

Presentation of Article 1 from the Research Group:  
*Creating Digital Opportunity*

« **Cross-fertilization of Innovation in the  
Quebec Multimedia-IT Ecosystem** »

**Keywords:**

Innovation, cross-fertilization, collaboration, multimedia, IT, ecosystem,  
knowledge exchange, value creation, reappropriation, inter-industry.

By: Louis Rhéaume, PhD  
Researcher and Teaching Assistant, TÉLUQ  
Associate Professor, ISTEAH  
Lecturer, ÉTS  
Adjunct Faculty, Champlain College  
and  
Diane-Gabrielle Tremblay, PhD  
Professor, TÉLUQ

May 3, 2017

# SUMMARY

1.  
Introduction

2.  
Key  
Definition

3.  
Key  
Highlights  
of the  
Quebec  
Multimedia-  
IT sector

4.  
Methodology

5.  
Results and  
Discussion

6.  
Limits and  
Conclusion

7.  
Questions

# 1. INTRODUCTION (2)

## ABSTRACT

- Analyzes cross-fertilization for innovation in the Quebec multimedia-IT ecosystem.
- Based on interviews with managers
  - from 30 organizations
    - ✓ (15 firms and 15 non-businesses)
    - ✓ in 7 different sub-sectors of the ecosystem,
    - ✓ with 11 different types of organizations.
- Identify converging themes, patterns and trends for value creation.
  - We identify the methods used by members of the ecosystem for cross-fertilization for innovation.
    - ✓ We study who works with whom in the ecosystem,
    - ✓ and why they are working together.

# 1. INTRODUCTION (2)

## ABSTRACT (Continue)

- We also explain the limits in cross-fertilization for innovation.
- We focus in this article on:
  - inter-industry collaboration,
  - innovation strategies and
  - knowledge exchanges between firms and organizations.
- We provide practical applications of cross-fertilization for innovation in the ecosystem.

# 2. Definition:

## Cross-fertilization for innovation (2)

- **(Moor 2013)** Transfer or exchange of ideas from one sector to another and according to recent theories, this is one of the most important sources of innovation, as the diversity of knowledge and ideas leads to new and better innovations.
- What is important = make the inventory of competencies and expertise in order to appreciate the sectors where innovation is used for a particular application that may be extrapolated and experimented in other domains.
- The results of this cross-fertilization between 2 sectors or 2 firms can lead to innovation and thus, can possibly bring value-added to the firm by enabling a series of profitable discoveries.
  - It may be possible to exploit sub-products from related innovations, in a gradual process of innovation.

## 2. Definition:

# Cross-fertilization for innovation

- In networks or clusters of firms, cooperation is encouraged between laboratories, research centers, universities, scientific institutions or other organizations.
- In such a context, knowledge exchanges and cross-fertilization make it possible to explore new domains, to master the risks of developing new products, in order to penetrate new markets.
  - One way to do it is through the *co-development* of promising applications with partners,
  - but it can also be simply from *gathering ideas following knowledge or information exchanges.*

## 2. Some organizations doing cross-fertilization for innovation in Quebec multimedia-IT sector

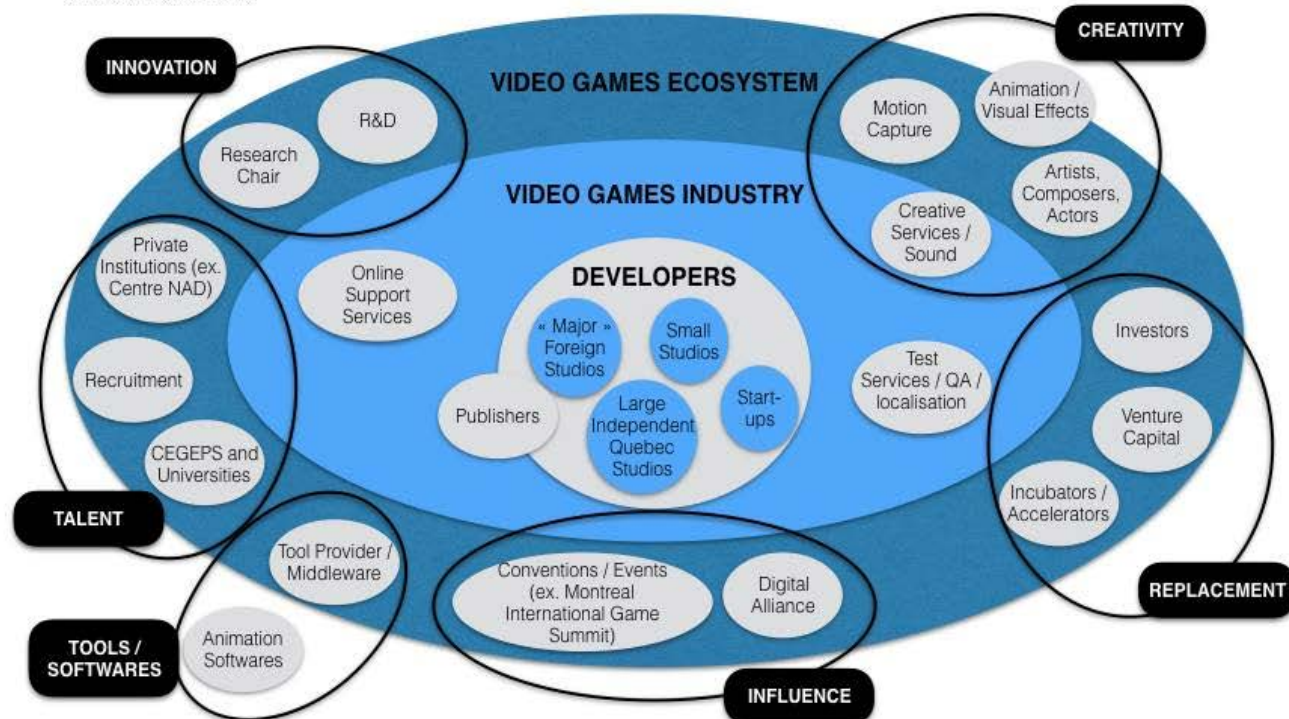


# 3. Key Highlights of the Quebec Multimedia-IT sector (2)

## A Real Ecosystem, Built Around The Creative Core : The Developers

Only a few territories throughout the world may boast of having an industry that combines critical mass as well as depth and scale. Among these, Quebec has...

- A collaboration between enterprises eased by proximity.
- Hundreds of developers from every size developing for each platform, some of which are also publishers.
- Significant exporters : especially test and quality analysis enterprises.
- Educational and training institutions, organisations funding research, innovation, influence...
- Links with related creative industries where Quebec also stands out : animation and visual effects, multimedia environnements...









# 3. Key Highlights of the Quebec Multimedia-IT sector (2)

## Booming partnerships between industry and research fields

### Each year, video game enterprises invest in research and create important partnerships with training institutes

- Enterprises also offer internship programs to students and many of them organize each year recruitment activities on university and collegial campus.

<b>NAD CENTER</b>		<p>Founded in 1992, the <b>Nad Center</b>, a self-financed institution of the Cégep de Jonquière, is an important training center in animation and design.</p> <p>Since 2008, the University du Québec à Chicoutimi (UQAC) and the Cégep de Jonquière signed a partnership to develop credited university programs including a baccalaureate in 3D animation and digital design.</p>
<b>FUN II RESEARCH PROJECT UBISOFT AND LAVAL UNIVERSITY</b>		<p>In May 2014, Ubisoft Québec announced an investment of \$400,000 in a new research project aiming to identify the « fun » factor in collaboration with the CRSNG and Laval University.</p> <ul style="list-style-type: none"><li>• This project aims to develop games that will adapt to players' emotions.</li></ul>
<b>RESEARCH CHAIR IN ARTIFICIAL INTELLIGENCE UBISOFT AND MONTREAL UNIVERSITY</b>		<p>In 2011, Ubisoft created the <b>Industrial Research Chair on Learning Representations for Immersive Video Games</b> in partnership with the Natural Sciences and Engineering Research Council (NSERC).</p> <ul style="list-style-type: none"><li>• Ubisoft financially contributed to the amount of one million dollars on five years to Montreal University as well as making available several of their technological and human resources (employees, softwares, laboratories).</li><li>• The Chair's discoveries are made public, which enables the whole industry to benefit from it.</li></ul>
<b>TAG LAB AND RESEARCH CHAIR OF CONCORDIA UNIVERSITY</b>		<p>The <b>TAG (Technoculture, Art and Games Research Center)</b> is a multidisciplinary research center on creation and video games design, interactive art and digital culture based at Concordia University.</p> <ul style="list-style-type: none"><li>• The TAG lab and Concordia University organized the <b>Global Game Jam 2013</b> : the biggest simultaneous game developing festival in the world where the participants have 48h to invent a game according to a given theme.</li></ul> <p>Concordia University's Arts &amp; Sciences department also have a <b>Research Chair in Digital Gaming and Design</b>.</p>

# 4. METHODOLOGY (3)

- 7 themes:
  - innovation management,
  - inter-industry collaboration,
  - training of IT workers,
  - human resource management,
  - firm and
  - economic development
  - suggestions for policy improvements for governments.

## ▪ Qualitative Research

- Interview analysis
  - 30 interviews: key actors from MM-IT ecosystem
    1. Trend and Pattern Analysis
    2. Divergence and convergence analysis

- Firms from telecoms, computing, IT, multimedia, media, video games and special effects.
- The interviews lasted between 30 minutes and 1h25.
- All the interviews have been recorded and transcribed.

# 4. METHODOLOGY (3)

## Presentation of the 30 interviews

Types of non-business organizations	#	Types of firms	#
	15		15
Incubator	1	Startup	4
Accelerator	2	Small	2
Local Development	2	Medium	5
Professional Association	2	Large	3
Support / Consulting	2	Para-governmental	1
Training	1		
Research	1		
Cluster	1		
VC / incubator	1		
Consultant	1		
Government	1		

# 4. METHODOLOGY (3)

**The Miles and Snow strategy typology used for our analysis.**

Strategy Type	Definition	Examples
Prospector	Is innovative and growth oriented, searches for new markets and new growth opportunities, encourages risk taking	3M / Facebook
Defender	Protects current markets, maintains stable growth, serves current customers	BIC / Warner Bros Game
Analyzer	Maintains current markets and current customer satisfaction with moderate emphasis on innovation	IBM / CGI
Reactor	No clear strategy, reacts to changes in the environment, drifts with events	International Harvester in the 1960s / Some governments

# 5. Synthesis of the Results (9)

Different strategies used for our analysis.

Miles & Snow typology	Innovation strategies	Cross-fertilization strategies
<ul style="list-style-type: none"> <li>• <b>Prospector</b></li> <li>• <b>Analyzer</b></li> <li>• <b>Defender</b></li> <li>• <b>Reactor</b></li> </ul>	<ul style="list-style-type: none"> <li>• New products</li> <li>• New services</li> <li>• New business models</li> <li>• New processes</li> <li>• Knowledge exchanges</li> <li>• Economic development</li> <li>• Commercialization support</li> </ul>	<ul style="list-style-type: none"> <li>• Co-development through partnerships (academia, association, firm, customers, suppliers, startups)</li> <li>• Coopetition</li> <li>• Buying innovation,</li> <li>• Other forms of open innovation</li> <li>• Assist conferences</li> <li>• Networking</li> <li>• Research centers</li> <li>• Social projects</li> <li>• Joint-venture</li> <li>• Knowledge management</li> <li>• Networking with peers</li> <li>• Networking with experts</li> <li>• Hackathon</li> <li>• Technology meet-ups</li> </ul>

## 5. Synthesis of the Results (9)

### Who works with whom? Non-business organizations and firms.

Types of firms	Incubator	Accelerator	Support / Consulting	Training	Research Center	Independent Consultant	Venture capitalist	Professional Association	Local Development	Cluster	Government
Startup	X	X	X	X			X	X	X	X	X
Small		X	X	X			X	X	X	X	X
Medium			X	X	X	X	X	X	X	X	X
Large				X	X	X		X	X	X	X

# 5. Synthesis of the Results (9)

## Some examples of cross-fertilization initiatives

### Multimedia Digital Agency

- Startup at the heart convergence between multimedia, IT and art sector.
- Offer augmented reality solutions, 360 video and virtual reality.
- 20% of revenues invested in R&D. Benefit from R&D tax credits.
- Many foreign customers and from diverse industries.
- CEO: “Montreal gives us many advantages such as world-class students as good as in Silicon Valley, cheap and affordable labor with high quality, low cost of living, access to many engineers as well as artists... What could be improved is the commercialization support for startups and SMEs.”
- The firm really benefits from its location: the Mile-End neighborhood of Montréal.

# 5. Synthesis of the Results (9)

## Some examples of cross-fertilization initiatives

### CRIM

- Computing Research Center
- In 5 years: 465 R&D projects
- 60 networking events
- 120 students
- +150 publications

### CRIM General Manager (Mr. Labonté)

*“If we compare Quebec with Europe or even the Silicon Valley, we have the mentality that ‘The entrepreneurs will do everything by themselves. Externalize projects and getting all the expertise from external sources happens very often among SMEs or startups.*”

*On the other hand, if we take the example of Silicon Valley (with a little exaggeration), an entrepreneur would say: “I have a vision, here is what I want to do, I want to become big like that, do what is needed for this, bring 3 or 4 partners and share the pie of the market... and the size of the pie would be much bigger...”*

CRIM offers an extensive team of world-class experts who will be happy to develop or adapt structuring technologies for your business.



Vision and Imaging



Speech Recognition



Development and Internet Technologies



Advanced Software Modeling and Development



# 5. Synthesis of the Results (9)

## Some examples of cross-fertilization initiatives

### CRIM General Manager (Mr. Labonté)

*“Here in Quebec it is more: “I have an idea, I will do everything by myself, we will try many things internally and we will have a small pie as a market... Often small firms will lose a lot of time, lose expertise, and in the whole ecosystem we have some venture capital, which finances SMEs in a very limited way....*

*The incentives to externalize projects are the heart of our business model (at CRIM)...*

*Firms give us research and development contracts, but it must be in their culture to share their real problems, that they can't solve all by themselves. It is not a natural process for several firms. It can be an obstacle to innovation....*

*We try to anticipate what will be the demand for new products and technologies in the next three years.”*

## 6. LIMITS OF THE RESEARCH:

### Reasons why firms do not develop more cross-fertilization (2)

- A large video games firm explained that they would like to have more collaboration with SMEs.
  - SMEs tend to be afraid of large firms because they can be copied, their ideas or their human resources can be stolen.
  - Developed a more formal collaboration project with District 3, the Concordia accelerator,
    - ❑ to be closer to the innovation projects of startups
- Large firms can do collaboration projects with academia through research chairs or research groups.
- Several SMEs expressed their hope that it may become easier for them to join collaboration projects with academia through informal research groups.

- Medium-size firm = research pace is totally different for academia and the private sector, and often makes cooperation difficult, (if not impossible).
  - Wanted to do project in 3 months but the academic process was too long in their opinion.
  - Another medium-size firm told us academics wanted to determine the topics of the research project even though the firm wanted to investigate another research domain.
  - 2 examples show how the cooperation between academia and SMEs in particular is often difficult, objectives of the research and timelines often being different (same issue with large firm),
    - ❑ making cross-fertilization difficult between them.
  - Business model innovation can be done by large firms through knowledge management and the development of corporate universities.
    - ❑ Failure to internalize learning leads to the loss of the ability to accelerate the creation of new competitive advantages.

## 6. LIMITS OF THE RESEARCH:

### Reasons why firms do not develop more cross-fertilization (2)

- Lack of innovation in the Quebec MM-IT ecosystem = due to the relative newness of the sector and the small size of most of the firms.
  - SMEs compose the majority of the firms and possess fewer resources to innovate.
  - Those firms receive less R&D tax credits than large firms.
  - Some SMEs which innovate are also generally experiencing fast international growth through export.
  - The local Quebec market is quite small for MM-IT suppliers.
- Emergent leaders are firms between 150-350 employees with fast growth in revenues; they hire a lot of new workers.
  - The Quebec MM-IT ecosystem has only very recently nurtured those emergent leaders.
  - The main employers are not just foreign video games studios or IT outsourcers.
- Many cross-fertilization opportunities reside in :
  - collaboration between SMEs, middle-size firms and large firms; and also through
  - better partnerships with academia, research centers, and co-development with customers or suppliers.
- The interviews from our study reveal that firms that have internalized learning through those new partnerships have been able to reinforce or create competitive advantages.

# 7. CONCLUSIONS (2)

- Our results show that medium-size and large firm use a broad mix of cross-fertilization methods for innovation.
- Startups and small firms have a more limited exposure to cross-fertilization opportunities in order to foster innovation.
  - However, some smaller firms have used cross-fertilization methods for innovation with great success in their value creation.
    - ✓ i.e. co-development with customers or attending several conferences around the world often appear in our results presented above, and this appears to be an excellent source of knowledge exchange and cross-fertilization for fast growing MM-IT firms.
- Several non-business organizations in the Quebec multimedia-IT ecosystem support mainly startups and smaller firms.
  - However, there are some reliable actors in the ecosystem for all types of firms, smaller or larger, that can make a significant contribution to innovation management.

# 7. CONCLUSIONS (2)

- **There are many opportunities for cross-fertilization and exchange of knowledge for innovation among related sectors.**
  - i.e. projects in video games, serious gaming or special effects; or between IT, multimedia and arts.
  - Reappropriating technologies and ideas from the public domain or external actors, coming from the innovation projects of competitors, or suppliers, or customers, from a related sector, or from a totally different sector, are key observations.
  - Different cross-fertilization strategies are available to agile organizations that want to extract more value from their innovation management, particularly by accessing information from external actors.
- As was observed in the interviews, the *proximity of the diverse actors* in the Quebec multimedia-IT ecosystem provides opportunities for partnerships and collaboration.

# 8. FUTURE RESEARCH

- Article 2:
  - Training and the competitiveness of the Quebec multimedia-IT sector
- Submitted to the International Journal of Human Resources Development and Management

- Article 3:
  - The difficult path of startups towards becoming middle-size firms: the case of Quebec multimedia-IT firms.
- Submitted to the International Journal of Entrepreneurship and Innovation

# 9. Some Key References

- Chesbrough et al. 2006. " Open Innovation : modèle de gestion de l'innovation ". In Chesbrough, H. ; Vanhaverbeke, W. ; West, J., (eds), Open Innovation : Researching a New Paradigm, Oxford, Oxford University Press.
- CRIM, 2015, 30 years report, Centre de Recherche Informatique de Montréal, 13 pages
- Industry Canada, 2014, Canadian ICT Sector Profile, [https://www.ic.gc.ca/eic/site/ict-tic.nsf/eng/h\\_it07229.html](https://www.ic.gc.ca/eic/site/ict-tic.nsf/eng/h_it07229.html), consulted February 15, 2016
- Institut de la Statistique du Québec, 2015, Profil statistique du secteur des technologies de l'information et des communications (TIC), <http://www.stat.gouv.qc.ca/statistiques/economie/comparaisons-economiques/profils-sectoriels/profil-secteur-tic.pdf>, consulted March 17, 2016
- Melton, C.; Chen, J.C.H. and B. Lin, 2006, "Organisational knowledge and learning: leveraging it to accelerate the creation of competitive advantages," International Journal of Innovation and Learning, Vol.3, Issue 3.
- Miles, R.E. et al., "Organizational strategy, structure, and process," Academy of Management Review, 1978, July, 546-562.
- [Pastuszak](#), Z.; [Shyu](#), SHP;; [Lee](#), T.R.; [Anussornnitisarn](#), P. and [O. Kaewchur](#), 2012, "Establishing interrelationships among organisational learning, innovation and performance," International Journal of Innovation and Learning, Vol. 11, Issue 2.
- Rhéaume, Louis and M. Gardoni, 2017, "Infocom business models innovation with the development of corporate universities," International Journal of Innovation and Learning, 16 pages
- SECOR 2014, Rapport pour l'Alliance Numérique, Perpétuons le miracle québécois: l'avenir de l'industrie du jeu vidéo au Québec, 79 pages
- TechnoCompétences, 2015, Report, Diagnostic sectoriel de la main-d'œuvre des TIC au Québec, 103 pages
- TechnoMontréal, 2015, Summary report, Une société numérique au cœur de notre prospérité collective, 4 pages
- Tremblay, Diane-Gabrielle. (2014). L'innovation technologique, organisationnelle et sociale. Québec : PUQ.
- Trott, P. & Hartmann, D. (2009), Why 'Open Innovation' Is Old Wine In New Bottles, International Journal of Innovation Management, December, Vol. 13, No. 04 : pp. 715-736.

# Contact us:

Louis Rhéaume, PhD

- [louis.rheaume@teluq.ca](mailto:louis.rheaume@teluq.ca)
- LinkedIn: [ca.linkedin.com/in/louisrheaume/](https://ca.linkedin.com/in/louisrheaume/)

Diane-Gabrielle Tremblay, PhD

- [Diane-gabrielle.tremblay@teluq.ca](mailto:Diane-gabrielle.tremblay@teluq.ca)



# 10. Questions?