

# Ottawa's Telecommunications and Photonics Industries: Second Generation Clustering Issues

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# Outline

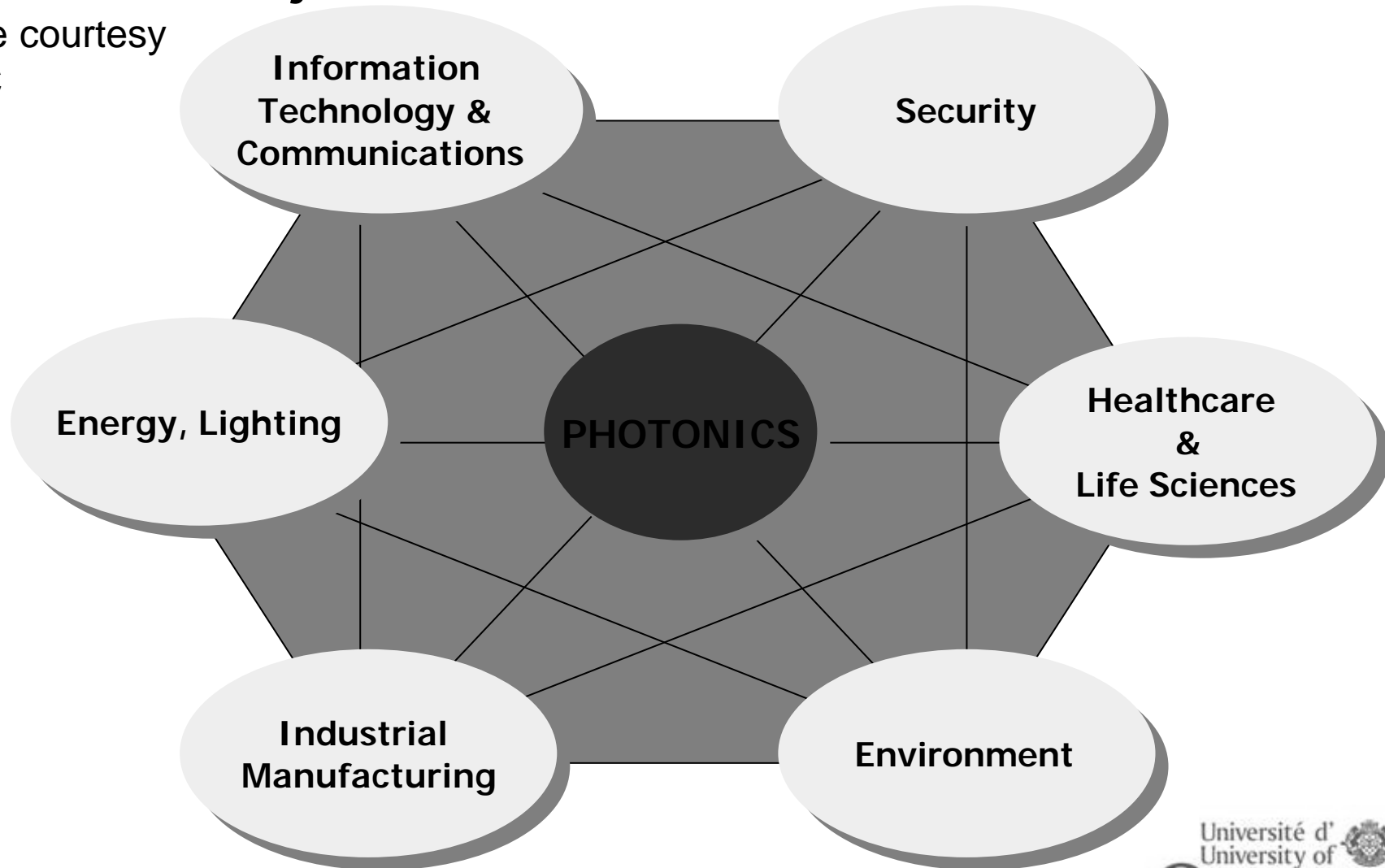
- Welcome to Ottawa!
- Photonics and Telecommunications Industries
- Firms
- Generational Clustering Issues
- Research Results
- Future Work

# Photonics

- An enabling technology
- No NAICS code for Photonics
- At the industrial level, photonics has been led by telecommunication
- Key here is industrial and/or product diversification
  - Injection of variety in the evolutionary system
  - Development of BioPhotonics etc.
- Tremendous government intervention internationally
  - Germany
  - Australia
  - United Kingdom

# Major Sectors in Photonics

Slide courtesy  
CPC



# Telecommunications

- Continued struggle to reorganize and ‘right-size’
- Carrier revenues have continued to grow steadily
  - However, debt and long-haul overcapacity remain a great obstacle to speciality equipment manufactures
- Growth continues to be predicted based on the development of new applications to use up the bandwidth that is available
- Still significant Venture Capital lingering in firms
  - Slowing of the ‘burn rate’

# Spending by Canadian Telecommunications Service Providers

(thousands of dollars)	1999	2000	2001	2002	% Change 2001-02
<b>Wireless Capital Expenditures</b>	4,258.7	2,005.7	2,642.4	1718.3	-35.0
<b>Wireline Capital Expenditures</b>	1,374.0	4,989.9	5,078.7	3979.5	-21.6
<b>Total Capital (wireless and wireline) Expen.</b>	5,632.7	6,995.6	7,721.1	5,721.1	-26.2

Statistics Canada: Telecommunications Surveys

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# Firms

- Q1 2003, first profit in three years for Nortel Networks
  - Stock price has risen by 544% since October 2002
    - However, it has lost approximately 97% of it's value since July 2000
  - Sales still continue to decline
    - Operating loss
- Rumours of JDS Uniphase's complete departure from Ottawa
  - Rejected by the firm, still 860 employees locally
- Alcatel with approximately 2,500 local employees
- Total Tech-based employment stands at about 57,000, which is 12,000 less than its peak in 2000 (Statistics Canada)

## Firms (cont.)

- Few bankruptcies yet...
- Some start-ups continue to have success in the VC market
  - Catena Networks, \$75 m in 2002 (fourth round) bringing their total to \$300 m
    - Founded in 1998
    - Plan to be the next \$1B (revenue) firm by 2008 and IPO + 1000 new employees
- March Networks and Mitel Networks (Terry Matthews firms)
  - Government (TPC) funding of up to \$60 m for collaborative R&D between the two firms with the hope of creating 900 new jobs
  - March reduces its staff by 40% to 100 last week



# Generations of Clustering Issues

- First Generation Clustering Issues
  - Do you have a cluster?
  - How do you create a cluster?
    - Institutions, Money, People
- Second Generation Clustering Issues
  - Let us assume a cluster...Critical Mass
  - Are the resources of the cluster being adequately used?
    - Managerial Dynamics

**Question Ten: Please indicate the importance of the following external source(s) of innovative ideas for your establishment? (where 1 is not important and 5 is very important)**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
Parent or affiliated companies	0	0	2	2	1	5
Suppliers	12	5	5	2	6	30
Customers	0	1	4	2	23	30
Competitors products or services	4	1	13	8	4	30

**Question Ten: Please indicate the importance of the following external source(s) of innovative ideas for your establishment? (where 1 is not important and 5 is very important)**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
Private R&D institutes and consortia	20	4	3	1	2	30
Local Universities Research	19	6	1	2	2	30
Non-local University Research	18	4	4	3	1	30
Other public research institutes	18	2	4	2	4	30
Informal discussion with researcher	12	6	8	1	3	30
Academic or professional consultants	15	2	8	4	1	30
Civic associations	24	2	0	3	1	30
Venture capitalists	19	4	2	2	3	30
Legal/financial services	22	2	3	1	2	30
Acquired businesses	1	2	4	1	3	11

**Question Thirteen: How would you rate the relative importance of these factors? (where 1 is not important and 5 is very important)**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
Co-location with other firms in related industries	7	2	9	6	6	30
Physical, transportation or communications infrastructure	7	6	6	5	6	30
Availability of financing	9	5	2	6	8	30
Specialized research institutions and universities	12	5	2	10	1	30
Specialized training or educational institutions	11	9	4	4	2	30
Presence of key suppliers or customers	6	6	6	6	6	30
Government policies or programs	8	3	6	7	6	30
Existence of a local focus and vision for your industry	23	1	1	2	3	30
Other	3	3				6

# Responses from Interviews

- Why are the firms here?
  - The founders were here (born or relocated) – the result of critical mass and age of the cluster
  - Research hub
  - Anchor firms (Nortel especially)
- Predominance of local capital (both personal and through networks of angel investors)

05.01.03 – The horrible terms of Venture Capital

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# First to Second Generation

- Excellent to connect individuals, however, this alone does not produce success
- Generations and life-cycles
  - Large firms become streamlined in terms of their activities in heavy growth stages
    - Connections to universities neglected
    - A persistent view of universities with long-term research orientations
  - Need for University research to be constant and consistent

# First to Second Generation

- Canadian Photonics Fabrication Centre
  - Too little too late?
  - The need for government facilities to mirror those in industry for them to be useful
  - Acquisition of equipment as a result of the closing of industry labs
  - Participation of Universities
- Will industry be able to recover the research capacity it continues to lose?
- Need to not rest on leadership position but to expand and develop in technology-based clusters
  - Quickly moving technologies and product cycles
  - Strategic investments being made around the world

# First to Second Generation

- Moving away from a regional-centric view to an industrial or knowledge focus
  - International connections between clusters
    - Global production of knowledge
    - Partially driven by competing government incentive programs that are unlikely to change
- Multiple levels of industry and/or clustering organizations
  - How to eliminate confusion and add value?



# Sample of Events

- This week
  - Regional Innovation Forum Roundtable (NRC)
  - Smart City Summit 2003
  - Optoelectronics Microsystems International 2003 Conference, April 28-May 1
  - Delegation from Arizona
- OCRI
  - 13 other events...just for April

# OCRI

- Tremendous attention and tremendous pressure, not necessarily reflective of it's funded mandate
- Brokering of connections
  - Global marketing activities
- Entrepreneurship Centre
- Continued promotion of the region internationally

## OCRI (cont.)

- Strategic source of information
  - Entering US markets
  - Building Corporate Board of Directors
  - Technology seminars
- University open houses
  - Getting the research known in the community
- Inventory of the capabilities available the business community

# Management Dynamics

- Path-dependency of entrepreneurship
  - Recall the different paths of Silicon Valley and Route 128...
  - How will the technological knowledge be adapted to produce new products with large consumer markets?
  - In England, Sheffield's capabilities in steel did not translate into industries that used steel as an input (automobiles, aerospace etc.)

# Management Dynamics

- Need for effective corporate boards
  - Not enough qualified individuals for the 1400 firms
  - Denzil Doyle would say that this is to be addressed through better financial infrastructure not increased training activities
    - Have been events on this topic organized by OCRI
- This leads to issues of IPO's and growing firms
- Growing firms to global levels will also require partnering between technology firms and financial institutions in order to achieve the necessary mass
  - Newbridge Networks

# Future Research and Work

- Beginning to interview with the major local players
  - Nortel Networks
  - JDS Uniphase
  - Mitel Networks
- New round of interviewing later in May
  - Second offering of Ottawa's Technology Clusters course
- Culmination of the CATA TechAction Town Hall Meetings
  - Continued work with data from this series
- Exterior connections to the cluster – Raleigh-Durham, Arizona etc.



# Thank you!

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**Question Nine: For your company what is the relative importance of the following sources of innovative ideas for your product, service and process development? (where 1 is not important and 5 is very important)**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Total</b>
Research and Development Unit	1	1	4	6	18	30
Design Unit	4	2	6	3	15	30
Production and Engineering Unit	9	3	7	2	9	30
Marketing	3	2	7	7	11	30
Management	2	2	3	9	14	30
Other					6	6