

ONTARIO 360 – TALENT DEVELOPMENT FOR THE TECH SECTOR - TRANSITION BRIEFING

Supporting growth in Ontario's knowledge economy

Issue

The technology sector is one of Canada's fastest growing; since 2014, the Information and Communication Technology Sector (ICT) has grown 50% faster than the overall economy.¹ The sector is particularly important to Ontario where, in 2016, ICT contributed \$34B to Ontario's economy, double Quebec which was the next closest province. As a sector that inherently relies on people, availability of appropriate talent is the key driver for growth of firms in the sector. Over 82% of Ontario firms in the sector identify their ability to engage, retain, and retrain for their talent needs as the most significant challenge affecting their ability to grow.² The next provincial government will require a focused, effective, and impactful talent development strategy to ensure that firms have the people they need, as they need them, so that they can grow and meet their full potential.

Overview: Ontario's technology sector

The Ontario government has placed significant emphasis on transforming the province's economy to be more innovation-based. Ontario is not unique in this regard. Governments around the world have focused policies, and resources, in fostering innovation so that there is a global race to see which jurisdictions will become an innovation leader.

Talented individuals are to the innovation economy what mineral deposits are to the mining industry and factories are to the manufacturing industry. Talent

¹ Statista, ICT Sector Growth in Canada, 2017. Available at:

<https://www.statista.com/statistics/723975/canada-ict-sector-annual-growth/>.

² Katlynd Poutlond, "Ontario Employers Experiencing High-Skilled Employment Shortage," Mentorworks, September 6, 2017. Available at:

<https://www.mentorworks.ca/blog/market-trends/2017-09-ontario-skills-shortage-trends/>.

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underpins innovation and any strategy to grow the innovation ecosystem must have talent at its core.

The technology sector is the largest component of the innovation economy. Technology is also the foundation for innovation in the broader economy and is rapidly transforming all sectors.

The demand for technology workers is growing quickly with job growth at four times that of the overall economy.³ By 2016 there were more than 875,000 workers in the Canadian technology space ranking it fourth amongst major economic sectors. In Ontario, technology accounts for 6.2% of all provincial employment, just behind Quebec at 6.4%.⁴

Employees in the technology sector have much greater education attainment than the general population (51% vs 29% hold university degrees), have higher wages (\$67,000 vs \$48,000) while the workforce has a significantly younger profile.⁵

Toronto is the epicentre of Ontario's technology industry. In 2017, the city ranked first in North America for growth in technology jobs (22,000 net new jobs) beating traditional powerhouses such as San Francisco and New York (11,000 and 5,000 new jobs respectively).⁶ Today, about one in eight Toronto jobs (330,000 in total) are technology jobs.

³ Information and Communications Technology Council of Canada (ICTC), Digital Talent: Road to 2020 and Beyond, 2018. Available at: https://www.ictc-ctic.ca/wp-content/uploads/2016/03/ICTC_DigitalTalent2020_ENGLISH_FINAL_March2016.pdf.

⁴ Brookfield Institute for E&I, The State of Canada's Tech Sector, 2016. Available at: <http://brookfieldinstitute.ca/wp-content/uploads/2016/07/The-State-of-Canadas-Tech-Sector-2016-V2.pdf>.

⁵ Ibid.

⁶ CBRE, Scoring Tech Talent in North America, 2017. Available at: <https://www.cbre.com/report-download?PUBID=84380a2c-bb09-4cb5-9c61-c810544803cb>.

The need for reform: Ontario needs an impactful talent strategy

Despite the huge potential for Ontario's technology sector, it is also facing significant challenges. First is the impact of continuing and growing workers shortages. By 2021, it is estimated that 216,000 technology jobs will go unfilled across Canada⁷. By that date, technology employment in Ontario is expected to reach 670,000 jobs with nearly one in six jobs unfilled. The result is both an immediate GDP hit of over \$10B annually but also a long term impact as technology firms that are unable to grow sufficiently fast, often die out.⁸

Second, the sector continues to witness new disruptive technologies. The past five years alone have seen the emergence of Artificial Intelligence (AI), Block Chains, IOT, Augmented and Virtual Reality, and 3D printing. Such technologies are both an opportunity to grow new sectors but also a threat to existing sectors. Ontario's ability to ensure that these technologies are leveraged effectively and efficiently means that a strategy is required for training existing technology workers in a more dynamic manner.

Third, the technology space is struggling to become more inclusive and diverse. For example, only 16.5% of employees at Canada's largest ICT firms are women and just 5% of CEO's are women. Little Canadian data is available on employment of minorities into technology jobs but US studies showcase significant shortfalls in both cases with the situation exacerbated in more senior positions. And yet, minorities are significantly over-represented in job applicants to Toronto's technology firms.⁹ Engaging significantly under-represented groups is both a social imperative but also, with such significant talent shortages, an economic necessity.

⁷ ICTC, The Next Talent Wave: Navigating the Digital Shift, 2017. Available at: https://www.ictc-ctic.ca/wp-content/uploads/2017/04/ICTC_Outlook-2021.pdf.

⁸ Ibid.

⁹ MaRS, Talent Fuels Tech, 2018. Available at: <https://talentdevelopment.marsdd.com/resource/talent-fuels-tech/>.

Last but not least, employment in many traditional sectors (retail, banking, trucking, etc.) is being significantly impacted by new technologies with the pace expected to increase. The result is ominous levels of job displacements in some sectors even while others sectors have major employment shortages. New paradigms are needed to help transition mid-career workers from shrinking to growing sectors, a strategy that is particularly difficult when non-technical sales in the emerging knowledge economy are needed.

How to move forward

The Ontario government has made some initial steps to address talent shortages. These include:

- Increasing the number of STEM graduates in Ontario by 10,000 annually
- Graduating an additional 1,000 Masters students in applied AI annually
- The Ontario Provincial Nominee Program has grown from 4,500 to nearly 7,000
- Creating 40,000 experiential learning opportunities over three years

These steps, while welcome, are far from sufficient to meet the needs of the technology sector. STEM graduates work in a large cross-section of industries and only a minority of the additional graduates will seek direct technology sector employment. Expansion of graduates from disciplines well aligned with technology should take place as quickly as possible. As part of the Strategic Mandate Agreements, universities and colleges should be funded to expand these disciplines.

The expansion of masters degrees in applied AI helps Ontario respond to this burgeoning field. A permanent mechanism is needed to support similar expansions as emerging technological areas come to the fore. Government should create a competitive process whereby post-secondary institutions apply for limited-term funding to develop novel training in emerging technologies. By keeping funds to limited-term, institutions would be incented to rapidly deploy new programs but also to curtail such programs when demand declines. By keeping such funding to limited time, the efficacy of funding can be measured before new funding is approved.

Recognizing the pervasive nature of technology and its impact across all economic sectors, embedding additional technology training across disciplines is necessary. This would allow, for example, students coming out of social sciences and humanities to take on non-development jobs in the technology sector while also ensuring they are capable of identifying, and addressing, technology needs across society.

A new mechanism is needed to transition workers displaced by technology into technology firms. Such a strategy is premised on identifying underlying skills in individual displaced workers that align best with the needs of technology firms. A rapid, nimble, demand-driven training system can then be created that transitions these workers to technology jobs. As just one example, to address the well documented shortage of technical sales personnel, a training program for displaced mid-career sales workers in retail may well help fill the gap.

The province must immediately address the severe under-representation of women and minorities in the technology space. As a first step, statistics should be collected to better understand the extent of the problem. A two-prong approach might be needed. First, programs with a higher percentage of these groups should be incented to increase their technology training. Second, new training paradigms for displaced workers may also be effective for these groups.

Experiential learning has proved a highly effective mechanism for transitioning into jobs. As such experiential learning opportunities should be significantly broadened to also specifically target mid-career individuals, and under-represented groups.

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