2005), however the advantages found within clusters come from the collective action and not from the individual action of a particular firm (Schmitz, 1999). Yet, the ways in which these agglomerations are emerged is still generating a lot of discussion and questioning (Isaksen, 2016; Brenner and Mühlig, 2007). Therefore, the orchestration of networks appears as an alternative to articulate the preexisting characteristics of the region with factors that trigger agglomeration and innovation.

To answer *RQ1*, a qualitative exploratory research was carried out in Porto Alegre (Brazil), in a region known as 4th District.

The first contribution herein is the proposal of an analytical framework to understand how orchestration occurs in the emergence process of a CoI. Based on the literature review, this study presents the set of orchestration components (alignment of interest, incentives and objectives, coordination of actions) and the actors of a CoI (local government, universities, entrepreneurs and society). These actors can generate the drivers for the emergence of a CoI (mobilization, mobility of resources, entrepreneurial process and global strategy perspective) and the necessary elements for the emergence of a CoI (geographical delimitation and component heterogeneity).

Based on the research framework, this paper analyzes the case of 4th District, which becomes especially interesting because of its complexity and trajectory. The historical analysis revealed that after the exit of large industries that have been installed in the region, it started a long period of declining and abandonment. However, 4th District drew attention of political authorities, entrepreneurs and social scientists because of the emergence of new sectors working collaboratively. In this sense, 4thDistrict is an example of a region that, after a period of crisis, has been able to develop new trajectories of growth. It has been increasing its resilience by exploring new niches and emerging economic sectors (Martin and Sunley, 2011; Porter *et al.*, 2013). *P1* shows that the emergence of CoI in the urban regeneration depends on the interaction of different components. It was identified that the first step towards the emergence of an innovation cluster is the engagement of different actors. Each actor has a given knowledge that, together with others, enables to generate innovation in an agglomeration. *P2* argues that coordination of actions is easier when it is aligned among the components and stimulates the emergence of a CoI. The actors need guiding points; thus, the coordination of actions facilitates an alignment among them and, consequently, greater

interaction and generation of innovation. *P3* shows that joint definition and communication of common agenda enable the development of an identity as a CoI. In the same line as the *P2*, it was verified the need for an identity for the CoI that begins to be constructed from a joint definition and communication of common agenda.

In sum, *P1* brings points in relation to the cluster actors, the importance of an alignment among them, the possible difficulty related to heterogeneity and the need to disseminate information and interaction for appropriability of knowledge and innovation. *P2* and *P3* place the coordination of actions and joint actions as facilitators for the construction of a cluster identity.

Finally, this study brings a theoretical and managerial contribution to the application of the orchestration concept to create a CoI, thus promoting a discussion about the emergence of this type of cluster and ways of maximizing the positive externalities that it generates. One limitation was the use of a single case. Therefore, it would be important that future studies analyze more cases and gather more data from different sources. The theme would be greatly benefited by researches using quantitative tools to consolidate the findings.

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