ICT networks and clusters in Quebec

Catherine Beaudry, Laurence Solar-Pelletier
Georges Hage, Bassirou Diagne
Polytechnique Montreal
Objectives of the project

- Role of intermediaries
  - Nurturing greater number of firms
  - Accelerating research-to-commercialisation
- Importance of cluster
  - Their place in GPN GIN? Still pertinent?
- Role of universities within clusters
  - Extent of research collaboration
  - Perception of firms about training
- Local and international links
  - Local collaboration
  - Spread of international network
Methodology

- Case studies
  - 6 interviews with intermediaries
  - 7 interviews with firms
- Initially focused on hardware...
- Inform a questionnaire based approach to be launched in the coming year
Innovation intermediaries
Intermediaries

- 6 intermediaries were interviewed
  - **Int-A**: Tech univ-firm collaboration (commercialisation)
    - Piloting and commercialisation of ICT
  - **Int-B**: Tech univ-firm collaboration (funding)
    - Research infrastructure; problem-solution matchmaking
  - **Int-C**: Help SMEs (understand and adopt ICT)
    - SME can be active participants or test fields for services or process innovations
Intermediaries

- 6 intermediaries were interviewed
  - **Int-D**: Help companies in the start-up phase
    - Commercial services (market research, integration of external consultants, seminars, customer service)
  - **Int-E**: ICT univ-firm collaboration (funding)
    - Research infrastructure; problem-solution matchmaking
  - **Int-F**: University technology transfer office
Collaboration

- Int-B has a vast network of collaborators to help small firms grow
  - From universities to external consultants (including entrepreneurship academics)
  - From local development centers to national associations
- Int-B helps firms identify
  - Identify their innovation problems
  - Find the right resources (financial, human or material) to solve their problems,
  - Get strategic advice
Collaboration

- Int-C helps SMEs
  - Understand new usage of ICT, adopt new ICT usage
  - Provides them with services targeted to their needs (ex: training)
  - Offers occasional for financing
Collaboration

- Int-D has a vast network of collaborators to help small firms grow
  - From universities to external consultants (including entrepreneurship academics)
  - From local development centers to national associations
- Int-E often works with collaborators that already know each other
  - They bring new themes and the organisation helps them liaise with other partners and specific expertise (the organisation’s university extended network)
Collaboration

- Int-F presents technologies to large international firms with whom the organisation has developed a trust relationship
  - The development of new firms and the licensing of technologies are its strengths
  - “The government suggests that we use Canadian partners but they are currently hard to find. For example, Blackberry were involved in many projects before its financial situation declined”
Open innovation

- Int-A uses OI in their partnership management to provide services to their clients - they help SMEs
  - Get in contact with larger suppliers, find financing
  - Get contact with organisations that can help them in their innovation process (accreditation, protection of intellectual property, etc.)
  - Get in touch with academia, build their first prototype, fine tune their innovation process
- Int-B uses OI in web tools to find equipment, problems to solve or solutioners
- Int-C uses OI to gather people around a topic of common interest and organise research on the topic
- Int-E states that Quebec is not competitive regarding opening up to international digital networks
Open innovation

- Int-D believes that in the health field, open innovation allows well organised attraction poles - some hospitals use OI for software development.
- Int-E states that Quebec is not competitive regarding opening up to international digital networks.
  - In 5G, critical mass along the Quebec-Ontario corridor with technologies, infrastructures, trial centers to test and appropriate the technologies well integrated and connected internationally is absolutely essential.
- As a university tech transfer office, open innovation takes the form of an external path to market for university technologies.
  - But not without strong IP protection.
Public policies

- Industrial Research Assistance Program (IRAP) and Scientific Research and Experimental Development (SR&ED) Programs are crucial to Int-A and Int-B
- Help to tap into international digital networks will be a competitive advantage, but a major obstacle if lacking in scope (Int-E)
- Int-F notes the increasing presence of serial inventors
- Help promote our talent
  - We have some of the best researchers in Optics/Photonics, in AI/OR but nobody knows about it…
Firms
Firms

- **Firm-1**: Canadian SME
  - Designs and manufactures hardware for the entertainment industry
- **Firm-2**: Canadian SME
  - Security software and hardware
- **Firm-3**: Canadian SME
  - Hardware and software in the telecommunication industry
- **Firm-4**: International entreprise
  - Hardware and software in the telecommunication industry
Firms

- Firm-5 Large Canadian firm
  - Telecommunication hardware and software
- Firm-6 Large international entreprise
  - Hardware and software
- Firm-7 Canadian firm
  - Aerospace and instrumentation hardware

Most of these firms specialize in high end products
Firm networks

- **Clients**
  - Canada: Firm-4, 5 and 7 most of their clients are in Canada (aerospace, telecommunication)
  - Firm-1: 50 / 50 Canada and International
  - Firm-2, 3 and 6 mostly international, especially in USA and Europe

- **Suppliers**
  - Many firms try to work with local suppliers
  - International firms (4, 6) rely less on local suppliers, because of foreign headquarters
  - In any case, many suppliers outside Canada
Firm networks

- Competitors
  - International competition
  - Asia (China) for mass production
  - USA and Europe for high end products
Firms innovation practices

- Innovation in firms
  - R&D is a major activity in all firms, either large or small, local or international
    - All interviewees said that they have to do a lot of technological innovation in order to stay competitive internationally
Collaboration

- All firms have projects with universities: research projects, internships, MITACS
  - Sometime via intermediaries networks
  - Those projects are mostly in TRL 1-4
  - BUT NOT on their core activities: IP and, for some, for security reasons (raises interesting challenges for data sharing...)
- No major collaboration with other clients, competitors or suppliers - occasional/sporadic
  - Firm-4 and 5 innovated together on a specific project
  - Firm-1 and 6 use data from their client in order to innovate
Why Quebec?

- Firm-1, 2, 3, 7: founded by Canadians
  - Coming from Canada help business (good branding and visibility, easier to export in some countries)

- All firms
  - Specialised and qualified labor force
  - Easy access to some universities research centers/professors
  - R&D tax credits
  - Around Montreal: strong TIC ecosystem

- Negative aspects
  - Labor force shortages
  - Not enough R&D incentives
Public policies

- What do firms have to say about public policies?
  - China is having unfair competition practices
    - Especially state-owned enterprises
    - What can our government do about this?
  - R&D tax credits are nice, but not enough
    - SMEs need help with commercialization
  - Canada’s lags behind in terms of technology in the telecom industry
    - Government should push for the most recent technology (ex.. 5G)
Future of ICT

◉ According to Int-A, “in the US, 1$ for R&D equals to 2$ invested in the commercialization of a product. We can’t say the same for Canada since it’s only focused on R&D.”

◉ Hardware? Convergence hardware software?
  ◦ That is so yesterday!
  ◦ The industry is changing too fast and we have to change direction for this research project
    ◦ Providing integrated solutions is what it is all about
Future of ICT

- Int-A explains that firms that provide collaborative platforms combine hardware and software
  - It is increasingly difficult to separate the two
- Int-E believes that it is still possible to develop hardware expertise in Quebec
  - Although hardware is hidden in software applications but it will always exist
Future of ITC

What did firm had to say about the future of the ITC hardware industry in Canada?

- First of all: Canadian firms need to combine hardware and software if they want to be competitive...
- Firms have to focus on high-end products
- Important pool of young entrepreneurs and labor force
- Good universities, with some world renowned academics
- So, overall, yes, Canada can have a strong ITC hardware/software industry
Future of ICT

- It seems that the gaming industry receives all the attention and money (Québec) - now it is an AI buzz...
  - Int-B affirms that Mtl’s strength in data analytics, Big Data and quantum computing is a major asset
  - ITC sector includes many more application sectors!
  - Is the future in sectoral applications?
Thank you

Questions? Suggestions?