The Ministry of Economic Development, Employment & Infrastructure
The Ministry of Research and Innovation

***Partnerships for Jobs and Growth Act*: Ontario's Digital Cluster Opportunities**

Presentation to CDO Ottawa

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# *Partnerships for Jobs and Growth Act*: Ontario's Digital Cluster Opportunities

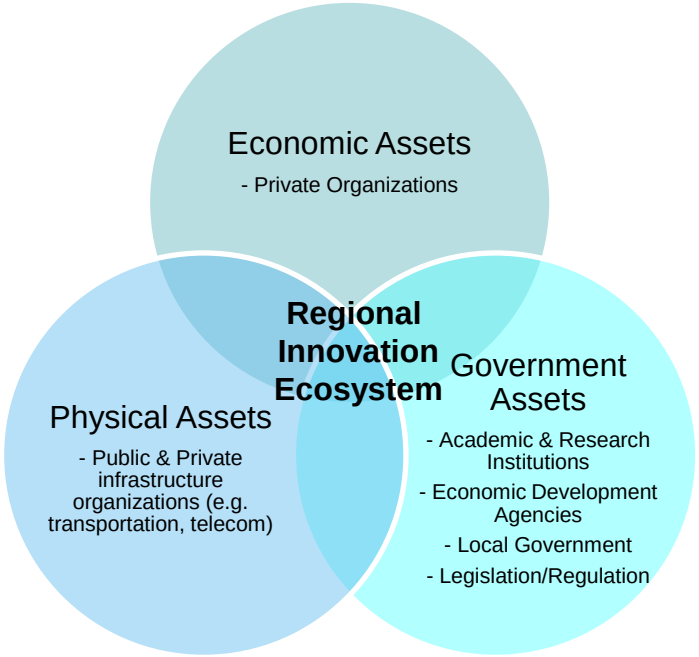
Purpose:

To provide an overview of:

- *Partnerships for Jobs and Growth Act* ("cluster legislation")
- Ontario's key Information and Communications Technologies clusters
    - Mini-case study – Toronto's 'wearables' cluster

# How clusters grow Ontario's economy

- The *Partnerships for Jobs and Growth Act* (**PfJGA) provides a framework for identifying action required by industry and government** to facilitate regional economic development.
- Growing Ontario's strongest **clusters supports productivity, innovation and export competitiveness (PIE)**.
- Cluster Plans will **target both established and nascent clusters**.
- Cluster development **addresses the entire ecosystem**: including Economic Assets, Physical Assets and Government Assets.



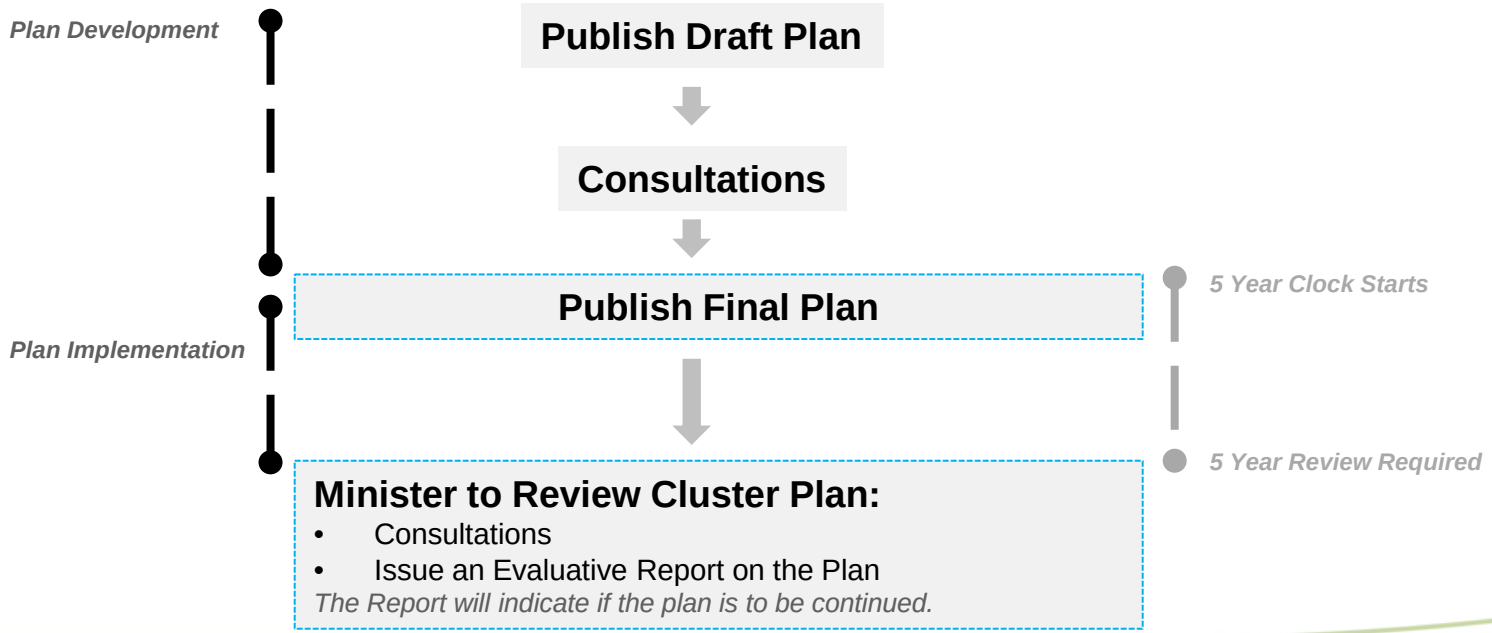

- Clusters leverage the unique capabilities and assets within a region by **encouraging greater collaboration to foster knowledge exchange, resource sharing and experimentation** to build a "Regional Innovation Ecosystem".

# What we mean by clusters

- The *Partnerships for Jobs and Growth Act* defines clusters as "**geographically concentrated groups of interconnected businesses and related entities** that stimulate economic development by increasing productivity, innovation and competitiveness"
- MEDEI identifies two types of related, but distinct cluster opportunities:
  - **Traditional sector-based clusters** that are regionally concentrated groups of interconnected businesses and related entities within a particular industry
  - **Cross-cutting, technology-based clusters** are associated through established and nascent technologies (such as 3D Printing, Mobile, or Big Data) that could lead to innovation and productivity improvements across a number of industries

# How the *Partnerships for Jobs and Growth Act* works

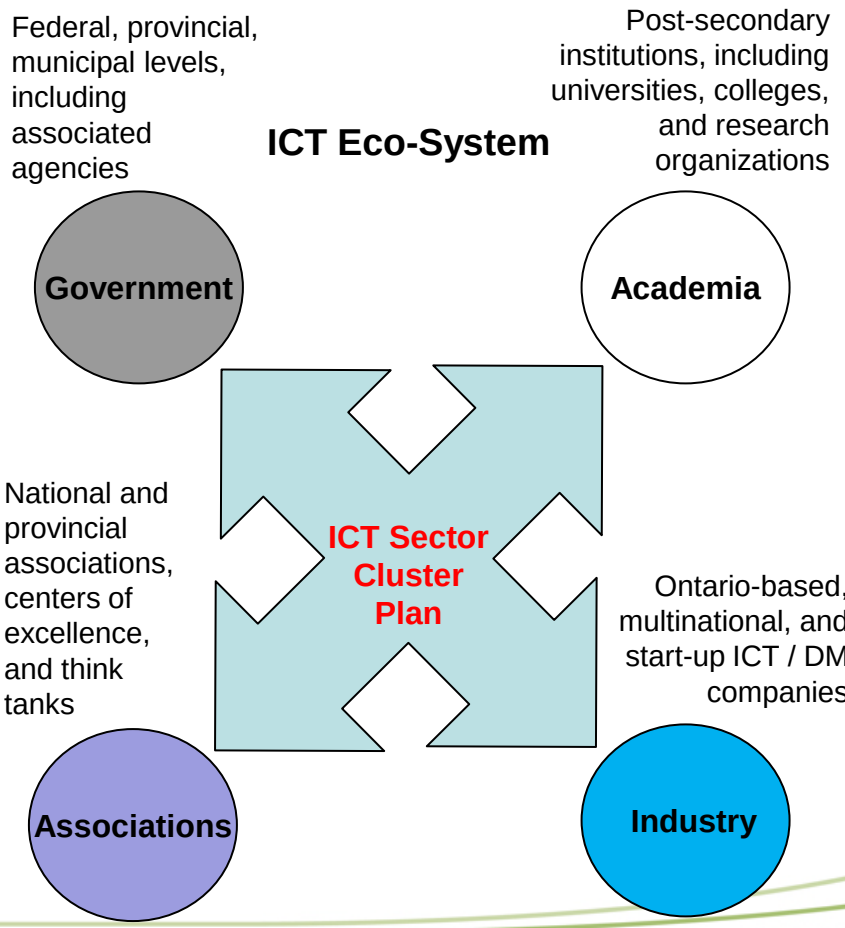
The *Partnerships for Jobs and Growth Act* was introduced to set out a legislative process for government to meaningfully collaborate with industry on cluster development planning in an open and transparent manner, specifically:



# Building the ICT eco-system

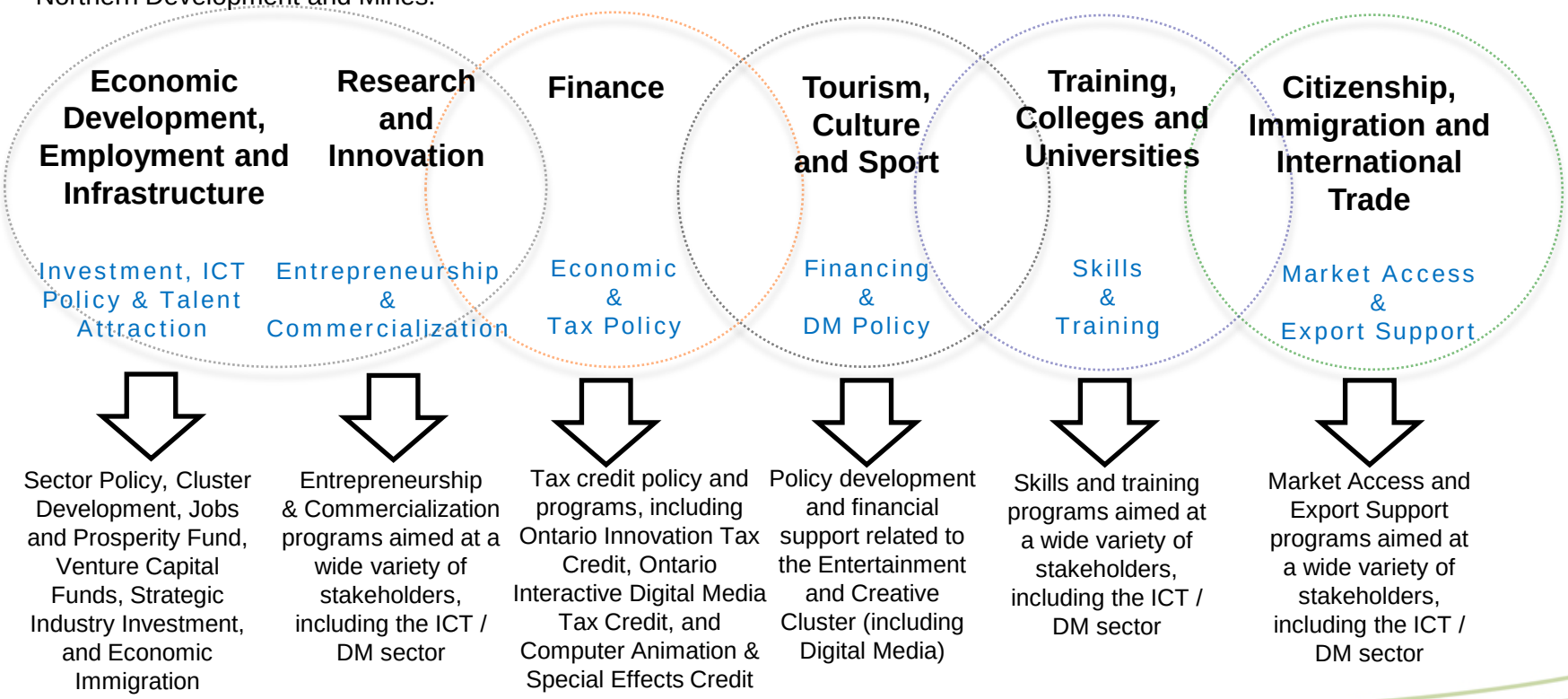
Though government plays a crucial role, **a healthy eco-system requires all the actors in the sector to work together to reach its maximum potential**.

- **Government**, including federal, provincial and municipal levels, provides a variety of policy, program and regulatory assistance to the sector directly and indirectly through the other pillars.
- **Academia** trains highly-skilled knowledge workers, conducts leading-edge research and development, and provides evidence-based advice to government.
- **Industry**, including companies in the broader Ontario economy, creates and commercialize innovative products and services in a dynamic and global marketplace.
- Industry **associations**, including sector organizations which provide sector leadership, facilitate knowledge sharing, and develop sector intelligence.



# Bringing a ‘whole-of-government’ lens to Ontario’s ICT sector

Though MEDEI plays a crucial role in developing Ontario’s Information and Communications Technologies (ICT) / Digital Media (DM) clusters, a variety of ministries work in unison to build a strong and growing eco-system. Other ministries, not identified below, also provide vital support such as Education, Government and Consumer Services, Health and Long-Term Care, and Northern Development and Mines.



# Industry-led consortia will drive cluster development in Ontario

- The Ministry is interested in working with cluster-focused consortia that are comprised of a representative cross-section of businesses and related entities, and will not work with single firms or consortia lacking meaningful industry participation.
- Cluster-based consortia should include a minimum of two firms, and at least one organization in the following categories:
  - academic or research institution
  - Regional Innovation or Sector Innovation Centres that belong to Ontario's Network of Entrepreneurs (ONE)
  - municipality, local, or regional economic development organization
  - and, where funding from government is being sought, a not-for-profit organization with a relevant mandate (potentially this could be one of the organizations listed above)
- While not required, participation by other relevant partners, such as industry associations and sectors experts, is also desirable.

# Cluster Plans will hold members of the eco-system accountable

Cluster Plans will support cluster growth by:

- Articulating a shared vision
- Facilitating collaboration amongst a broad range of players
- Leveraging policy and program levers across all of government
- Collaborating with other levels of government to support cluster development (e.g. local government and Federal funding agencies).
- Leveraging the broader ecosystem of supports (e.g. infrastructure investments and other relevant policies)
- Fostering international linkages
- Coordinating action within the cluster

Plans will include the following:

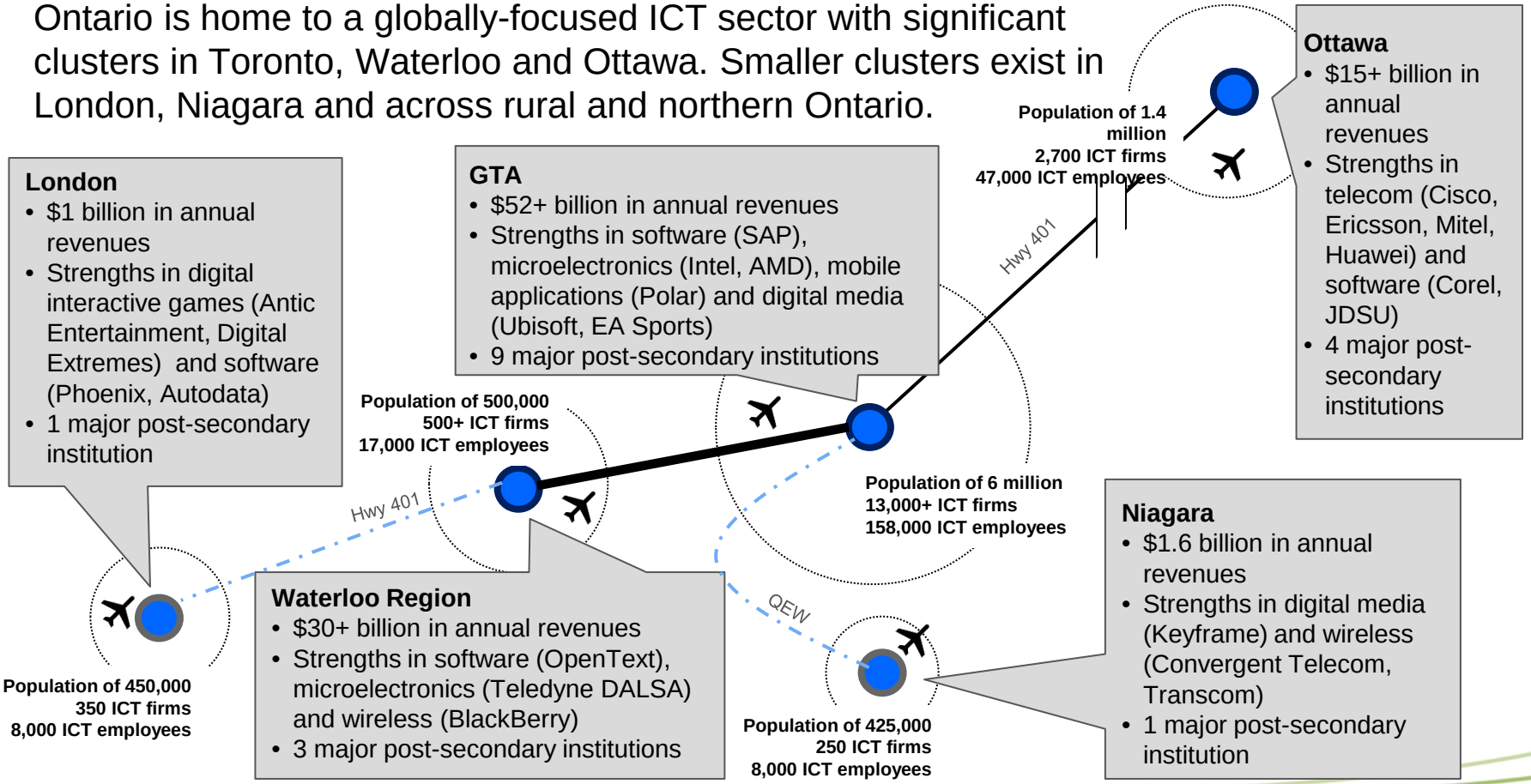
- A description of the cluster
- An assessment of challenges and opportunities with respect to the development of the cluster
- The objectives and intended outcomes of the plan
- A description of actions that could be taken by the Minister, or the businesses or other entities that form the cluster, to assist in the achievement of the objectives and intended outcomes of the plan
- Performance measures to evaluate whether the objectives and intended outcomes of the plan are being achieved

# MEDEI's role in cluster development

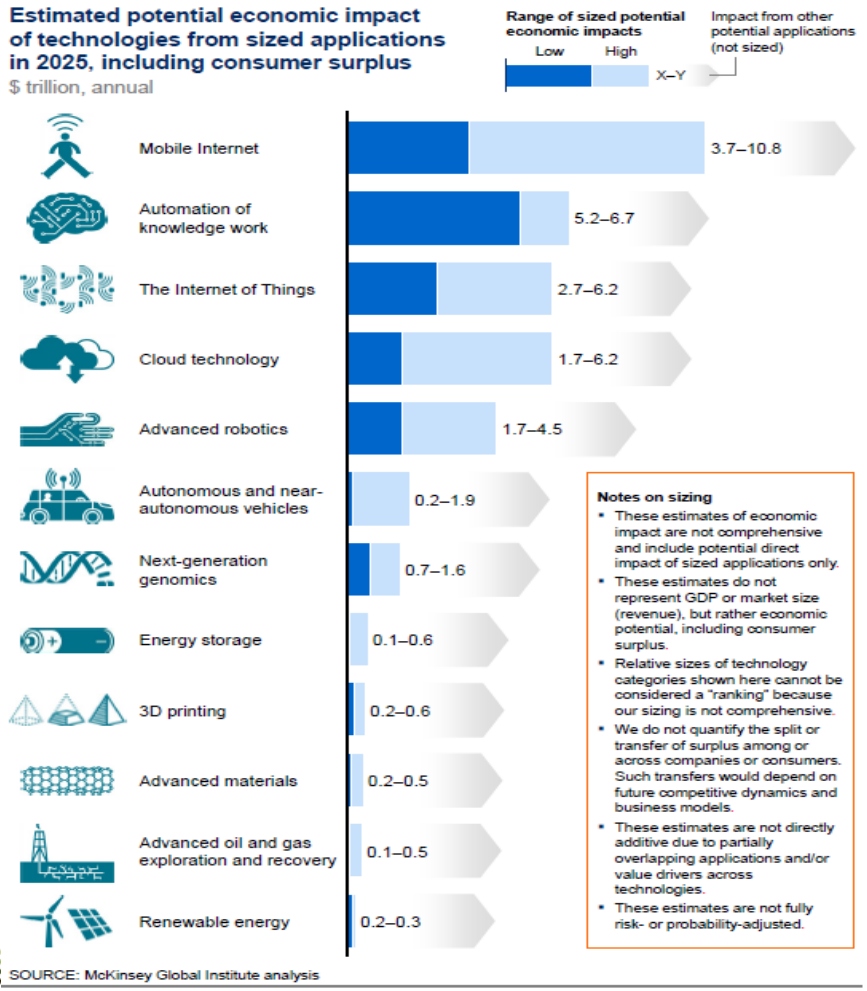
- The *Partnerships for Jobs and Growth Act* provides a mechanism for stakeholders to actively engage with government in cluster development.
- In working with consortia on cluster development planning activities, the Ministry's role could include:
  - **facilitating one-window support** to cluster consortia that have identified policy and program opportunities that fall across multiple ministries
    - ensuring an all-of-government approach to cluster success
  - **championing cluster visions** within and across other levels of government
    - ensuring government alignment with sector needs
  - **providing seed funding** to build cluster capacity
    - ensuring the capability to capitalize on opportunities

# Ontario's ICT cluster landscape

Ontario is home to a globally-focused ICT sector with significant clusters in Toronto, Waterloo and Ottawa. Smaller clusters exist in London, Niagara and across rural and northern Ontario.



# Cluster development and disruptive technologies




Current MEDEI initiatives to support cross-cutting, technology-based cluster planning:

### Strategic Partnerships

- The Ontario government is looking into investment opportunities in Ontario-based disruptive technology platforms, such as advanced manufacturing, 3D printing, Internet of Things, and genomics.
- Partnerships would be developed through industry-led consortia.

### Industrial Profiles

- MEDEI, as part of a broader industrial strategy, is looking to develop technology profiles of Ontario`s priority sectors.

### Disruptive Technologies Map

- In association with FedDev, MEDEI/MRI is mapping Ontario`s capacities in disruptive technologies.

# Ontario's ICT sector – industry overview

## Overview:

- **Ontario ranks second after California in North America in terms of the number of ICT establishments.**
- **The ICT sector is the largest private R&D spender in Ontario**, accounting for 42.3% of all business enterprise research and development (BERD) expenditures.
- **ICT adoption is a key enabler to promote productivity and innovation across all sectors**, and generates an increasing share of the province's employment, trade, and GDP.
- **Over 80% of the sector's workforce possesses a post-secondary degree**.
- **The Ontario ICT sector directly employs about 200,000 people with a yearly payroll of about $18 billion**. In the broader economy, over 370,000 people in use their ICT skills across a variety of industries.
- **Ontario is home to two of the largest start-up ecosystems in the world**: Toronto and Waterloo.

## Major Homegrown Ontario ICT Companies*

| Company | Global revenue (US$M, 2013) | Headquarters | Business |
|---|---|---|---|
| **Rogers** | 12,706 | Toronto | Connectivity Services |
| **Blackberry** | 6,810 | Waterloo | Mobile Computing |
| **Celestica** | 5,796 | Toronto | Electronics |
| **OpenText** | 1,363 | Waterloo | Software |
| **Constellation** | 1,211 | Toronto | Software |
| **softchoice** | 1,006 | Toronto | Software |
| **Mitel** | 612 | Ottawa | Communication Equipment |
| **sandvine** | 106.5 | Waterloo | Communication Equipment |

## Quick Facts

**$30.8 billion**
Sector's level of GDP in Ontario

**5.3%**
Sector GDP as a % of Ontario GDP

**203,000**
Sector's Level of Employment in Ontario

**~19,000**
Sector's # of enterprises/firms in Ontario

## Ontario's Leading ICT Clusters

| Sector | Cluster Ranking** | | |
|---|---|---|---|
| | 1st | 2nd | 3rd |
| ICT-Manufacturing | Toronto | Ottawa | Kitchener-Waterloo |
| ICT-Services | Toronto | Ottawa | Kitchener-Waterloo |

**Source:* MEDEI analysis
**Ranked by North American Establishment Location Quotient

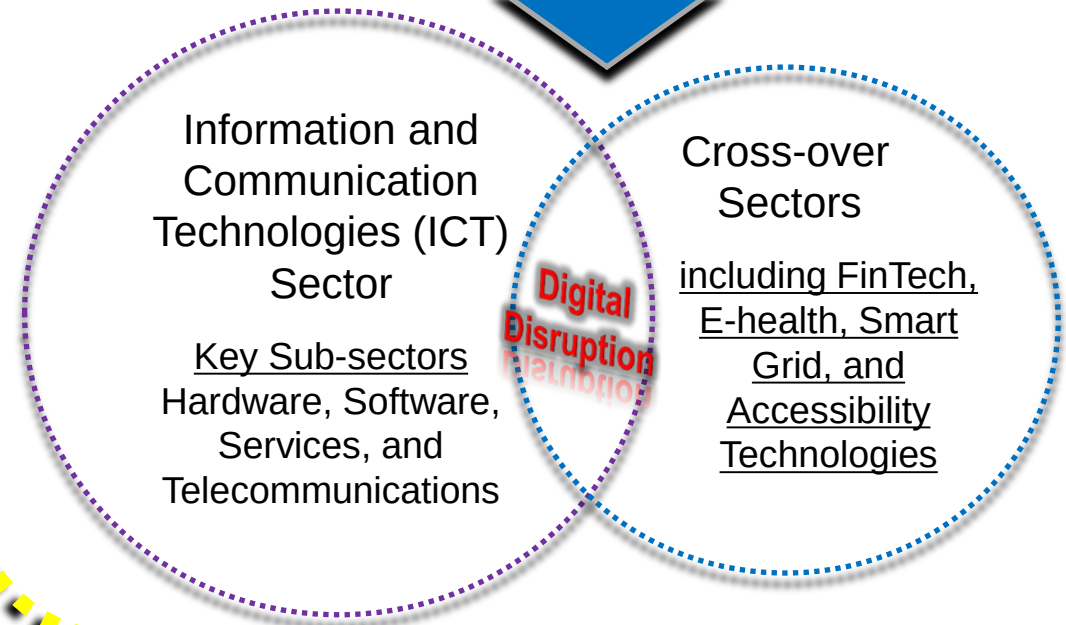
# ICT's impact across the broader economy

## ICT PRODUCING

Cluster growth is dependent on the development, creation and distribution of innovative ICT products and services within a global marketplace.

## ICT USING

Considerable productivity gains can be made through widespread ICT adoption across the economy.

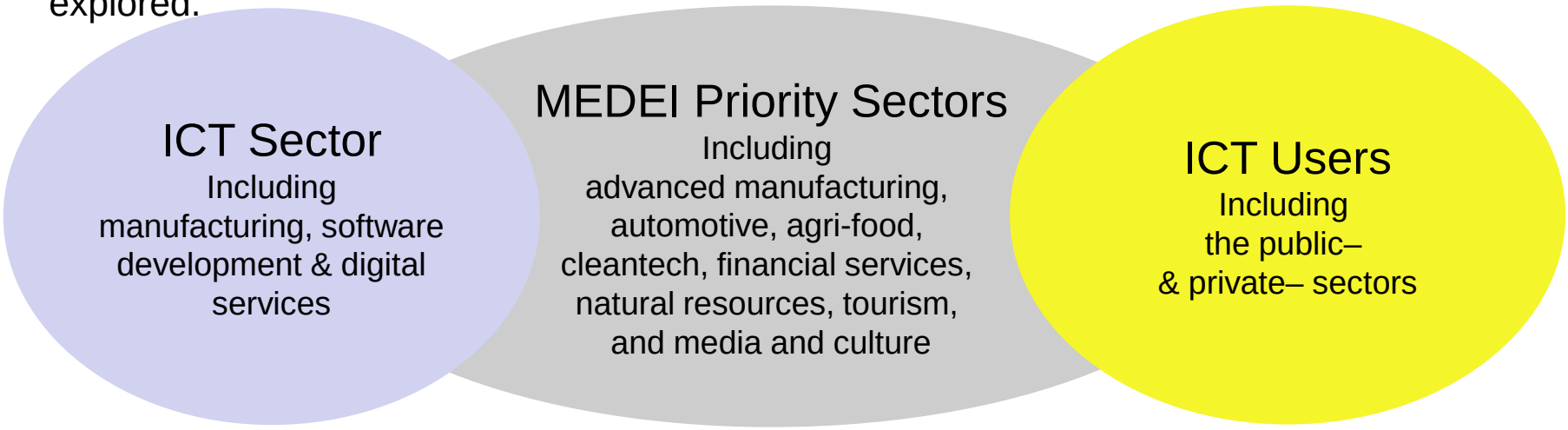



## Public and Private Sectors

**Ontario has** one of the most diversified economies in North America with **extensive opportunities to implement ICT solutions which would improve the quality of life and economic opportunities for its citizens**. The potential for increased prosperity will depend on availability of capital, access to talent and the creation of a wide-spread innovation culture

# Preliminary ICT Cluster Opportunities

Based on an evidence-based framework (including metrics such as ‘state of readiness‘, ‘market potential’ and location quotient) the following ICT related clusters are being explored.




- Waterloo – Toronto ICT ‘Super Cluster’
- Ottawa ICT Cluster
- Cross-cutting ‘Internet of Things’ Cluster
- Cross-cutting ‘WearableTech’ Cluster

# *Partnerships for Jobs and Growth Act*: Ontario's Digital Cluster Opportunities

# Thank You

If you are interested in learning more, or would like to discuss a particular cluster opportunity…

Partnerships for jobs and economic growth: How to partner with the Ontario government to develop a plan to grow your industry.

http://www.ontario.ca/business-and-economy/partnerships-jobs-and-economic-growth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|---|---|
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# APPENDICES

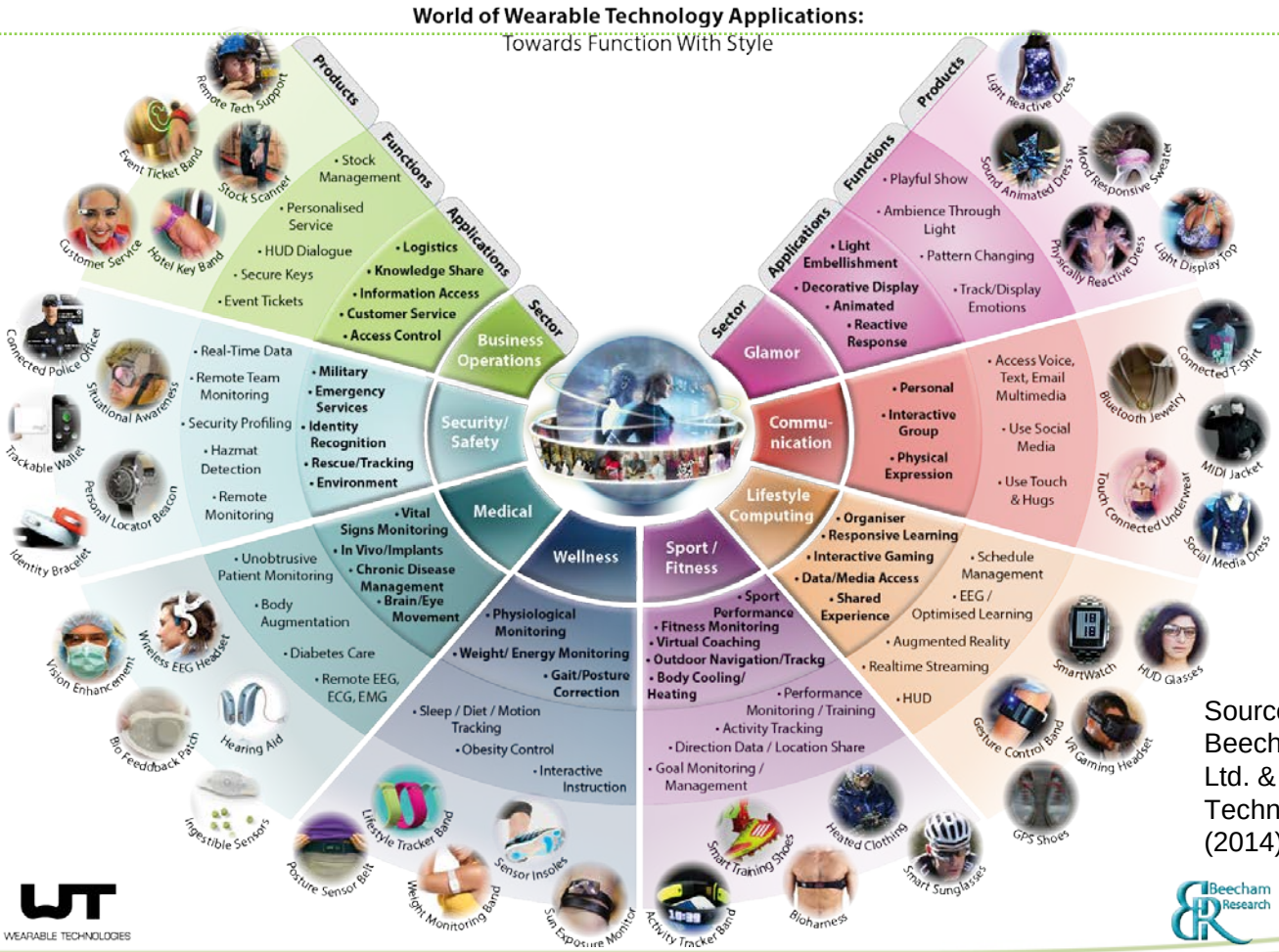
# Wearable ICT Cluster - Opportunities

Worldwide Trends:

- Wearable unit sales in 2014 are estimated at 21 million units, up nearly 240% from 2013 (6.2 million units).
- By 2018, total unit sales of wearables are expected to reach 114 million.
  - Wrist-worn wearable devices (including bands, bracelets and watches) will account for nearly three-quarters of all wearable products.
  - Globally the wearables market is predicted to grow from $3.6 billion in 2014 to $33.7 billion by 2018.

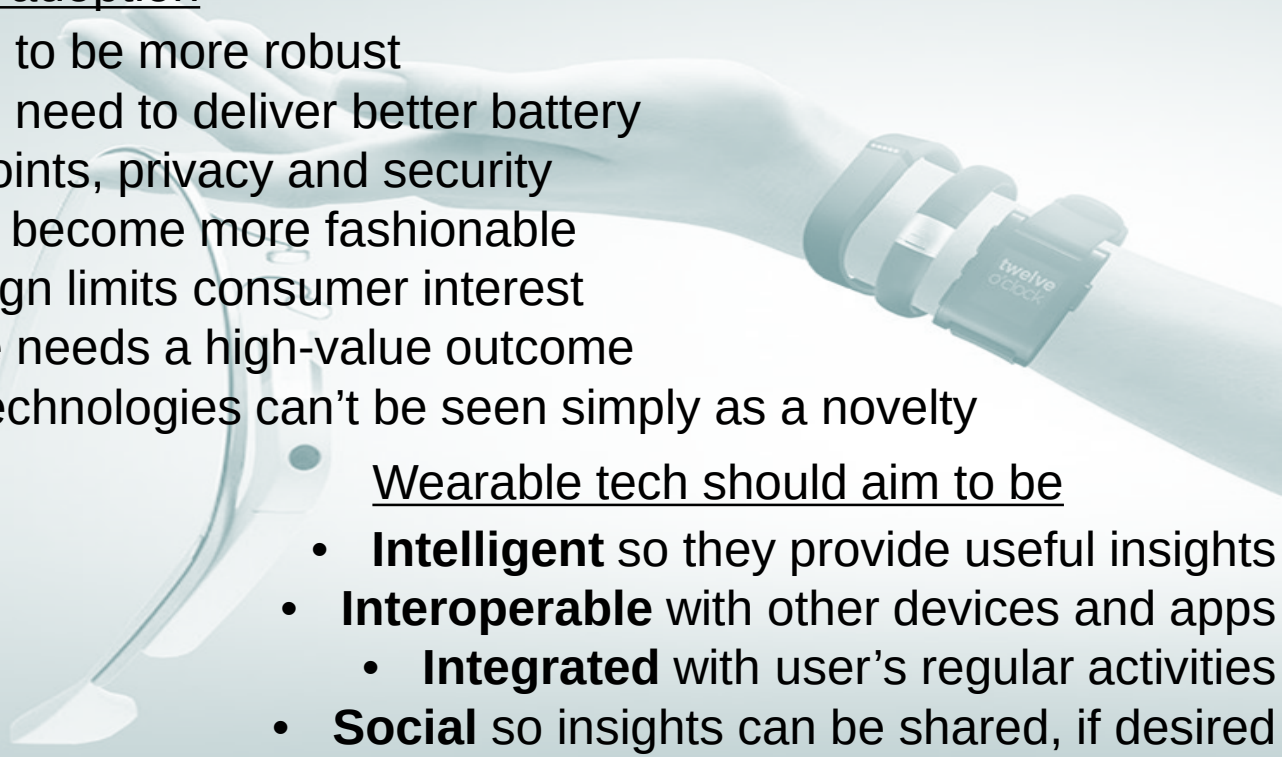
IDC, Worldwide Wearable Computing Device 2014-18 Forecast Update, December 2014

# Wearables Technology Map




Source:
Beecham Research Ltd. & Wearable Technologies AG (2014)

# Wearable ICT Cluster – Adoption Challenges



Obstacles to broad adoption

- Wearables need to be more robust
  - devices will need to deliver better battery life, price points, privacy and security
- Devices need to become more fashionable
  - limited design limits consumer interest
- User experience needs a high-value outcome
  - wearable technologies can't be seen simply as a novelty

Wearable tech should aim to be

- **Intelligent** so they provide useful insights
- **Interoperable** with other devices and apps
- **Integrated** with user's regular activities
- **Social** so insights can be shared, if desired
- **Engaging** so users will adopt them over the long-term

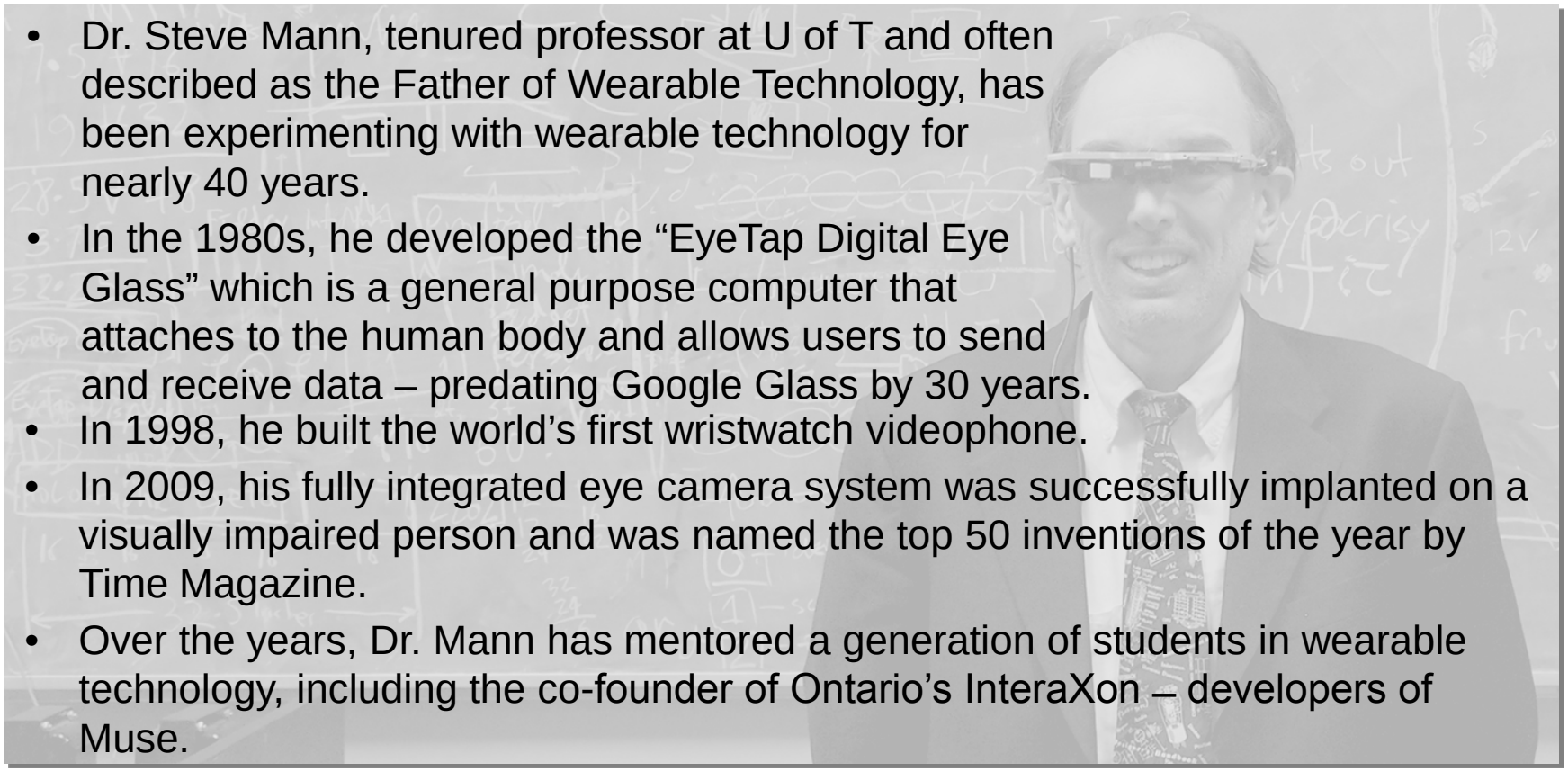
IDC, Canadian Consumer Wearables 2014-18 Forecast, May 2014; PWC, "Health wearables: Early days", 2014

# Wearable ICT Cluster – Ontario's wearable tech companies

- Toronto-based Nymi has created a wrist band that uses an individual's unique cardiac rhythm to authenticate identity, and has announced a pilot program with Mastercard and RBC to use the device to verify payments.
- InteraXon of Toronto has received $7.2 million in funding to develop and launch Muse -- a brain-sensing headband that uses seven EEG sensors to track health and well-being.
- Thalmic Labs of Kitchener has created Myo, a gesture-based armband.
- Other notable Ontario wearable startups include Bionic Concepts (wearable robotic gadgets, Bionik Labs (biomechatronics), Code4Armour (band for First Responders), eSight (digital eyewear for the blind), Fuelwear (heated clothing), Kiwi Wareables (motion recognition), Lynxio (digital knee brace), Onyx Motion (digital coach), PUSH (weight lifting), and Subpac (tactile audio).
- Toronto is also home of an active wearable community, such as the MaRS, Wearable Toronto and OCAD University.

Source: The Globe and Mail, "Why Toronto is a hotbed of pioneering wearable technology", January 15, 2015

# Wearable ICT Cluster - Toronto's long history in a new technology platform



- Dr. Steve Mann, tenured professor at U of T and often described as the Father of Wearable Technology, has been experimenting with wearable technology for nearly 40 years.
- In the 1980s, he developed the "EyeTap Digital Eye Glass" which is a general purpose computer that attaches to the human body and allows users to send and receive data – predating Google Glass by 30 years.
- In 1998, he built the world's first wristwatch videophone.
- In 2009, his fully integrated eye camera system was successfully implanted on a visually impaired person and was named the top 50 inventions of the year by Time Magazine.
- Over the years, Dr. Mann has mentored a generation of students in wearable technology, including the co-founder of Ontario's InteraXon – developers of Muse.

Source: The Globe and Mail, "Why Toronto is a hotbed of pioneering wearable technology", January 15, 2015