

Innovation in the IT Sector :

Intermediary Organizations as a Knowledge Sharing Strategy?

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Article dans IJKBD: Tremblay, Diane-Gabrielle (2016) Innovation in the IT Sector : Intermediary Organizations as a Knowledge Sharing Strategy? *International Journal of Knowledge-Based Development* 7(4) . <http://www.inderscience.com/jhome.php?jcode=ijkbd>

Shortened abstract:

While traditional neoclassical economics view the individual entrepreneur as source of competitiveness, and the market economy as source of economic growth, it has recently been recognized that collective leadership and entrepreneurial activity are often at least as important. Also, knowledge has replaced physical capital as the main source of competitiveness and creation of a competitive advantage over other firms through networks and knowledge sharing. However, it is often unclear how this knowledge can be gained. Some authors contest the neoclassical individualistic view and consider that networks and industrial clusters can foster such knowledge exchanges. We hypothesized that the IT sector would be interested in collective ways of accessing knowledge, and sought to determine what modes of governance or intermediaries could make this happen. The paper analyzes these intermediaries and their contributions to the IT/multimedia/gaming sector in Montreal, the cluster policy which favors knowledge exchanges, the collective over the individual.

ABSTRACT

While the traditional neoclassical economics views the individual entrepreneur as source of competitiveness, and the market economy as source of success and economic growth, over recent years, it has been recognized that collective leadership and entrepreneurial activity are often at least as important. Also, knowledge and intellectual capital have replaced physical capital as the main source of competitiveness and creation of a competitive advantage over other firms through networks and knowledge sharing. While there has been quite a lot of research on the nature and the components of knowledge and intellectual capital, it is often unclear how this intellectual capital or knowledge can be gained. Some authors have put forward the idea that new collective modes of governance such as networks and industrial clusters can foster such knowledge exchanges, contributing to reduce the validity or importance of the neoclassical individualistic view. However research has not looked into the type of governance of organizations or intermediaries. We thus hypothesized that the IT sector would be interested in collective ways of accessing relational capital and knowledge, and sought to verify if this was the case and if so, what modes of governance or intermediaries could make this happen. The paper analyses these intermediaries and their contributions to the IT/multimedia/gaming sector in Montreal, the cluster policy which favors knowledge exchanges, the collective over the individual.

Keywords:

Cluster, knowledge sharing, innovation, IT, gaming, cooperation, intermediary organizations

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While the traditional neoclassical economics views the individual entrepreneur as source of competitiveness, and the market economy as source of success and economic growth (Tremblay, 2004), over recent years, it has been recognized that collective leadership and entrepreneurial activity are often at least as important. Also, knowledge and intellectual capital have replaced physical capital as the main source of competitiveness and creation of a competitive advantage over other firms (Drucker , 1993, 1988). While there has been quite a lot of research on the nature and the components of knowledge and intellectual capital, or IC (e.g., Edvinsson & Malone, 1997; Sveiby, 1997), and some research has highlighted the fact that an important level of knowledge or IC is apparently correlated with a good performance (Hsu & Sabherwal, 2011; Menor *et al*, 2007), it is often unclear how this intellectual capital or knowledge can be gained but the collective leadership and exchanges are put forward, contributing to reduce the validity or importance of the orthodox view, ie. the neoclassical individualistic view.

Indeed, some authors have put forward the idea that new collective modes of governance such as networks and industrial clusters can foster such knowledge exchanges and intellectual capital, and this would be crucial for innovation, performance as well as firm and cluster development as a whole. (Cassidy et al., 2005) Recent works have often stressed the importance of collective relational capital in the context of intellectual capital and knowledge development (Bontis, 2001; Battaglia and Tremblay,

2012; Bettiol, Di Maria, and Grandinetti, 2015)), seeing it as important if not more than individual human capital (Tremblay, 2004). Networks are seen as determinant for knowledge development (Pandey and Dutta, 2015), particularly for SMEs (Mellor, 2015). It is often the network that ensures these knowledge and information exchanges within the sector (May, 2011)

However research has not analyzed in detail type of governance of organizations or intermediaries which can be sources of such collective knowledge-sharing and it is to bridge this gap and contribute to support a more critical vision of economic and industrial development (rather than the orthodox neoclassical economics view) that we pursued research on the type of collective governance that can offer such relational capital and the motivations for firms to participate in such clusters, as sources of knowledge. As creative capital and knowledge is more and more the object of attention, we also wanted to determine to what extent IT firms can be interested in more creative sources of knowledge, and not only in the traditional individual human capital, in order to be more competitive on the basis of creative ideas, leading to more innovation. (Darchen and Tremblay, 2014, 2013, 2010). In contrast with traditional neoclassical views of entrepreneurial and innovation activity, this more collective, unorthodox view, supports the role of institutions in the economic dynamics (Tremblay, 2004, 2002) and in the development of cities, regions and nations. Indeed, this theoretical perspective puts forward the importance of networks and proximity for knowledge sharing and, in turn, to support territorial and regional dynamics (Secundo, Del Vecchio, Passiante, 2015 ;) or city development through place-making (Esmailpoorarabi; Yigitcanlar; Guaralda 2016 ; Laitinen, Osborne, Stenvall, 2016 ; Pancholi, Yigitcanlar, Guaralda, 2015 ; Carillo, Yigitcanlar and Garcia, 2014).

We thus hypothesized that the IT sector would be interested in accessing relational capital and knowledge, and sought to verify if this was the case and if so, what modes of governance or intermediaries could make this happen, to what extent this corresponds to traditional neoclassical views or on the contrary to institutionalist views, based on collective action and the role of institutions such as clusters and networks (Tremblay, 2004, 2002). Before we go into the analysis of these intermediaries and their contributions to the IT/multimedia/gaming sector in Montreal, we will present the theoretical insights, the general context of governance of clusters, the methodology, and we will conclude the paper with the results from this research.

1. Knowledge sharing and cluster governance as a competitive asset

In Canada and in Quebec, the concept of industrial cluster has proved advantageous for several economic sectors and has attracted foreign investment in various sectors, including IT and multimedia in the case of Montreal. Initiative of the PQ government and an idea initially put forward by the PL minister Gérald Tremblay, the city of Montreal has adopted a strategy of industrial clusters in the late 1990s. Inspired by Michael Porter (1993, 1988), the term cluster refers to a geographic concentration of interconnected companies, specialized suppliers, related industries and associated institutions in a particular field. These organizations not only compete but cooperate with each other (Porter, 1988). The governance of the cluster is based on what is usually called intermediate bodies, institutions that foster collective action between stakeholders.

In this article, we focus on the contributions of close relationships and cluster governance to innovation and business management on the basis of a survey of corporate

actors in the field of information technology (IT), including gaming and multimedia. We will look in particular at the role of intermediary organizations and clusters, and their impact on the innovation process of small, medium and large companies in the sector through the development of relational capital and knowledge transfers.

In a brief overview, we present the strategies of the Montreal Metropolitan Community on industrial clusters. In a second step, we will draw a portrait of the sector of IT and will identify the main intermediate bodies in the IT sector, as they have emerged from our survey of firms. Finally, after a brief presentation of the firms surveyed, we will analyze the perceptions of the actors as concerns the cluster the intermediate bodies, their roles in the development of firms and the role they play in the development of relational capital, knowledge and innovation.

2. Clusters in the Montreal Metropolitan Community (MMC)

The Montreal Metropolitan Community (CMM) describes clusters as a model designed to stimulate the creation of conditions in which new ideas and processes can pass the embryo stages to be marketed and provide a return to stakeholders (CMM 2008a). In 2002, Montreal International worked with industry to develop an action plan for positioning the metropolitan area and in 2005, the CMM included in its development plan a strategy for metropolitan clusters and a fund providing financial support. In its economic development plan for 2011-2017, Montreal strengthened the cluster strategy MWC. There were 15 clusters planned in 2004, nine are currently structured and have their own governance body (Montreal, 2011).

The CMM (2008a, b, Tremblay et al, 2012) identifies four types of clusters: the clusters that bring together internationally competitive segments (aerospace, IT, life sciences, textiles and clothing, including fashion design); emerging technology clusters, which have a high potential for long-term growth (environmental technologies, nanotechnology and advanced materials), manufacturing clusters, which have a potential for growth based on natural resources (energy, paper products and wood bio-food, petrochemical and plastics and metallurgy) and clusters of visibility or strategic sectors for socio-economic development, such as cinema, culture, tourism and services. The gaming industry is in the IT group, but also includes important artistic elements and also contributes significantly to the visibility of Montreal, so it can be considered a sort of "riding" on both segments, the competitive IT cluster, but also visibility, as it has definitely contributed to Montreal's visibility internationally.

The CMM is responsible for the planning and coordination of clusters, but does not substitute for local actors. Stakeholders should be part of a governance body, a non-profit organization under the auspices of a board of professionals. This organization must develop a business plan with goals of growth, value, performance indicators and operate in a consensual approach. Clusters should also develop a strategy for development over 10 years. The funding is then provided by the three levels of government (municipal, provincial, federal), once the private sector has made its contribution, which should be equivalent to that of other partners (25%). (Tremblay et al., 2012). These clusters are therefore institutions that foster collective action between stakeholders and consider that entrepreneurial and innovative action are developed through collective endeavours and not so much or not only through individual human capital.

3. The IT and gaming sector in Québec

In 1997, the Quebec government created the Office of the new economy and provided the multimedia sector with tax credits of 40% of employees' wages up to \$ 15,000 per employee per year for ten years. Abolished in the budget speech of 2003-2004, the measure applied to wages incurred by 31 December 2010. To take advantage of this tax break, companies had to settle in the Cité du Multimédia , a real estate project supported by the Government of Quebec in the center of Montréal. Founded in 1998, the Montréal City of Multimedia was contested, but this project has revitalized an entire neighborhood. (Munger, 2011b) "Critics see as a tax credit an artificial respirator for businesses. The figures show that it blew up real estate costs in the Multimedia City area. "(Munger, 2011a), however, it has made Montreal the birthplace of a variety of award-winning videogames, such as Assassins Creed, but also many other millions of videogames sold worldwide. The same thing was observed in the field of IT services and software, as the project initially attracted global giants such as CGI, Ericsson and IBM group. (Sabourin, 2012)

The objective was to create 10,000 jobs. The cost for the period 2005-2011 is estimated at \$ 223 million by the Ministry of Finance. Over the years, many companies have left the specific zone. CGI Group departed from this zone in December 2010, when its lease ended. IBM also left this district, as well as Motorola. The tax credit nevertheless was an important marketing success as it contributed to relational capital and helped make Montreal more competitive in the IT and gaming sectors particularly. According to

TechnoCompétences (IT sectoral committee) the annual salary in the IT sector may vary by region and type of position from 42,000 to \$ 80,000 for the most common jobs.

(Munger, 2011a; Technocompétences, 2010) This is also an important contribution to local development.

Today, Quebec has consolidated its international reputation and represents 70% of all production studios of Canada's video game industry, the third largest global hub in the industry after the United States and Japan. Several foreign companies such as Ubisoft, Electronic Arts, Eidos and Warner Brothers, have settled in the metropolis and thrive because of a favorable business environment and the quality of the workforce. Currently in the industry there is less talk of clusters, but more of clusters of excellence. (Sabourin, 2012)

The number of jobs and IT-related institutions grew by more than 4% between 2008 and 2010 in Greater Montreal, despite the global economic downturn. Montreal was ranked second among the twenty largest cities in North America on employment growth in IT for the same period. This increase is largely due to the acceleration of the IT services sub-sector (software, multimedia and IT services). Subsidiaries of foreign companies in the IT sector are responsible for over 30,000 jobs spread across some 400 institutions. Montreal hosts several industry giants and major contractors. (Montreal International and TechnoMontréal, 2013)

The strength of the IT industry in Greater Montreal is also illustrated by the performance of its R & D sector. It is estimated that over 85% of expenditure on research and industrial development in Quebec was made by companies located in the Greater

Montreal area. R & D spending in the IT sector of Greater Montreal amounts to more than \$ 800 million. Companies also benefit from lower taxes in order to conduct R & D activities. This advantage largely contributed to the establishment of companies with R & D activities in the region. In addition, there are four universities devoted to research and the dissemination of knowledge receives a significant amount of financial support compared to other major Canadian cities. (Montreal International and TechnoMontréal, 2013)

During the last decade, the IT sector in the greater Montreal area, considered the capital of the video game in North America, is one of the sectors that grew the most, more than 25% between 2002 and 2010. The industry counts nearly 120,000 workers in more than 5,000 institutions. (Montreal International and TechnoMontréal, 2013) It seems that the global economic crisis (2008) was hardly felt in the IT sector in Montreal according to the two main governance bodies of the sector, TechnoCompétences and Montréal International (2013); in fact, it was rarely mentioned among participants of large company interviewed for this project in the years from 2009 to 2014. They mentioned that the context was favorable, that public policies were generous and promising for development and innovation, the local skilled workforce and that policies and tax credits favored the growth of their industry. While in 2014, the Liberal government indicated it might abandon support to the industry, this appears difficult in a context where other cities have also developed tax credit programs to attract this industry. Of course, tax credits cannot be the only attractor and factors such as the presence of the National Film Board, educational programs and institutions, quality of life and bilingualism of the City also appear to play a role in the attraction and retention of firms in Montreal. (Rocha,

2014). Of course, smaller firms in the "start up phase" often have more difficulty, especially because they are concentrated in a smaller niche.

4. Research Methodology

We conducted a study of the IT, multimedia and videogame industry based on the consultation of the literature as well as semi-structured interviews with representatives of the sector between 2009 and 2015. Interviews with company representatives focused on their vision of the governance of the sector, the clusters and other intermediary organizations, innovation policies and their contribution to innovation in their firm and in the Montreal economy. We achieved a good sixty interviews over the years, starting in 2005, but retain here a set of 23 more recent interviews, which focus more on enterprise collaboration and competitiveness of the IT sector. The previous interviews contributed to our general knowledge of the sectorial dynamics but the more recent ones confirm the recent trends. The interviews were all transcribed, coded and analyzed in depth with thematic analysis or "witness sentences" (Savall and Zardet, 2000).

Not to reveal the identity of the companies surveyed, just note that about half were in the area of video games, or more broadly interactive services and digital media (often support companies to videogame producers), while others are in the broader IT sector. In the next section we focus on the support offered to businesses by the major associations and governance bodies in the IT sector in order to create knowledge exchanges, relational capital and *in fine*, innovation in companies.

5. What type of governance in the sector? The support of intermediary organizations

Twenty associations and groups support business growth and innovation in the sector, while research institutes focus on research and knowledge dissemination. We first present the main IT associations and their specific contributions to knowledge exchanges and dissemination.

The IT cluster of Greater Montreal is represented by TechnoMontréal, an organization whose mission is to mobilize and support industry players around common goals and concerted actions to optimize the competitiveness and growth of the industry. Founded in 2007, TechnoMontréal is a non-profit organization that brings together stakeholders from the private, public and institutional sector to support the IT cluster. This sector counts more than 120 000 jobs and 5,000 businesses. The sector consists of big players, but also a large number of SMEs. (Montreal International and TechnoMontréal, 2013) Montreal International (MI) is the result of a public-private partnership established in 1996. Its mission is to contribute to the economic development of Greater Montreal and to increase its international influence. It has a mandate to draw to the Montreal area foreign investment, international organizations and foreign skilled labor and it promotes the competitive and international environment of Greater Montreal. The organization is funded by the private sector, the governments of Canada and Quebec, the Metropolitan Community and the City of Montreal. (Montreal International et al., 2011)

Alliance numérique (Digital Alliance) 's mission is to support the growth and competitiveness of its members, to develop Quebec's reputation internationally as a center of excellence in the creation, production and distribution of interactive digital

content. The Canadian Association of Information Technology (CITA) helps promote and highlight the contribution of IT to the Canadian economy. The Association of Information Security of Metropolitan Montreal (ASIMM) educates the public and private sectors to safety issues in the IT and digital world. The Association for the development of research and innovation in Québec (ADRIQ) has as its mission to support and promote technological innovation in Quebec in order to increase the competitiveness of companies in Quebec and abroad. The Quebec Association of Independent computer scientists (AQIII) is a governance body for the self-employed in the IT sector ; it gives them the advantages of a network while preserving the individual freedom of self-employment. The Quebec Technology Association (AQT) supports its members in achieving their growth objectives and facilitates their access to relational capital and the best business practices. The Office of Film and Television in Quebec (QFTC) is the cluster for the film and television industry; it contributes to the competitiveness of Quebec as a center for film and television production and also has important exchanges with the gaming industry, which has important interconnexions with film and video production. The Canadian Advanced Technology Alliance (CATA)'s mission is to support its members in achieving their growth objectives by developing collaboration, networks and relational capital across Canada. The Centre for Applied IT Research (CRIM)'s mission is to develop and transfer technology and knowledge to its members in order to develop products and services and contribute to their local and international marketing. (Montréal International and TechnoMontréal, 2013).

The Centre for Enterprise and Innovation of Montreal (CEMI) provides specialized consulting services, management and related services for startups and business in IT and

life sciences. The CEFRIO center facilitates research and innovation in organizations, but concentrates on pushing forward the vision of a digital society through the use of technology as a lever for social and organizational innovation. The International Council of Graphic Design Associations (ICOGRADA) is also an important actor; its vision, mission and core values are personified in the motto “Leading creativity” and expressed by their members through various activities that use design as a motor for change. (Montreal International and TechnoMontréal, 2013).

The Digital innovation Consortium of Québec (FIVE) has a role in stimulating and funding the development of applied research in innovative media technologies and in facilitating collaboration between industrial partners and research institutions. The PROMPT's mission is to strengthen the IT industry through industry-university research partnerships. The Association of the electronics industry (RIE) is concentrated on the objective of bringing together stakeholders in the electronics industry to promote the interests of its members and promote the industry; its mission is to create a platform for meetings and exchanges where everyone can increase their innovation capacity and business prospects. Réseau ACTION TI brings together and mobilizes stakeholders of information technologies in Quebec; it creates opportunities to get together and helps improve knowledge and skills. It emphasizes the quality of the work and helps to promote IT in Quebec. The Photonics Network of Quebec (PQP) helps to accelerate the economic development of the photonics industry in Quebec. The Canadian Society for Medical Technology (MEDEC) is an association centered on the defense of the interests of the Medical Technology industry. TECHNOCompétences is the sectorial committee which promotes the development of the Quebec labor force and employment in ICT, so

that its expertise is recognized worldwide. Finally, the Society for Arts and Technology (SAT) is an interdisciplinary center for research and creation, production, training and broadcasts dedicated to the development and preservation of digital culture. It is impressive to see the number of actors present in the field and in fact, there are many other groups, centers, research chairs and research institutes that revolve around and work with the industry. (Montreal International and TechnoMontréal, 2013).

As can be seen, this is an area that has a large number of organizations and governance bodies that can support the sector and we have noted over the years some diversification of actors, moving towards greater diversity, including with an organization like the Society for Arts and Technology (SAT), interdisciplinary research and creation center, which seems to evolve the IT and media sector, from the technical side to the most creative and artistic side of the field, a factor noted by a number of observers of the sector in recent years, and also in some of the companies surveyed.

One thing to be noted is that we were expecting to find more “creative and artistic” organizations amongst the governance bodies of the sector, but there is almost only the Society for Arts and Technology (SAT). However, our interviews indicate that there are some more relations with other creative persons and sectors (photography, contemporary art, etc.), although these do remain more informal.

6. Results: Intermediaries and their role in sharing relational / intellectual capital

The majority of firms interviewed indicated they participate and work with many large intermediary organizations, and they consider these institutions are key in supporting the

dynamics of the sector, confirming the importance of collective stakeholders over only individuals entrepreneurs (not that these are to be neglected, but they do not appear sufficient). Research Chairs and Centres are important for the regional creative dynamics and more so for companies for whom R & D is at the center of their activities. Montreal International and TechnoMontréal are the two most frequently mentioned agencies, and this is generally the case for large-scale enterprises. SMBs also mention these organizations for their important contribution in directing firms to people with specific knowledge, and also to programs that enable them to move towards more creativity and growth. They also facilitate the process of recruitment of creative workers abroad. Investissement Québec is also very important player for the majority of businesses, as it ensures financial support. As one firm representative mentions:

“In fact, the role of these organizations is to refer us to people who can help us. Montreal International has a list of realtors, so it's a top priority to open a studio, to start hiring directors and then find a home. So it was definitely at the top of the priority list. There were economic development commissions. There are some companies that have come to me directly. There are people from Investissement Québec and Montreal International who suggested me names, but ultimately it is within a network of MBA that I found the person who helped me to find the office. So it is networking and relational capital and knowledge.” (interview no 16)

“That's true, it's quite true. Listen, we have memberships, as they are called, therefore, we have membership renewals for corporate groups as centers of commerce, IT associations, also by industry and by product lines. In other words, we have business

solutions that are designed for the health sector. It is very clear that we are very active in the health industry, and we are present in all the associations, interest groups which are sectoral and industrial areas. We will do the same in the manufacturing sector, we will do the same in the pharmaceutical sector. The list is so long that I cannot give you all, but I can tell you that we are present, it is part of our management philosophy to develop relations, to be very close to our customers and very near to what we call the ecosystem of the client.” (interview no 5)

“Montreal International brings us some facilities in terms of immigration cases for example. Investissement Québec helped us in managing the 37.5% tax credit; it is they who have the information and know if there are new projects, they can help to see if there are new programs that can make things happen. The University is a classic, they help us because this is where we find 75% of our creative people. Alliance numérique (Digital Alliance) represents the interests of multimedia in general. It helps us if there is a specific topic and they also try to have some kind of consensus vis-à-vis the priorities in Montreal. It is always interesting because if everyone is pulling in different directions, in the short term or over the long term you have no interest in doing that. You have to pull in the same direction.” (interview no 15)

In the case of Company A, a large company, all governance bodies are used in the development of the organization. Universities and other intermediary organizations help to standardize the technological processes. Research and development is at the heart of collaboration between universities and business. This is also the case for other companies encountered, who value relational capital and knowledge exchanges, as some agencies and other firms become customers for them. A global win-win approach is preferred so

that the sector is as innovative as possible, not to say however that competition has disappeared.

“I deal with universities and other organizations. For us as a whole, the list would be very long, but we do deal especially with standardization bodies, therefore, the International Institute of Telecommunications - IIT; we also have what they call organizations like CTIA for mobile standardizations in North America. Same thing for Europe, we deal with organizations for the standard 3-G systems, such as 3GPP; we deal with standardization bodies such as IETE Internet; we deal with standardization for Broadband systems. In any case, we are very involved in the technical standardization systems, and telecom. That is one thing. (...) At the Quebec and Canadian level, we are a member of ADRIQ, TechnoMontréal, CATA, the Board of Trade of Metropolitan Montreal, as well as Prompt -Québec. Then we do research projects with UQAM, we have research projects with the Ecole Polytechnique, we have Research Chair with them. We have projects with McGill, Concordia, the ETS (École de technologie supérieure) is a new partner, we are doing research in software, we have projects with the University of Toronto. We sometimes work with the Center for Communication Research in Ottawa, we support NSERC strategic projects involving the University of British Columbia, other projects with Laval University, the INRS. (...) With the INRS, we did research on the 4G radio technology called MIMO. With McGill, we work on a Broadband technology. With UQAM, there is a Next Generation Green Internet Project. With the University of Toronto, there is a new project in which we are involved. So we have collaborations with all these actors. (interview no 1)

“I do not know if it's part of governance... yes, I think it's part of intermediary bodies; we

work with Universities... for example, we invested in an industrial chair at the University of Laval, this is not Montreal, it is Quebec. In Montreal, we work with the CRIM and they are a potential customer for us. Also, Montreal International with whom I worked on immigration issues; Investment Quebec in Montreal too; Industry Canada also (...) In fact, we have relations and work with just about everyone. Intermediary bodies, necessarily, therefore, universities, we work with them to the fullest.” (interview no 13)

Our interviews indicate that Investissement Québec and Montreal International are major actors; they provide strategic support, information on financial and tax programs, they help in international mobility issues, provide sectoral expertise, comparative economic data on the business environment and also provide support to enjoy privileged relationships with federal partners, provincial and municipal governments, with business and financial networks, as well as academic training and research centers. It is clear that all these organizations contribute to develop relational capital and knowledge to foster innovation in firms.

“Investissement Québec, I love Investissement Quebec because they have a philosophy of bringing companies here in Montreal and I have good friends there. It’s been years that I have known them. What they often do is that they bring companies who want to invest in Quebec, to work here; I am often the first person they will meet. So I’ll tell them about the market. I’ll say “here Montreal etc., etc....” I tell them how the market is, they might be a future customer, that is how I work with Investissement Québec. Montreal International is the same.” (interview no 10)

We see in this last quote the role of proximity with institutional stakeholders to develop business and promote knowledge exchanges and creativity in the field.

“It is very unusual compared to other companies, that is to say we have a double discourse, the discourse of being a French company whose management has migrated from France to here, so we consider we are from Quebec, but also Canadian and French. So governance bodies like Montreal International, Investissement Québec are important for a strong video game development; this is an example of a company that is doing well, the development is doing well. Also, the boss and the president and six directors migrated from France to here because the quality of life is better. You see, we play ... I play ...” (C)

“Working with Investissement Québec gives you automatic credibility. That is clear; I am one of the few organizations in Canada that works directly with Investissement Québec. I have a link directly with the director in Europe. He said: I have a company coming up here, this is the name, I will book dinner with them. I want you to talk about the industry.... it's the same thing with Montreal International. There is a company that is here now, in our office, they may invest in Montreal eventually. Can you help us explain...it's a little idea of my philosophy, my business is credibility. I'm not from the paper industry, I was born and I have only worked in the video game industry. It's an issue of credibility that helps a lot and yes, a lot that's for sure. (interview no 10)

According to participants' perceptions, intermediate governance bodies and educational institutions also help to promote the industry, as in the following two cases with Alliance numérique (Digital Alliance), whose mission is to be a center of excellence in design, production and distribution of digital interactive content but also to offer very specialized training to the industry. Alliance numérique is seen as an essential intermediary organization with industry. The great leaders of the audiovisual and television industry as Telefilm Canada and Télé-Québec also seem to play an important role not only in

promoting exchanges between creative and IT sectors, which is fundamental to the artistic and creative renewal of the industry, but also by supporting projects financially, dealing with intellectual property and even training as a business partner.

“Alliance numérique can help promote the sector as can those other organizations, intermediaries. Yes, in that sense. Except that, again, it is not presented under the auspices of X. So it helps the industry, but it does not directly help the company itself. Indirectly, it is sure that yes. (...) ... At Alliance numérique, or with Tele-Quebec, there are opportunities for collaboration.” (interview no 7)

“Yes. There are many intermediaries and governance bodies. Alliance numérique, Telefilm Canada, Télé-Québec...It's sure TFC comes in first in intellectual property development level. (...) The Bell Fund, actually helps a lot financially. Telefilm is beyond finance, it is in the showroom where we went, we did training with them on the financing of a project, as the board is a financial business partner. Governments help a little ...

“(interview no 17)

One company, which specializes in the design of multi-platform marketing strategies, also received help from intermediary organizations and finds it is a useful and ongoing process to ensure the growth of the company, whether in terms of financial assistance, training, creativity, knowledge, ideas and resources.

“This is permanent. We are no longer at the stage of start-ups. We are an SME. We always need support, it is permanent because when you're growing all the time you need access to training, financial assistance, creative ideas, knowledge, resources, etc. As a SME, finally, you do not have much resources. You do not have a lot of people, you do

not have much money, you are all the time oriented on sales. You do not have time to delegate, be able to discuss, to see people who have done this work and give you the knowledge, intelligence, it is fundamental for an SME to have access to agencies that help with access to knowledge, relations, etc. SMEs would struggle to live without this.”

(interview no 22)

It should be noted that some companies seem to consider they do "not to have a lot of help" or little financial help, even with the presence of Canada Economic Development (DEC Canada), Investissement Quebec and Montreal International. This is the case for one company which operates in customized training online, another company which is specialized in designing multiplatform marketing strategies and creation of creative content and another firm in multimedia animation. In the case of G, the Local Development Centre (CLD), granted them a loan there for years, but they consider this was very limited (and CLDs were abolished in 2015). The positive perception toward support for creativity and collaboration is therefore not unanimous.

“We did not get much help. It was Canada Economic Development has helped us. That's it. We had a CLD loan there for years.” (interview no 7)

“In terms of time, that's it, we try to make the beta product for May 1 and run to June. But at the same time, I am afraid that financially, we cannot do it. I will be forced to slow down to preserve my assets. I do not feel like running into a brick wall. If the financing comes in, there is no problem, but if the funding does not come, that's risky, you burn your gas, and you're in the face of a wall. You come, but you have nothing. It is a little hard, that.” (interview no 14)

“I know, I have already called for Quebec ... Montreal International, I had some

discussions with them, but ultimately we did not go forward. But if X ... X may be ... It may be on an individual basis that people stay connected to those organizations there to stay updated throughout the development. That is what we did ... I try to go back in history... ”. (interview no 22)

Strangely, some small businesses struggling to get financing, such as N, see in the intermediate bodies an obstacle rather than an aid to the development of more creative enterprises. N is a company that works on a particular product with digital 3D avatars and complex modeling. Before marketing its flagship project, the company has three years to seek funding to expand its product and it considers that it is not always easy for the most original and most creative companies to get financial support as is the case for major IT companies.

“I am a bit skeptical about these organizations.... We need money, and at that point, we lose time to seek advice, going in the wrong direction anyway. I’ve done it, and I have not had a good experience with this. And what saved me, it’s money, it is not advice. Because there may be multiplications of intermediaries and I think it is better that the government help people who want to go ahead, who want to grow, to have the facilities, keep their money because, well, we learn we learn the hard way, but you learn. That’s what is important. (interview no 14)

As can be seen, some consider advice is not as crucial as money, or at least it cannot replace funding. The two may be essential, views diverge on what is most important. The link between large IT companies and creative or artistic sectors, is in their opinion not so obvious nor so certain, and that is the opinion of some intermediary organizations who, even if they would like to see more collaboration between IT and creative sectors do

not always see this develop so strongly, nor spontaneously.

The CEFRIO is a paragovernmental agency which facilitates research and innovation, as well as training and knowledge-sharing, in organizations in order to bring about the digital society. It is seen as an organization with an interesting mission for one company working in the development of customized training online. For this company, it offers the advantage of targeted collaboration with a person within the organization responsible for their training, technical and technological needs. However, again, collaborations between IT and creative sectors do not seem so spontaneous, although one might expect they would be more present in online training.

“CEFRIO is an organization that has an interesting mission, highly skilled resources. Now, especially when it comes to e-learning, CEFRIO personnel has seen a lot. When it comes to online training, she knows what she is talking about. It is very good because previously there was no one who knew what online training was really about. Now, CEFRIO is competent in other areas, that I do not know. But now, there is a competent person to represent our industry. And that's fine. So much the better.” (interview no 7)

The CRIM is a non-profit organization established in Quebec since 1985. CRIM is an applied research center that develops IT applications in different sectors to accelerate the learning process and transfer of knowledge to enterprises. It is responsible for bridging the gap between the worlds of academic research and the business world and seems to be supportive of a good number of small firms in particular, but not all appear to see the need for continuous support; it is rather ad hoc consulting in some cases.

“In some cases, I like it, they are responsible for certifying software developed by some companies.(...) We are very active, we do not talk much with the world, we talk a bit with

the CRIM with whom we do business. On the one hand, anyway, we must certify our software, as software in health, they are certified by CRIM. But other than that, I would say, we have very few relationships with the organizations. (interview no 9)

“It is one of the great support organizations, the CRIM. On the one hand, we - my god, I think it's been 20 years, if not more...- we have provided a lot of computers at the time we were there. We have a room called the "Room E". We certify the programs still for more than 20 years for some specialists who are, for example, graduates of the ETS, or Polytechnique, who work in extremely sharp areas, especially in programming or in other areas where it requires technical certifications. We have been working with the CRIM on an annual basis for several years.” (interview no 5)

CRIM also offers continuing education and keeps members informed of activities and events that local and foreign bodies organize, but does not appear to open the door to more creative industries, instead remaining focused on technique and technology, which constitute its mandate. It is nevertheless an institution which is based on the collective dimension, rather than the more orthodox view of the individual entrepreneur as source of entrepreneurial and innovative success.

“I subscribe to almost everything related to technology that I get in my mailbox. CRIM, I get at least their training schedule for the year. Yes, absolutely, I am a member of the Order of Engineers of Quebec by my education and the Order is starting to do continuing education. They send a calendar of events. And all US agencies also because today, all is decentralized and training can come from anywhere as I am in the field of Lotus notes... I'm in touch with news groups etc. that keep you informed of their activities. I often participate in online seminars that are very interesting. It is often given at a specific time

in the morning ... so for us it is easy to keep the links in the area.” (interview no 4)

As for Technocompétences, the IT sectorial committee, perceptions are mixed.

According to some stakeholders, Technocompétences is a key player, in training and knowledge sharing, while another company is less enthusiastic. Many firms consider that a company in the videogame industry must be a privileged living environment, and have a strong creative culture. Some of our interviewees perceive that Technocompétences has a good understanding of the needs of the industry, while others consider it has a better understanding of the pure IT environments, than of the more creative ones such as the videogame industry.

“TechnoCompétences obviously knows what is e-learning and also Alliance numérique. So these key players have sufficient resources to know what it is and support us.” (G)

“Technocompétence. That's a bit of a mystery. There was an open discussion on the shortage of labor, if it was a reality or not, and what skills were needed and someone said that the artistic, creative view, that was the big problem, that there would be a shortage of artists while the technological side should not be a problem. I fell off my chair because I realized that in the categorizations, people from IT, information technology, were put together with the video game programmers; there was a surplus of IT people and it was to cancel the great shortage of programmers, while these are two completely different skills.” (interview no 16)

In the creative field of video game integration, some firms consider that there is a very interesting organization, a sort of incubator, which allows you to quickly train young dropouts for work in testing in the industry and this offers a good pool of testers for the market. The social mission of this organization creates a synergy with the companies for

a better integration of young people in the organizations. It seems that both parties, employers and future employees, are grateful for this initiative. This is the case of D, a small IT services company specialized in e-learning, which sometimes acts as a subcontractor for larger companies. One company, which specializes in avatars used this organization and its program to test its new product and improve it for the end user in the market.

“We helped create a training program with an organization called Youth Integration. This organization takes dropouts and tries to put them back on tracks; it offers a six-month training, they are taught how to behave in a company, write correctly, to become testers, and then after the training they work with our trainers for testing. And people at the end of six months, they are happy because they are back to a normal life, being either with us or wanting to work at another company. And these are people have eternal gratitude for what we have done for them.” (interview no 4)

“So I experienced the software with a youth group, they enjoyed it. And then, they will continue an experiment with the Windows software. But you need to train these people, it is the Web application. Indeed, it would be great for children because they could create characters. And it is sure that there is a market. They do not even need to download software because here we are doing a web version, simply connect to the Internet and create the character.” (interview no 14)

Beyond the role of counselor or trainer that emerges from all the interviews, especially among small businesses, intermediary organizations seem necessary to their financial survival and expansion, apparently less in terms of creativity or exchanges with more artistic circles. Research grants and especially the tax credit appear essential for the

majority. It's a way to stay on track, to pay employee's salaries, keep going as a business or to assist in the expansion of the company among those whose product has not yet reached maturity. Even among companies of medium and large size, the tax credits are seen as a *sine qua non* of job creation. They have gotten used to the tax credits, and company growth was fuelled by tax credits.

“That’s obvious, you can say that it helps support the company, it's obvious. In the military sector, yes, it has opened many doors, Industry Canada, all the relationships we have. And also at the international level, indeed, with offices in Quebec.” (interview no 2)

“It is very good because everything is credit on wages of employees which returns to us, that's fundamental. In any case, I think it's what helped me with the R & D, because I was almost totally R & D. But the day when I will not be totally R & D, when I start to have other developments, if I can get credit, it will help me too. Because at that time, you can have more competent people, so we pay them wages that correspond to wages they deserve, absolutely.” (interview no 14)

“There are programs that have helped to expand, because we had tax credits for the type of jobs created. This is the technical support to customers, even then there are people here that serve Western Canada. So those positions were created here because there were advantages to do so, and we have access to a bilingual workforce. They are on shifts that are aligned with the time difference to cover Vancouver and Calgary as well. It is clear that this has helped to create jobs here in Quebec in this call center, which is great technique.” (interview no 20)

“In our company, as a service provider, also specialized in online training, tax credits for research and development are obtained through a specialized company in this field of tax credit claims for research scientific and experimental development (SR & ED).

Currently it is with a specialized company that we get a tax credit for research and development and all that. It may not look very big, but it's still big, but not as much as PriceWaterHouse. But in fact it is a specialty in itself to know how to get tax credits and grants. (interview no 7)

Local development centers in Quebec are also a resource used by many companies of smaller scale. Beyond financial support, local development centers offer toolkits for entrepreneurs, such as guides to writing a business plan. They offer an evaluation and improvement of the business plan and entrepreneurial profile, while providing information on the legal aspects and other services for a new entrepreneur. This is the case of small business D, specialized in computer services and e-learning, which has had an interesting experience working with a CLD in its neighborhood to build its business plan.

“It's interesting because I could start my own company but really alone. What I found interesting in doing business with the CLD is that they helped me to accept a subsidy that was really minimal, which was ten thousand dollars a year. We had to do a business plan for the fiscal year, and that helped me, because I could have continued to do what I did as a company but the CLD brought me to make the effort of thinking further on, to project myself further, and that's something that interested me in the CLD's support”. (interview no 4)

The social functions organized by intermediary organizations are also an opportunity to maximize networking between partners and professionals, and sometimes with more creative circles such as the SAT (Société des Arts technologiques, or Digital arts society). It is also an opportunity to recruit some of the creative workers, even among competitors. It is a way to get to know and develop new products and get as much funding in the small and medium size companies as in the large businesses.

“ For the company, these are the events that have been most useful in seeking funding for our product. It is the meeting of foreign investors which allowed us to deliver a marketable product in the end. Social and professional events, it is sure that all my engineering team was trying to network the maximum to get other quality engineers on board. Relationships with private partners, yes, it’s important ... it's not so much their own resources, but actually, they help us in finding resources elsewhere, that's obvious. And always in the IT. And, yes, internationally, we will seek resources, yes. (interview no 2)

“It was a virtual world conference in New York. It is much smaller than Siggraph because it is much more in development, in virtual worlds. But there is a huge wave that is developing. So, my two Americans had prepared for me a series of meetings and there, I felt that my product responded to a need for the creation of virtual characters. The developers of virtual worlds, it's difficult to come in that field. So we had a lot of interesting feedback and it allowed us to obtain financing.” (interview no 14)

“ Informal events are also a way to make ourselves known, innovate and discuss business, formally and informally. These are in some cases monthly events or simple informal discussions in a bar where entrepreneurs discuss in a friendly way. And there's

an event called the Yulbiz, once a month, which includes business bloggers, so bloggers who talk business there. So I started attending that event, which is a completely informal event, on the last Tuesday of each month, we meet in a bar, we exchange, we discuss all sorts of things. Initially, there were 30 people and then at one point, it became very popular, and there, there's been other events, there have been so-called camps so we organized to go to a camp.” (interview no 19)

These events also take the form of conferences, sponsorships or career days at universities to recruit IT staff, but also creatives. This is the case of two companies, one in multimedia, the other in IT, two leaders in the field.

“It is really the meetings. This is what we are seeking, it is actually in universities, we participated in mini-stands for talent, inside universities. So it's events, conferences, sponsorships too, that's where we find engineers and creatives. (interview no 2)

“Absolutely. Sure we go to universities, for example, there were some Career Days at universities and this allows us to have a more direct contact, but our website is incredibly active too. (interview no 5)

Various quotes from interviewees show that some want to integrate more creative and artistic dimensions with the business side, but this is not the case for all. If for some this involves meetings between funders, IT people and creatives in various social gatherings, for others, the social functions are useful but of lesser importance. Their field of activity is perhaps less known or less "artistic" or creative, than areas with more visibility such as video games. This is the case for one company that develops online training, and where recruitment of staff does not happen through social events. It offers prospects that may be

less creative and popular than big design and multimedia studios, so it does not feel social events are important for its specific line of business.

“We can speak of social events, but actually, our line of business is not well known. it is simply non-existent, therefore, not considered, whereas all the talk is about design positions in the video game market especially, if we talk about the media...In general, the CVs will be sent to these firms before being sent to us. So it is the reputation of the business that determines if there are good CVs coming in, if we will be able to recruit more easily. Then, if we have private partners and they operate in IT, then I can poach their resources, it's more the partners. We tend to talk directly IT to IT.” (interview no 7)

For the majority of companies however, the opportunities to meet with other stakeholders including trade competitors are "very rich" and they say they would benefit if they were more fully developed, as this would give them more access to specialized resources, knowledge, relational and intellectual capital. Another interviewee strongly encourages young entrepreneurs he encounters to increase their visibility "intellectually and physically," as in the events on web platforms and popular social networks. He says it promotes the creative synergy to see more of Quebec in terms of creative projects and innovative business people on the web, while making it possible to invest in lucrative projects for all entrepreneurs in the IT sector. The exchange of ideas, relational capital and networking opportunities with other brilliant people who are working in the same areas as you, not necessarily competitors, but even competitors according to some, these are important.

“The exchange with these people, it is very, very rich. And that, in Montreal, it's not as bad now, but that trend for everyone to work in their basement, and not go out and meet

people, this is not good. What I say to young entrepreneurs - people come to see me often, because we raised a round of financing, and they come to me to ask what to do and all that - I say that you must be present, not only intellectually, by blogging about your application expertise, using Twitter, using Facebook, but you must also be physically present in some events, because otherwise the community will think you do not exist. So it is really a system ... Innovation, I'm interested in this a lot, because I find that in Quebec, we tend to think in small dimensions, but no, we need to think big, be big, big, big, ... to think as if we were sitting in San Francisco. We can return home in the evening on the Plateau Mont-Royal, but we must say: "My next project is not YouTube for Quebec, my next project is a project that will revolutionize the world. " ... I think what we have shown in Quebec what we are able to do things very artistically. So we have showed the rest of the world that we are very good artistically: Celine Dion, Cirque du Soleil, Robert Lepage. I am extremely proud of these people. Daniel Langlois. I am very proud of these guys, now I want us to move to the next step, into business, to combine art and business, because I think we are recognized a lot in art and culture, but I would also want us to be seen as great business people, we are innovators in the Web, in the things that make money, in things that are built to make money. (interview no 19)

Conclusion

In sum, research funding is at the heart of concerns, and intermediary organizations whose mission is to provide financial support are essential. However, most companies consider that training, access to knowledge, to collective relational and intellectual capital and to human resources and creative talents is also a major part of the challenge, and

often as crucial to success, if not more than the financing dimension, which cannot be neglected however. Networks and intermediary organizations appear to contribute to this. On the creative side, while some companies are open to collaborations with very different artistic circles, creative, this is not the case for all. Also, beyond the speech on the importance of working with the creative community, to bring the "artistic" and creative dimension in IT, the vast majority of companies are more focused on their own specific IT business. In this case, while they recognize the importance of institutions which are based on the collective dimension, some of them nevertheless seem to cling to the more orthodox view of the individual entrepreneur as source of entrepreneurial and innovative success. There is a tension between the two visions, the orthodox and more critical or unorthodox vision of collective action, and many entrepreneurs and businesses seem to hesitate still between the two visions. They do not always profit as much as they could from the collective resources offered by the various intermediate organizations.

Also, although it would probably be very interesting and fruitful to combine artistic, creative and IT people, both sides remain rather shy, and this is especially the case on the side of IT. The gaming industry and multimedia are clearly more open, especially because they have artists and creatives within their organizations, but in more traditional IT companies, it seems more difficult to open up to the art or creative worlds and to integrate more creative people, activities and companies, in order to foster more innovation and competitiveness.

For all respondents, the tax credits offered by the Québec government are considered to be necessary for the survival of businesses, but also for the growth of the sector. In terms of governance and support organizations, local development centers (CLD, abolished in

2015) were also seen as very useful for smaller companies or start-ups, while most events organized by intermediary organizations present an opportunity to socialize and exchange knowledge. This is sometimes profitable in financial terms, on the short or longer term, and it is always useful in terms of visibility, of technical knowledge and recruitment of qualified personnel.

To conclude, the analysis of our interviews shows that intermediary organizations and specialized collective governance bodies are very important for business innovation in the industry. Interfirm collaborations also appear very useful for innovation and business development. For some, the quality and skills of the local workforce is a source of creativity and innovation, while for others the workforce does not reach the ideal of corporate demand, but is also seen as determinant. Social events are also a way to maximize networking between businesses and creative talent, although some firms complain this can lead to labor poaching. While the critical unorthodox vision based on knowledge sharing and collective leadership is present in many minds, there is still some tension with the traditional orthodox vision of the individual Schumpeterian entrepreneur who can succeed pretty much alone (Tremblay, 2014,2002).

On a theoretical note, our interviews confirm that knowledge and intellectual capital have replaced physical capital as the main source of competitiveness and creation of a competitive advantage over other firms (Drucker , 1993, 1988); this is true in the IT but even more in the gaming and multimedia sectors. While there has been quite a lot of research on the nature and the components of knowledge and intellectual capital, or IC (e.g., Edvinsson & Malone, 1997; Sveiby, 1997), and some research has shown that an important level of knowledge or IC is apparently correlated with a good performance and

innovation (Hsu & Sabherwal, 2011; Menor *et al*, 2007), it remains unclear how this intellectual capital or knowledge can be gained and to what extent collective institutions can contribute to this in all sectors of activity.

Our research confirms that networks and industrial clusters can foster such knowledge sharing and intellectual capital, and this appears to be crucial for innovation, performance as well as firm and cluster development. Some recent works have stressed the importance of relational capital in the context of intellectual capital and knowledge flows and business development (Bontis, 2001; Tremblay and Yagoubi, 2014); this research confirms this role for IT and gaming.

Also as research had not really looked into the type of organizations or intermediaries that can foster the development of relational capital and knowledge transfers, we sought to bridge this gap in the existing literature. Our research let us to identify types of intermediaries that can offer such relational capital, and the motivations for firms to participate in social relational activities organized by these governance bodies or clusters, which give them access to sources of knowledge.

As creative capital is more and more the object of attention in critical/unorthodox views on innovation, we also wanted to determine to what extent IT firms could be interested in more creative sources of knowledge in order to be more competitive on the basis of creative ideas, leading to more innovation, as had been observed in other sectors, such as fashion (Tremblay and Yagoubi, 2014). It seems the interest is limited to some firms that are more active in the gaming industry, while the more traditional large IT firms are less open to the creative talents, or don't really see the interest for their business.

It is clear that the IT sector is keen to access sources of relational capital and knowledge, and we confirmed that intermediary organizations can be useful in developing relations between firms to foster future sources of knowledge and intellectual/relational capital. This confirms the interest of these new visions of innovation, based on collective intelligence, knowledge sharing, rather than only on traditional factors of production (cost of resources, etc.).

There are obviously limits to this research, which is concentrated in one sector, one city and a limited number of interviews. However as much work on the IT and multimedia sector in Montreal has concentrated essentially on one of the largest firms, Ubisoft not to name it, it is interesting to have access to the views of other participants in the industry, some of which confirm the views of this particular firm, but some which are different. Future research would be needed to confirm the views of the industry over time and to determine if the intermediary organizations and governance bodies in place still do the right work in order to foster relational capital and knowledge transfers in the IT and multimedia sectors in general, and to what extent they can benefit from more creative sources of knowledge.

However, we show that some IT firms can be interested in more creative sources of knowledge, and not only in the traditional individual human capital, in order to be more competitive on the basis of creative ideas, leading to more innovation. (Darchen and Tremblay, 2014, 2013, 2010; Tremblay and Yaboubi, 2014). In contrast with traditional neoclassical views of entrepreneurial and innovation activity, this more collective, unorthodox view, supports the role of institutions in the economic dynamics (Tremblay, 2014, 2007, 2002), but more work needs to be done to confirm this more convincingly.

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