

**CLUSTER GOVERNANCE, KNOWLEDGE MANAGEMENT
AND AMBIDEXTERITY**

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Note de Recherche n° 11-04 Mars 2011

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Abstract

This research is based on the premise that cluster governance is in charge of managing the tension between exploration and exploitation knowledge at the collective level. Since the creation of “competitiveness poles” in France in 2005, there is a growing literature on clusters, especially on the role of cluster governance (Bardet et al., 2009; Bocquet and Mothe, 2009a, 2009b). However, the role of governance in terms of knowledge management remains under-explored. Bocquet and Mothe (2010) have shown the significant role it can play on all three phases of the integration process of external knowledge (identification, acquisition, utilization) but without specifying the nature of information created or operated within clusters. In line with this work, our goal is to identify how governance is able to achieve some ambidexterity at the cluster level in terms of knowledge produced and disseminated.

Our methodological approach is based on 29 interviews conducted between January 2008 and March 2009 on the two competitiveness poles Arve-Industries and Imaginove, both located in the Rhône-Alpes region. Our results highlight the fact that the action of governance is partly determined by structural factors (type of industry, lifecycle of the industry, context of the cluster emergence, etc.) and by

related business characteristics of cluster members - who are mostly SMEs (such as size, type of leader, innovation capabilities and absorptive capabilities, openness, ability to change culture, etc.). However, governance has a significant influence on cluster ambidexterity in terms of knowledge - which can take two different forms. These results have important managerial implications for the governance of SME’ clusters and public policy implications.

Keywords: Ambidexterity, Exploration/exploitation, Governance, Innovation, Knowledge

Introduction

The conceptual distinction between exploration and exploitation has been applied to a number of fields outside organizational learning since March's pioneering article (1991), such as strategic management (e.g., Winter and Szulanski 2001), organization theory (e.g., Gibson and Birkinshaw, 2004; Gupta et al., 2006), interfirm cooperation (e.g., Rothaermel and Deeds, 2004) and innovation management (e.g., He and Wong, 2004; Jansen et al., 2005; O'Reilly and Tushman, 2004; Smith and Tushman, 2005). Exploration and exploitation involve learning of different degrees and types (Gupta et al., 2006), and the conceptual distinction between these two concepts has had a profound impact on research.

We focus here on one aspect of learning, that pertaining to knowledge for innovation. In the recent literature on innovation, there seems to be a consensus that firms should develop the capacity to explore new technological paths, while continuing to exploit their existing competences (e.g., Levinthal and March, 1993; March, 1991; O'Reilly and Tushman, 2004; Tushman and O'Reilly, 1996). An appropriate balance between these two activities is seen as necessary for a firm to be both competitive in mature markets - where costs, efficiency and

incremental innovations are critical - and, at the same time, to be innovative in terms of product development for emerging markets - where experimentation and flexibility are needed (Tushman and O'Reilly, 1996). The capacity to simultaneously pursue these two contradictory objectives (Brion *et al.*, 2008; Chanal and Mothe, 2005; Smith and Tushman, 2005; Mothe and Brion, 2008) is called ambidexterity.

Although there is a growing literature on ambidexterity at the organizational level, no study, at our knowledge, has been carried on ambidexterity at a more macro level, that of a cluster, and, more specifically, on how to foster ambidexterity in a cluster. Previous research has resulted in a number of conflicting perspectives on how to simultaneously separate and integrate exploratory and exploitative activities at the firm level. And the cluster literature has not focused on the role cluster governance may play in knowledge management, especially in the case of SMEs. Some studies have validated the ambidexterity hypothesis in the case of small firms (Bierly and Daly, 2001; Lubatkin et al., 2006), even though other authors (in line with March, 1991) point out the difficulties of reaching ambidexterity, especially for small firms which have to make tradeoffs due to their

limited resources (Lin et al., 2007). For these SMEs, investigating how ambidexterity can be obtained externally through inter-organizational ties (Rothaermel, 2001) is of particular interest. Small firms in search of ambidexterity in order to increase innovation and future organizational performance could compensate for their lack of internal resources by developing relations with other organizations (research labs, start-ups, competitors, suppliers, clients, etc.). This “network” ambidexterity is the objective pursued by SME cluster governance.

This paper thus aims at bridging these three fields of research (knowledge management, cluster literature - and the knowledge based view of clusters, and ambidexterity) by analyzing the role of SME cluster governance in knowledge management in order to achieve ambidexterity to support innovation. In the first section, we draw from the recent literature on ambidexterity so as to clarify the role of cluster governance in the management of knowledge to support knowledge management and ambidexterity. We then present the empirical qualitative research methodology and the two cases of SME clusters on knowledge management, focusing on how governance manages to reach ambidexterity at the cluster level. In the

last section, we discuss the main theoretical and managerial implications of our results, especially for policy-makers and cluster governance actors, and propose some avenues for future research.

1. Knowledge, ambidexterity and the role of cluster governance

1.1. Knowledge and ambidexterity

Finding the right balance between exploration and exploitation is complicated but essential for organizational learning and survival (March, 1991). The question of whether exploration and exploitation activities are antithetical or complementary has not yet been solved. In the management and organization literature, ambidexterity is defined as the synchronous pursuit of both exploration and exploitation (Gupta et al., 2006). However, ambidexterity is not the only possible way of achieving this balance. As exploration and exploitation compete for the same resources and attention in an organization, they can be viewed as two ends of the same continuum, thus arguing in favor of a punctuated equilibrium (Gupta et al., 2006). Evidently, it is difficult to imagine how an organization can combine efficiency in managing current activities and efficacy in experimentation and risk management, as

they are based on distinct competences and organizational capabilities (Benner and Tushman, 2003). For firms, the contradictory imperatives of short-term survival through the efficient employment of current assets and capabilities, and long-term success through the development of novel capabilities have even been viewed as paradoxical (Gilsing and Nooteboom, 2006). Besides, there is still no consensus as to how exploration and exploitation should be combined at the organizational level. Some researchers advocate combining organizational and managerial solutions, that is to say, structural ambidexterity (O'Reilly and Tushman, 2004). This can be achieved by the structural separation of exploration and exploitation activities, which nevertheless must be integrated by senior management (Benner and Tushman, 2003; O'Reilly and Tushman, 2004). Consequently, ambidextrous organizations need managers who understand different kinds of businesses and their needs, and who are capable of being *“rigorous cost cutters and free-thinking entrepreneurs while maintaining the objectivity required to make difficult trade-offs”* (O'Reilly and Tushman, 2004: 81). Recently, Gibson and Birkinshaw (2004) argued that contextual ambidexterity might best be achieved through individuals – who are considered to know best how to divide their time

between the two conflicting activities. This idea challenges traditional and ingrained opinions on the difficulties human beings have in devoting their time and energy to paradoxical objectives, such as the tradeoff between efficiency and flexibility (Adler et al., 1999). Contextual ambidexterity is defined as the individual behavioral capacity to demonstrate both alignment and adaptability (Gibson and Birkinshaw, 2004). This ambidexterity depends on the systems, incentives and processes that shape individual behaviors in an organization.

Going beyond the differences between organizational structural and contextual ambidexterity, we here analyze ambidexterity at a more macro level, that of a cluster, and how cluster governance may achieve knowledge ambidexterity, i.e. on the processes, systems and incentives governance implements in order to make the cluster operate ambidextrously and the underlying necessary knowledge. Governance should overcome potential problems caused by contradictory cluster alignments (Ghoshal and Bartlett, 1994; Smith and Tushman, 2005). When resolving the exploration/exploitation dilemma, cluster governance has the difficult task of implementing the most appropriate practices in order to achieve ambidexterity through appropriate knowledge management for innovation and

performance. Cluster governance plays a crucial role in developing ambidexterity as, on the one hand, it develops objectives, goals, methods, processes and procedures that enhance exploitation knowledge and, on the other hand, it identifies favorable opportunities for new technological or marketing knowledge, thus favoring exploration activities (Teece, 2006). The wide diversity of members (private and public players) is a well-identified obstacle for knowledge management within industrial clusters (Alberti, 2001). As a consequence, knowledge in clusters needs to be “governed”, especially in the case of small firms’ clusters.

1.2. Cluster governance

Governance is defined as “*the intended, collective actions of cluster players in view of upgrading a cluster*” (Gilsing, 2000: 7). In that sense, governance appears to be as important as geographical proximity when knowledge diffusion and creation are at stake – possibly even more important (Alberti, 2001). In the same vein, studying the creation and categorization of knowledge management in automotive components SMEs in India, Pillania (2008: 1460) concluded that “*government and industry associations play an important role in creating the eco-system for new knowledge creation among SMEs*”. Other

works have shown that governance cannot be effective without a full understanding of the specific context (corporate strategies, industrial structures, profit cycles, state priorities etc.) in which the firms are embedded (Markussen, 1996). As Platt and Wilson (1999) point out, it is not merely a question of having the ‘learning architecture’ in place, but also of having the ability to use it - which varies across socio-cultural contexts.

In 2005, the French Government set up a new public policy for regional planning and development based on the creation of “Competitiveness Poles”. French poles are defined as the grouping of firms, research labs and education institutions established on a given territory and involved in a collaborative approach aimed at creating synergies around innovative collective projects oriented towards one or several given market(s). This definition emphasises the role played by geographical proximity, offering easier access to information, fostering knowledge exchange and facilitating the diffusion of innovations. However, a recent strand of literature shows that geographical proximity is not sufficient to facilitate knowledge creation and diffusion: “*spillovers do not flow freely in the atmosphere. They can only be absorbed once communication protocols have been established*” (Antonelli, 2006: 253). Thus,

interactions organized at the cluster governance level may be necessary in order for firms to interact and for knowledge processes to occur. Accordingly, Steiner and Hartmann (2006) highlight “*the importance of institutions that favour and support conscious effort in knowledge exchange*” within clusters (ibid: 503) and advocate for more research on “*the nature of institutions that would allow for greater emphasis on process creation and sharing*” (ibid: 504).

Although it is fundamental, the role of governance has been neglected in the cluster literature, which rarely addresses governance involvement in knowledge management, or on how different types of knowledge and ambidexterity can be created at the cluster level. Following the emergent knowledge-based view of clusters (Bahlmann and Huysman, 2008), we consider that managing knowledge in clusters requires a solid understanding of how governance can facilitate knowledge ambidexterity at the inter-organizational level (Grant, 1996; Kraaijenbrink and Wijnhoven, 2008). The present research is thus anchored in a knowledge-based perspective that considers innovation as being based on new knowledge development and acquisition processes (Nonaka and Takeuchi, 1995). From that perspective, a cluster is viewed as “*a well-designed engine for information*

processing, but more importantly, it assiduously becomes a context in which knowledge — the engine’s fuel — is created » (Nonaka et al., 2006: 1186). Due to various obstacles and to the complexity of the process itself, localized knowledge interactions between players cannot be considered to be spontaneous. The objective is to identify the way different types of knowledge underlying exploration and exploitation can be integrated through actions taken by the governance in order to create ambidexterity at the cluster level.

The main difficulty comes from the fact that clusters are composed of various organizations and individuals that can not be reduced to a focal organization. When moving from the intra- to the inter-organizational level, the question is not only to know how governance can help the players to manage knowledge heterogeneity within organizational boundaries (intra-organizational heterogeneity). Due to the external nature of knowledge, firms have to deal with two additional levels of knowledge heterogeneity, “extra-organizational” and “inter-organizational” (Kraaijenbrink and Wijnhoven, 2008). In that respect, the challenge for governance becomes twofold: Firstly, it must help firms to distinguish between relevant and irrelevant knowledge (“extra-organizational heterogeneity of knowledge”). Secondly, it

should help these firms to bridge the differences (essentially of cognitive nature) between their organization and the sources of knowledge in order to make such knowledge usable (“inter-organizational heterogeneity of knowledge”).

Surprisingly, few empirical works have addressed the manner in which cluster governance supports knowledge processes and ambidexterity and, more specifically, how this is achieved within clusters that are composed of SMEs (Cappellin, 2003). Along the same line, Bahlmann and Huysman (2008) recommend to identify the role of cluster governance with respect to knowledge. More generally, research on knowledge management in SMEs remains scarce (McAdam and Reid, 2001; Liao et al., 2003; Davenport, 2005) even though such firms are critically short in new knowledge creation (Pillania, 2008). Our objective is to shed light on this issue, focusing on small firms as these are faced with specific obstacles that may prevent or hinder knowledge identification, acquisition and utilization (Thorpe et al., 2005; Pillania, 2008), and especially the knowledge underlying exploration activities, which are often more difficult to carry out for SMEs.

The present research was thus designed to further our understanding of how cluster governance can manage knowledge in order to reach ambidexterity

at the cluster level. This could be achieved by allowing some firms to pursue flexibility and the search for new knowledge and, for other firms, efficiency and the use of existing knowledge (Levinthal and March, 1993). However, according to the ambidexterity literature, firms should simultaneously pursue exploration and exploitation activities. Thus, the question of how governance knowledge practices should favor short-term efficiency as well as long-term discovery remains open. Ambidexterity at the cluster level presents undeniable benefits. It could be achieved through 1. specializing firms on exploration and exploitation activities and the development of inter-organizational relationships (according to the knowledge management literature) or 2. pushing each cluster firm to reach organizational ambidexterity by providing it the complementary knowledge (according to the ambidexterity literature). The type of ambidexterity pursued by governance and how this latter manages knowledge processes in order to reach it is analyzed in the empirical study.

2. Research methodology and two cases of ambidexterity knowledge management

We analyze two “competitiveness poles” (from here on, clusters), Arve-Industries

and Imaginove, both composed mainly of SMEs located in the French Rhône-Alpes region. These two cases were selected because they share common characteristics (composed mainly of SMEs, located in the same region) but also because they differ significantly in terms of historical background (long tradition for Arve-Industries, short history for Imaginove), culture and leadership profiles (secrecy and tradition, openness and modern), type of industry (metal-working industry, cultural industry), position in the value chain (subcontractors, mainly for the automobile industry, and editors/distributors/producers), degree of heterogeneity and of competition among member firms (high competition between similar actors, low competition between heterogeneous).

After introducing the two cluster structures, we identify the knowledge ambidexterity processes implemented by their respective governances. The research methodology is based on two case studies and 29 interviews conducted between January 2008 and March 2009 with governance players. For Arve-Industries, all members of the executive committee were interviewed (7 persons) as well as 7 members of the Executive Board and the Administration Council and 5 project managers. For Imaginove, we conducted 10 interviews with the director and all the

Board members. This qualitative research was based on semi-structured face-to-face interviews lasting two hours on average. All question items addressing the external knowledge integration phases (including the types of knowledge) were based on the empirical and theoretical literature (e.g., Nonaka, 1994; Lazaric et al., 2008; Martinde-Castro et al., 2008). The interviews were transcribed and validated by all the respondents. They were then coded according to the main themes identified in the knowledge-based perspective of clusters: emergence of the cluster, features, governance structures and roles, knowledge management processes, type of knowledge: exploitation/exploration. Secondary data was also used for data triangulation: press extracts, government websites, articles and scientific communications at conferences, innovation and cluster observatories. A triangulation of primary and secondary data was performed in order to highlight cluster characteristics and its operational functioning.

This methodology is unique and differs from previous studies which largely ignore intermediaries, i.e. governance players. The large number of interviews conducted enabled us to limit the classical potential bias related to this type of method, based on players' perceptions and representations. It also presented the

advantage of controlling whether the different governance actors shared a common vision in terms of type of knowledge managed within the cluster.

Case A: Arve-Industries

Arve-Industries Haute-Savoie Mont-Blanc is composed (as of March 25, 2011) of 274 member companies (90% SMEs), 28 public laboratories, 30 private laboratories, 12 technical training centers, 25 institutional and territorial actors (including 10 municipalities). The companies are located in the *Technic Valley* industrial district, a territory with 800 SMEs involved in metal-working subcontracting. The Valley groups many businesses and skills: cutting, precision mechanics, assembly, materials surface treatment, precision grinding.

The cluster was established at the initiative of politicians from the department of Haute-Savoie in order to create a new dynamic for the old *Technic Valley* industrial district. In particular, the objective is to help subcontracting firms to develop new organizational forms and new competencies in order to design more complex products, including mechatronics products - based on the integration of mechanics, electronics and computing. The cluster is in line with a pre-existing territorial logic (centered on the industrial district) characterized by strong local roots,

a legacy of private industry and initiatives, and a culture of secrecy. Everyone knows each other but there are different communities of practice that do not mix together. In such communities, the tacit nature of knowledge is facilitated by face-to-face contacts. Although the former industrial district has succeeded in pooling resources around a local platform, it did not lead to bridge the different communities of practice. Subcontracting firms remain very specialized and have an interest in protecting their specific technical know-how. Hence, they can intentionally raise boundaries that prevent knowledge to flow to others, especially by secrecy. For the governance itself, confidentiality is an important dimension. Being a small sized cluster, it develops specialized research, and has to protect itself from imitators. At the cluster level, the governance admits that the risk of imitation is quite low. Governance acts in the area of overlapping communities of practices. This role is mainly orchestrated by local public institutions, which are key players within the governance. Most of them are delegated by their respective institution, except for two permanent employees (secretary and communication assistant).

To increase the firms' value creation, the cluster governance insists on the role it plays in the identification of

external scientific and technological knowledge, as screening and technological watch is essential to gain new knowledge to explore the future of the mechatronics activity:

“We help companies to move towards another type of subcontracting which incorporates research and innovation (...). We engage in applied research for the welfare of companies” (governance member and program pilot, University Vice-President, 03-2008)

However, a distinction has to be made between the “average” SMEs and the cluster “engines”, which are able to perceive opportunities and benefits from external exploration knowledge. As such, these “leading firms” have already built their own networks, often distant and international. For them, the cluster plays a screening role and can lead to new connections through the Technical Center for Cutting and Mechatronics (CTDEC), the innovation centre (Thésame) or the University. Until now, the cluster governance has privileged the identification of scientific and technological knowledge to respond to the new requirements of the major contractors. However, essential technological knowledge is not sufficient to counteract low cost competitors from developing countries, and to lessen the high dependence towards some automobile constructors or equipment manufacturers.

Aware of these challenges, the governance also seeks to broaden the firms’ external knowledge spectrum by identifying relevant organizational and managerial knowledge for subcontracting SMEs. But, as mentioned by governance members, SMEs are not in this perspective, mainly because short-term imperatives still prevail. These SMEs are essentially focused on exploitation activities, and the governance is trying to identify knowledge that could underlie exploration activities that are essential to reposition SMEs in the precision mechanics into mechatronics - thus including electronic and computer knowledge and competencies:

“When we are dealing with cutting or machining, it's quite easy to convince firms of the need to innovate. However, for programs covering business intelligence and mechatronics, it means something to some firms but not to others. Those who understand the challenge are the more internationally-oriented firms. They have already followed their contractor on foreign markets or they want to develop their sales on international markets” (governance member, in charge of technological watch and knowledge intelligence, Technical centre, 08-2008)

In order to foster the absorptive capacity of SMEs and their acquisition and utilization of external knowledge, the governance encourages collective innovation projects through various programmes in industrial performance, cutting, collaborative innovation, quality, etc. However, once

again, these programmes are mainly confined to the “engines”. The efficiency of such actions is somehow limited by the low motivation of a large number of SMEs. The governance is also active in setting up other types of schemes (collective and individual actions and training) designed to facilitate knowledge acquisition and utilization. Yet, for most firms, the main lever is essentially financial in nature, and quite artificial since there is no shared cognitive orientation:

“The cluster offers a range of tools at different levels: some companies participate in information seminars, other in collective actions. The most active ones are engaged in R&D projects. Only a few firms (the engines) have adopted a proactive strategy when they joined the cluster. If some small firms are more committed, there is still a great majority that behaves opportunistically, looking for financial support or cluster image” (governance member, Thésame, 02-2008).

Case B: Imaginove

Imaginove is composed (as of March 25, 2011) of two associations and, indirectly, of 107 firms (97% of SMEs) in the cultural industries, 5 research laboratories and 10 training centres/schools. Imaginove was created by three founders: Lyon Game (videogame association), Image Rhône-Alpes (audiovisual association) and CITIA (“Cité de l’image en mouvement d’Annecy”). Their members operate in the

video game, multimedia, audiovisual and image industries. The cluster is in line with a regional policy implemented in 2002 by the Rhône-Alpes region around a Digital Entertainment cluster and initially focused on video games. In July 2005, the regional cluster, named Imaginove, was labelled “competitiveness pole” and opened up to the image industry, following the motivation of the Region to create synergies between these industries. Today, Imaginove is both a regional cluster and a national “competitiveness pole”:

“The regional cluster focuses on industrial organization which is not a prerogative of the competitiveness pole. That is why (the cluster governance) has the advantage of not being active only in R&D activities; it also manages the whole ‘filière’!» (governance member, in charge of scientific valorisation, research centre and university professor, 06-2008)

Imaginove is active in creative and digital "content industries". There is no hardware or cabling. Member firms are small, even Atari and Ubisoft as their headquarters are established outside of the region. The main objective of the governance is to take into account the specificities of these SMEs that lack strategic vision in order to make them work together:

"With SMEs, there is a problem of temporality, the temporality of this month, with no strategic vision" (governance director, 03-2009)

« Innovation in SMEs requires managers who believe in it. It is a big investment. The point is to increase knowledge flows, to create a dialogue. It necessitates true collaboration» (governance member, in charge of scientific valorisation, research centre and university professor, 06-2008).

Players from the three industries (animation, video games and film production) get to know each other and initiate interactions. This was facilitated by the fact that the three founders are active in web communities and in the pre-existing professional associations. Coordination is ensured by a permanent team composed of the director and 6 employees who do not belong to the three associated industries. Cooperation between firms is mainly driven by this team:

« The animation team, as it has been designed, structured and formalized, has a real impact. It is important that the team members are permanent employees who all work in the same office. This fosters intense every day exchanges» (governance director, 06-2008)

Governance members are actively involved in the knowledge identification phase, helping firms to locate relevant external knowledge. The governance is very active, especially with regards to prospective, strategic screening (from the National Communication Council, the Region, the “Grand Lyon”, for calls for projects, etc.), and relations with the institutional partners that provide funding and potential

development. The cluster sees itself as a provider of “general” knowledge to member firms, which is clearly of exploitative nature:

«Governance should be able to diffuse general information that are strategic for SMEs’ growth but also more specific information to help some firms to start collaborative R&D projects» (governance director, 03-2009)

« In a near future, the objective is to develop links between firms by creating a private space, a shared knowledge base. Up to now, it costs too much energy to the animation team. The priority is to increase the turnover and expand commercial boundaries» (governance member, CITIA and University, 03-2009)

Here, the situation is somehow different than that of Arve-Industries, as most SME members of Imaginove are involved into exploration activities due to the very fast changing and moving industries (especially multimedia and videogames). This exploration is mainly based on the recombination of existing knowledge. Thus, firms do have a necessity to exploit more and to absorb the necessary underlying knowledge (the “generic” knowledge on human resources, marketing, commercial, managerial, etc.). This type of knowledge is seen as an essential base to support firms’ growth - which is a priority for the cluster. There are few needs oriented towards new scientific or technological knowledge, except for the video game industry:

“New knowledge gained through R&D programs is shared between project members but not diffused among other cluster members »
(governance director, 03-2009)

The animation sector does not need such knowledge, and the multimedia sector uses standard technical knowledge. Most firms are mainly interested in commercial and managerial knowledge (project management, production organization, etc.). The governance thus responds to their immediate short-term concerns, providing knowledge for exploitation.

However, by articulating existing knowledge and developing links between the three industries – also beyond the region, governance members indirectly contributes to the integration of new knowledge for firms. The main exploration therefore consists in absorbing existing knowledge from the other industries, especially useful for the creation of the so-called “cross media” products. Imaginove creates relations between knowledge, competences, spaces for transferring general knowledge, and identifies business gateways.

« To create opportunities for companies to meet, we link firms operating in the same activity and firms belonging to other industries (cross media) »
(governance member, CITIA, 06-2008).

Through various programmes and tools, the governance provides incentives for member firms to enhance their capacity of

projecting themselves in a longer term (2-year horizon). For instance, planning and holding of events is essential for members. The city of Lyon is known for its video game industry, Annecy for animation. SMEs expect the governance to be very active in the organization of such events, which are particularly important for the image of the entire industry. This also creates new opportunities for firms to meet each other in a transversal logic (cross-industry approach). Another example is related to the creation of a directory where the firms’ knowledge and competencies are detailed and available for consultation by all cluster members.

Although Imaginove governance faces similar problems as Arve-Industries related to members’ awareness and implication, it seems that it is better able to take into account their specificities, especially those linked to their activity. Firms operating in the audiovisual industry are interested in lobbying and financial subsidies. In the videogame industry, firms do not need help, they mainly do things on their own but they do have an interest in commercial development and promotion (reputation of the Region). The animation sector lies somewhere between the two, with an interest in the international positioning of the industry. The focus is clearly on creating the “foundations”, the prerequisites that will encourage member

firms' awareness and their involvement in collaborative projects, and on providing member firms 1) knowledge underlying exploitation activities (such as commercial and general knowledge), 2) knowledge underlying exploration activities, which mainly comes from knowledge existing in the other industries for the new generations of cross media products.

The governance is keen to set up learning pre-conditions through the creation of different spaces where members may interact in a transversal logic. Training and consulting, collective actions, follow-up meetings and project labelling are carried out by experts and consultants who are external to the governance. In this case, contrary to Arve-Industries, we observe a clear-cut distinction between the role of the Administration Council, which provides the major strategic orientations, and the "operational governance" (team of 6 employees plus the director), which creates the various actions related to employment and training, innovation and R&D, commercial and international, fairs and events, and communication.

3. Discussion and conclusion

These two cases show that the "pure" geographical proximity between nearby innovative firms is not a sufficient

condition in order to ensure that knowledge processes and ambidexterity will occur. In the case of SME clusters, the governance has a major role to play in *organizing* efficient local interactions between players but also in reaching ambidexterity at the cluster level. Past research has validated the ambidexterity hypothesis in the case of small firms (e.g. Lubatkin et al., 2006). But little has been said about "how" to manage underlying knowledge processes (Bocquet and Mothe, 2010).

An empirical study was thus undertaken to investigate the role of governance in the management of knowledge and ambidexterity in the two small firm clusters. Our study shows that the governances take two very distinct paths to reach this knowledge ambidexterity.

In Arve-Industries, most SMEs are focused on exploiting their deep knowledge in precise mechanics and are not geared towards the absorption of new knowledge, especially in electronics, for exploration activities that are necessary to make them evolve towards mechatronics. These SMEs, essentially subcontractors, have a long-lasting know-how and a deep industrial culture characterized by secrecy, low absorptive capacities and price-based competition. The task of Arve-Industries is difficult due to the high exploitation

orientation of most SMEs. Switching to a culture towards exploration and innovation is difficult for most of them – except for the largest ones. Faced with these difficulties to convince SMEs, the governance has adopted processes that allow for most firms to absorb generic technological and market knowledge, and has focused on the “SME engines” to enter into innovation networks for exploration. It thus focuses, on the first place, on reaching an ambidexterity at the cluster level, with some firms being able to explore and acquire the necessary technological and scientific underlying knowledge. This “constrained” specialization responds to the very nature of the Arve Valley firms, and the governance is keen to enhance their absorptive capacity. It helps some engines to build an ability to scan the market for emerging technologies, to absorb the technology acquired, and to perform complementary R&D activities. The concept of absorptive capacity is considered in a “restrictive” sense (circumscribed to R&D): Firms must have a sufficient R&D in-house capacity to integrate new knowledge that is necessary for them to compete in the mechatronics industry. In the opinion of governance members, the challenge is to help about 50 hub firms (about 20% of the cluster members) in order to guarantee the expected dynamics. These firms are

supposed to become the vectors of knowledge dissemination.

Instead, in Imaginove, most SMEs are young and oriented towards new ideas, innovation and exploration as multimedia markets are rapidly changing. This means that they have, at least, a “potential” absorptive capacity (Zahra and George, 2002; Lazaric et al., 2008) as they are always confronted to new knowledge. Moreover, as the Imaginove cluster has been created with the objective to link three different industries for cross media products, member firms are inclined to explore the knowledge that exists in the other industries and that could be integrated or recombined. Cluster governance, in order to foster this tendency towards exploration, pushes towards R&D projects between industries. However, it is much more focused on helping firms to exploit through providing them with generic knowledge on markets, human resources, commercial and managerial aspects. Imaginove adopts an input knowledge management strategy that appears to be well-adapted to the short-term needs of its members. This contributes to the creation of a common knowledge base. The priority is given on knowledge intelligence and knowledge dissemination between the three industries. Providing exploitative knowledge to most member firms, Imaginove fosters the

SMEs' absorptive capability by helping them to recognise the value of external information, assimilate it and apply it to commercial ends (Cohen and Levinthal, 1990). This absorptive capacity does not rely exclusively on R&D activities but also on qualified personnel (Mowery and Oxley, 1995). Hence, governance builds the pre-requisite conditions to help each firm to become ambidextrous. As a matter of fact, the main objective is not to develop new technological knowledge but managing cross relationships offers firms new opportunities for exploration. Imaginove has a double structural advantage over Arve-Industries: it gathers SMEs belonging to different industries and, at the same time, benefits from the vertical logic of the regional cluster and the horizontal logic of the pole. Governance has been very keen to find the right way to ambidexterity.

The major limitation of the present study is its static nature. Future research could study the effects of cluster lifecycle on knowledge management through longitudinal studies as the constraints and performance factors may differ (Bresnahan *et al.*, 2001). Also, linking cluster lifecycle to industry lifecycle could provide interesting insights to study their moderating influence on the relationship between geographic proximity and firm innovation. Knowledge management may

depend on the phase in the industry life cycle, which is rather different in our two cases: mature for Arve-Industries, emerging as far as cross-media is concerned within Imaginove. In this respect, our preliminary results reveal differences, especially concerning the type of knowledge that has to be acquired by member firms, and thus their level of ambidexterity.

Our results have far-reaching managerial implications, not only for firms engaged in cluster activities, but also for institutional cluster governance players and policy makers. We have identified two radically different modes of cluster governance, of managing knowledge, and of reaching ambidexterity at the cluster level – and their preconditions, i.e. member firms' common knowledge base and shared representations. As cluster governance is keen to enhance members' competitiveness and innovation performance, firms should become more aware of the advantages of belonging to a cluster. In the first place, governance should create common representations based on the specific industrial knowledge base. If firms are too close (geographically or in terms of activity) the main tasks should be to promote the advantages of co-opetition on one hand, and of developing outbound networks on the other hand. In the opposite case, when firms are distant, reinforcing

links within the cluster is a prerequisite for further governance actions. Cluster competitiveness does not rely on the aggregation of knowledge from individual firms, but rather on its re-combination through efficient interactions. The role of governance is then essential for creating and sustaining such interactions, especially in the case of small firms that are not able to perceive and/or capture strategic opportunities.

Evidently, closely-related problem of firms' absorptive capacity, largely studied in the literature since Cohen and Levinthal's (1990) landmark article, cannot

be ignored, as all governance efforts will remain vain for cluster members who lack absorptive capacity. This aspect has remained largely ignored as far as small firms are concerned. We hope future research will investigate further the analysis of knowledge management and ambidexterity in clusters, as these organizational forms, based on different types of proximity, are in constant development in our knowledge-based economies and as the necessity to both exploit and explore for firms has been confirmed by a growing number of studies.

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