



Information and Communications Technology Council Conseil des technologies de l'information et des communications

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Pre-Budget Submission 2017:

BUILDING A RESOURCEFUL NATION - THE TALENT IMPERATIVE

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Council**

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Executive Summary:

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Digital transformation continues to radically change the face of business in Canada. Spurred by strong business-to-business and business-to-consumer appetite, digital disruption is being felt in the banking, media, transportation, manufacturing, health, retail, and many other sectors. This reshaping of traditional markets is also challenging every aspect of incumbent firms in an increasingly global and competitive landscape. This is evidenced by the advent of the sharing economy and other unfettered innovations that are increasingly being empowered by everyday entrepreneurs. The accelerated wave of business transformation, however, comes against a backdrop of a sluggish global economy, soft commodity prices, and a weaker Canadian dollar. The recipe for success is equipping Canadians with the relevant technology skills to innovate, adopt technologies, and produce higher-value goods and services. This will empower a more dynamic economy based on our ability as a nation to intensify investments in infrastructure and R&D, diversify our industries, and expand trade.

Base on the Information and Communications Technology Council's (ICTC) national digital talent strategy released in March 2016 in partnership with Microsoft Canada, ICTC recommends addressing our current and future skills needs for the digital economy. Specifically, to focus on:

- ▶ Growing tomorrow's innovators
- ▶ Supporting work force upskilling to enhance digital adoption
- ▶ Leveraging our diverse talent
- ▶ Attracting top international talent

Children entering schools today will face a new era of breakthrough technologies shaped by robotic manufacturing and artificial intelligence; mobile purchasing with automated warehouse and drone delivery; self-driving vehicles, as well as many others. The workplace of the future will have few opportunities for low-skilled workers.

Canada's Innovation Agenda and our success in the Fourth Industrial Revolution will be dependent on building the nation's digital skills. Countries with an established supply of high skilled talent will reshape the competitiveness of their industries, the quality of jobs available, and decision to locate, invest or move business to or from Canada. On the same token, building the foundational digital skills for citizens and consumers skills are also vital for leveraging the full extent of the digital economy. Canadians with foundational digital skills will be more at ease for instance when accessing government services online, seek new jobs and social opportunities, do business online, and protect themselves in the process. Likewise, in a fast-paced electronic world, firms that lack the skills to implement their visions will be left behind by global competitors. Ideas and intellectual property that drive the digital economy and innovation systems will be dependent on the creativity and skills of the talent available.

The Talent Gap

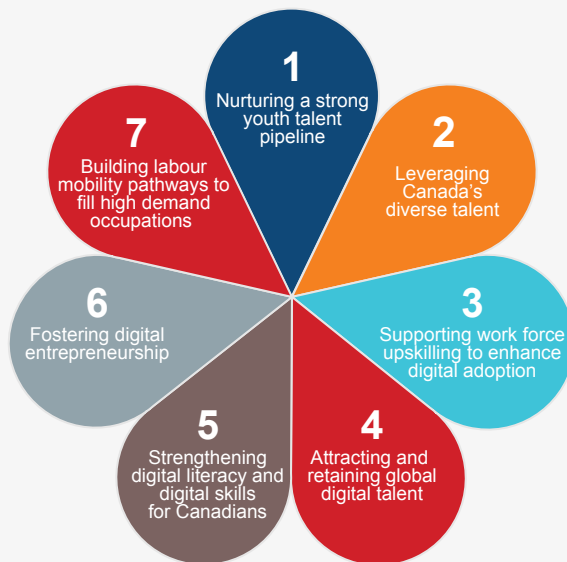
Research conducted by ICTC determined that one in three Canadian employers have challenges finding workers with the right skills¹. Technology workers in Canada are in high demand with the number of graduates not keeping pace with the market demands². With Canadian graduates being recruited by technology firms from around the world, Canada's skills-gap in the technology sector continues to widen.

Canada suffers from a desperate and growing shortage of computer developers and software engineers. Over the past several decades, Silicon Valley has claimed our best and brightest.”

- Ryan Holmes, CEO HootSuite (Financial Post)

¹ ICTC, Labour Market Outlook 2015-2019

² ICTC, Digital Economy Supply – Canada's post-Secondary Education Stream, page 5



ICTC's Digital Talent Strategy:

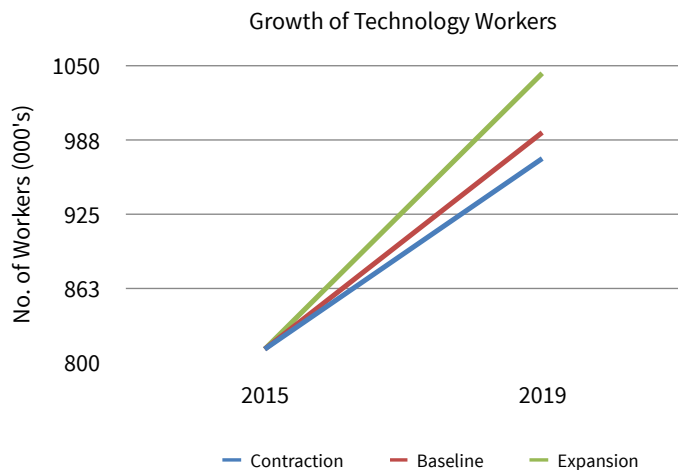
Road to 2020 and Beyond

Canada can grow its economy, generate greater opportunity through technology to provide higher incomes and greater prosperity through investing in its people. In ICTC's National Digital Talent Strategy, developed in partnership with Microsoft Canada, ICTC recommended seven key themes on developing a digital workforce:

ICTC's five-year projection forecasts shortages in many technology jobs including mobile app developers, network systems analysts, data analysts, cyber security experts, digital media, and computer programmers. This will hamper our competitiveness in technology adoption, e-commerce, cloud computing adoption, security, economic development, use of big data, robotics and automation, intelligent retain, smart cities, connected transportation, financial technology, biotechnology, and clean tech.

Talent Investments Benefit all Canadians

Connected devices are moving beyond today's phones to include homes, cities, vehicles and more. This will drive future economic opportunity and social advancement. ICTC's research has shown that adoption of mobile services that increases labour productivity by 1% can yield a \$2.5 billion return to our economy. A 20% increase over 2015 investments in technology adoption would increase our GDP by 1% or \$15.5 billion³.



³ ICTC, National Digital Talent Strategy 2016, page 33

Government and business investments would provide significant returns. As would Canadians – technology workers have lower unemployment (average 3% vs national 7%) and have salaries 48% higher on average than jobs in other sectors of the economy⁴. The growth of digital jobs has outpaced the overall economy in the last two years by over 4:1⁵.

However, economic benefits require employees, consultants and contractors who can implement and manage the new technologies, an important factor in driving business growth and competitiveness.

ICTC bases its recommendations on Canada's projected talent needs for the overall economy and their contribution in empowering competitive industries and a digitally vibrant society. These recommendations are guided by reliable and timely labour market forecasts, an essential component for informing and shaping good policies and programs.

1

Growing tomorrow's innovators

Canadian youth are dropping out of science and math in high school, eliminating many from tomorrow's job opportunities without remedial work. In many Provinces there is insufficient technology and computer education. While Provinces are moving in the right direction, a great deal more needs to be done for youth coming out of high school today.

Recommendation 1

- ▶ Building competencies in K-12 for prototyping, creative ideation, and business thinking within and outside school setting. A \$10 million investment for nurturing a strong K-12 for over 1,500 students with K-12 ICT/STEM-integrated curriculum would yield an annual GDP contribution of \$184 M when the majority of these students progress in ICT/STEM education and engage in related full-time employment⁶.
- ▶ Support efforts by provincial governments to incorporate computer science into the K-12 curriculum by developing, in consultation with the provinces and industry, a standard national curriculum with lesson plan materials.
- ▶ Better align industry and educational programs in colleges and universities to meet the skills needs of tomorrow's job market.
- ▶ Increase the opportunity for young STEM graduates to get on-the-job training while easing the financial burden for Micro and SMEs to hire needed talent. This can be achieved by scaling up existing federal wage subsidy programs to reach a greater number of Micro & SMEs.

⁴ Innovation, Science and Economic Development Canada (October 2014), Canadian ICT Sector Profile

⁵ ICTC, National Digital Talent Strategy 2016, page

CyberTITAN: Training Tomorrow's Cyber Security Experts

In June 2016, ICTC launched Canada's first national cyber security defence competition for high school students. The program involves a high school coach and an cyber security mentor working with the high school team to develop cyber security skills that will be tested in competitions. ICTC is working with Sisler High School leaders in Winnipeg to spread their program across Canada to develop cyber-literate youth. Teams from across Canada will compete against one-another for a chance to travel to the international competition hosted by CyberPatriot in the US. Students will come away with hands-on learning in computer science and cyber security skills, and be well placed for postsecondary education.

2

Supporting work force upskilling to enhance digital adoption

The enhanced connectivity between billions of devices made possible by the Internet of Things (IoT) is driving the transformation of the digital economy into an intelligence economy shaped by big data and analytics. By 2020, there will be more than 50 billion devices connected online worldwide, significantly reshaping manufacturing, banking, retail, health and many other sectors. As this rapid environment shapes up, the demand has intensified for a skilled workforce that offers a fusion of technology, business, computational thinking, entrepreneurial, creative and interpersonal skills. Building a workforce with these skills requires extremely strong and up-to-date educational programs that offer a blended curriculum. At the same time, programs need to integrate a component of interpersonal skills that graduates will require to build client relationships, understand organizational needs and package technical information in a way that can be communicated to a non-technical audience. This is a growing phenomenon across all sectors of the economy, where traditional jobs are morphing into new roles influenced by technology.

Recommendation 2

- ▶ Provide wage subsidies or tax credit for employers to provide job up-skilling and retraining to acquire more technical skills to reduce layoffs as companies adopt more technology. Provide funding or tax credit for Micro and SMEs to provide job up-skilling and retraining in emerging technology fields. A 1% in labour productivity improvement resulting from leveraging advanced SMAAC technologies would yield \$8 billion to the Canadian economy”
- ▶ Developing supports to facilitate the transition of displaced workers into ICT careers by continuing their Employment Insurance benefits for a period that enables training to occur at noneeds of tomorrow's job market.

3

Leveraging our Diverse Talent

ICTC's research into immigration points out that diversity that strengthens innovation⁷. McKinsey & Company's research paper "Diversity Matters" (2014) concluded that companies with greater ethnic and gender diversity generally had higher valuations⁸. This bodes well for Canada's tech scene that reflects the country's cultural mosaic: The number of women in technology is increasing, the number of immigrants and new Canadians is high (40%) and the number of temporary foreign workers is low (4%)⁹. However, Canada's technology sector requires a high level of education and soft skills like language and business culture to be successful. To optimize Canada's workforce and provide greater opportunities to Canada's workers, ICTC recommends scaling-up successful programs and continuing to support programs that promote skill development in under-represented groups.

Recommendation 3

- ▶ Scaling-up strong education programs for Indigenous youth and other under-represented groups
- ▶ Expanding Status of Women funding on programs that promote opportunities and remove career-advancing obstacles for women

Increasing Opportunities for Women in Non-ICT Sectors

ICTC is empowering Canadian companies to meet current and future technical needs by retaining and advancing top talent. The Advancing Tech Women (ATW) initiative, funded by Status of Women Canada, helps reduce barriers and advance more women in sectors like construction, manufacturing and natural resources where women make up a small portion of the current workforce.

6 ICTC, Immigration Supply Study (2016) – to be released Fall 2016, page 18

7 McKinsey&Company, Diversity Matters (2014)

8 ICTC, Immigration Supply Study (2016)

4

Attracting Top International Talent

Canada faces a number of challenges attracting talent: Even with significant demand for technology workers in Canada and around the globe, employers must navigate a variety of federal and provincial barriers to bring in new workers. Government's should endeavour to remove barriers to firms seeking high skill, in-demand workers that can advance our economy, while maintaining appropriate checks and balances against companies seeking to hire lower-wage workers over qualified Canadians.

Recommendation 4

- ▶ Providing a temporary exemption from the Labour Market Impact Assessments or related requirements for two years (for instance) for specific high-demand occupations identified by labour market forecasts. This should be capped to a certain number of nationally (or per organization based on size)
 - ▶ Make allowance to hire above the cap limit in return for contributing financial support to developing the talent supply in Canada (quid-pro-quo policy)
- ▶ Increasing pre-and-post arrival training and support as these connections and training programs improve the experience and productivity of newcomers in Canada

ICTC's GO Talent Program

GO Talent brings together employers with Internationally Educated Professionals who are within months of arriving in Canada. The initiative helps employers build and maintain an inclusive and diverse workforce which can lead to enhanced innovation and competitiveness in the global economy. Newcomers are prepared and matched to job opportunities in Canada based on their skills. In the last year, ICTC's GO Talent has offered services to over 1,000 newcomers to Canada.