DIGITAL ECONOMY ANNUAL REVIEW

LABOUR MARKET • DIGITAL ECONOMY • TALENT • ICT

THE INFORMATION AND COMMUNICATIONS TECHNOLOGY COUNCIL (ICTC)

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EXECUTIVE SUMMARY

The Information and Communications Technology Council (ICTC) is pleased to present the *Digital Economy Annual Review 2014*, exploring broad trends of the past year in Canada's digital economy with respect to economic impact, labour market, technology adoption, and more. Skilled Canadians are the foundation of economic growth in today's globalized, innovative digital economy. The emergence of new technologies such as cloud services, digital platforms, and mobile technologies has challenged Canadians, their employers, educators, and policymakers to adapt to the new paradigm. While much work remains, all stakeholder groups have taken notable strides in the past year – as demonstrated by this report – to meet that challenge.

This report is beneficially read in the context of ICTC's related recent research exploring emerging technologies, and the adoption of digital technology by Canadian enterprises of all sizes. ICTC provides labour market information at the sub-provincial level to assist policymakers, educators, enterprises, and Canadians make an optimal contribution to the digital economy with appropriate policies and training to ensure Canadians have the skills they need, and enterprises the human capital they require.

Recent ICTC studies and papers addressing these issues and available on our web site include:

- *The Appification of Everything: Canada's Apps Economy Value Chain* (Study – March 2014)
- *Canada's Mobile Imperative: Leveraging Mobile Technologies To Drive Growth* (Study – June 2013)
- *Canada's Digital Imperative: Measuring Digital Platforms' Labour Market and Economic Impact* (Study – September 2013)

CONTRIBUTION TO GDP CONTINUES TO RISE

Real gross domestic product (GDP) produced by the Canadian ICT sector in 2013 increased to $69.3 billion, over $1 billion higher compared to 2012. This increasing trend is set to continue, as initial data shows that ICT sector's contribution to Canadian GDP has grown further in early 2014.

STRONG SHOWING IN THE LABOUR MARKET

788,000 ICT professionals were employed in Canada in 2013, increasing significantly (⬆32,000) compared to 2012. As more jobs continued to be created since 2011, more people joined or returned to the labour force. As a result, the jobless rate did not decrease despite increased employment levels, and remained steady at 2.9% for the third consecutive year.

All sectors of the Canadian economy employ ICTs to boost productivity and efficiency. In 2013, the Canadian labour market experienced sizable growth: 224,000 jobs (⬆1.3%) were created across all sectors. ICT employment grew by 4.1% (⬆). One in seven, 14% of all jobs created in 2013, was in the ICT professions.

Among employed ICT professionals, 45% are employed in Canada's ICT sector; 55% are in all other sectors (e.g. service, finance, health). This is a leading indicator that ICT will continue to play a leading role in the growth of the overall Canadian labour market and economy. It also reinforces the reality that all Canadians need to have the technical skills, understanding, and opportunities necessary to effectively use ICTs and succeed in an interconnected global economy.

ICT SKILLS ARE WELL COMPENSATED

The national average salary in ICT jobs currently is $72,000, an increase from $53,000 in 2000, $59,000 in 2005, and $67,000 in 2010. The current national average salary in ICT jobs is 33% higher than the average salary in all jobs combined. In addition, women in ICT positions receive a much more equitable compensation compared to the overall workforce, evidence of a strong demand for ICT talent throughout the economy. On average, women earn 91% of the salary of their male counterparts in ICT jobs. This is an improvement from 80% in 2000, 82% in 2005, and 88% in 2010. In the overall Canadian workforce (ICT and all other), women currently earn 81% of male earnings.

IMPROVED WORKFORCE DIVERSITY CRITICAL TO CANADA'S FUTURE

The digital economy continues to be an economic driver and influence on society. It has been well established that the consequences of not improving workplace diversity – particularly gender diversity – in Canada's digital economy can be dire. A lack of diversity means a limited talent pool, fewer ideas and perspectives, among other things.

It is promising to see an improving trend with respect to gender diversity in the digital economy. Following a marginal dip in 2012, the employment of women in ICT jobs has grown considerably in 2013. An additional 21,000 women joined the ICT workforce, recording a 12% annual growth. Overall, 201,000 women were employed in ICT occupations in 2013. In contrast, 587,000 men were employed in ICT professions in 2013, an annual growth of 2%.

WORKFORCE TRANSITION REQUIRES CAREFUL PLANNING

The number of youth – defined as those aged 25 or younger – employed in ICT occupations grew substantially in 2013. Youth employment increased by 8,000 this year, an increase of 21%. Overall, 47,000 (or 6%) of all ICT jobs were occupied by youth in 2013, as youth employment returned to the pre-recession (2007) level for the first time. The jobless rate among those aged 25 or younger in Canada was 13.7% in 2013. At 5.5%, joblessness in ICT occupations among this age group was notably lower, as has historically been the case for the last 15 years.

Another key group in the demand-supply dynamics of the ICT workforce is those aged 55 or older. The number of employed ICT professionals in this demographic group doubled in the last ten years, with clear challenges for knowledge retention in the Canada's digital economy in the coming years as the baby boomer generation retires.

HOMEGROWN TALENT NOT ENOUGH

Of the total employed workers in ICT occupations in 2013, 294,000 (37%) were immigrants. This is a 7% average annual growth for the previous two years, as ICT employment among immigrants increased by 35,000 since 2011. Jobs that have a strong emphasis on technical skills – for instance software programming or web development – are easier for new and arriving Canadians to find as these skills are easily transferable and highly in demand. The proportion of immigrants has been consistent in recent years at or above a third of the ICT workforce. This is in sharp contrast with the overall economy, where a quarter of all jobs are held by immigrants. This is evidence of a strong demand for ICT talent and skills throughout the economy. The jobless rate among immigrants in Canada is 7.8% at present. In ICT occupations, joblessness among immigrants is consistently lower and has remained just above 3% for the past three years.

ABORIGINAL PEOPLES, AN UNTAPPED RESERVOIR OF TALENT AND SKILLS

Despite continuing low joblessness in Canada's digital economy, the supply of skilled professionals to fuel this vibrant economy is limited. Creating a skilled workforce that takes advantage of a diverse talent pool and that is inclusive of Aboriginal peoples is critical not only for this community, but also for Canada's digital economy. Of the total employed professionals in ICT occupations in 2013, 10,300 were Aboriginal persons. This is a 4% average annual growth for the previous two years, as ICT employment among Aboriginal peoples increased by 800 since 2011.

WHAT THE COMING YEAR HOLDS

Canada's digital economy has recovered well and emerged stronger from the uncertainties following the global financial crunch of 2008-2009. Canada is well positioned to fully leverage the digital economy as a catalyst for job creation, innovation, and growth. Competing in today's digital economy requires a company to utilize technology in order to boost productivity. A workforce that can effectively use the technology is essential for companies seeking to realize a productivity advantage. In addition to having higher-skilled ICT professionals in the roster, employers need to be proactive to up-skill non-ICT professionals to increase their understanding of the impact and potential of technology. Given the fact that today's mid-level professionals will have to

assume greater responsibilities rather quickly as the rather high proportion of experienced professionals retire, mid-level non-ICT professionals should be the focus of this up-skilling in particular.

Another critical factor for Canada's prosperity is enterprise adoption of enabling technologies. Consultation with ICT service providers during many of our recent research initiatives reveals that many of the SMEs need an injection of capital to grow their operations and are finding it challenging to access the required level. Finding solutions to enable small- and medium-sized enterprises (SMEs) to access the same level of capital as the large corporations is critical to make SMEs more competitive. The recent Digital Canada 150 announcement by the Government of Canada's helping SMEs to adopt digital technologies is a strong step in this direction. Empowering today's and tomorrow's workforce is vital for Canada's competitiveness in a global economy.

We hope you enjoy reading *Digital Economy Annual Review 2014!*

1.   OUTPUT AND OUTLOOK

ICT OUTPUT

Real gross domestic product (GDP) produced by the Canadian ICT sector in 2013 increased by over $1 billion compared to 2012, to $69.3 billion (figure 1).[1] This trend is set to continue as initial data shows that the ICT sector's contribution to Canadian GDP has grown further in early 2014.[2]

The ICT sector accounted for 4.4% of Canada's total output of $1,589 billion in 2013. The emergence and adoption of ICT products and services has created incremental economic opportunities for all economic sectors. ICTs are promising new frontiers for innovation and economic growth that will result in employment creation, efficiency gain, cost reduction, and revenue generation across all sectors. The overall impact of ICTs on the Canadian economy as a result is much greater.

Figure 1.   Canadian and ICT sector GDP (in billion dollars)
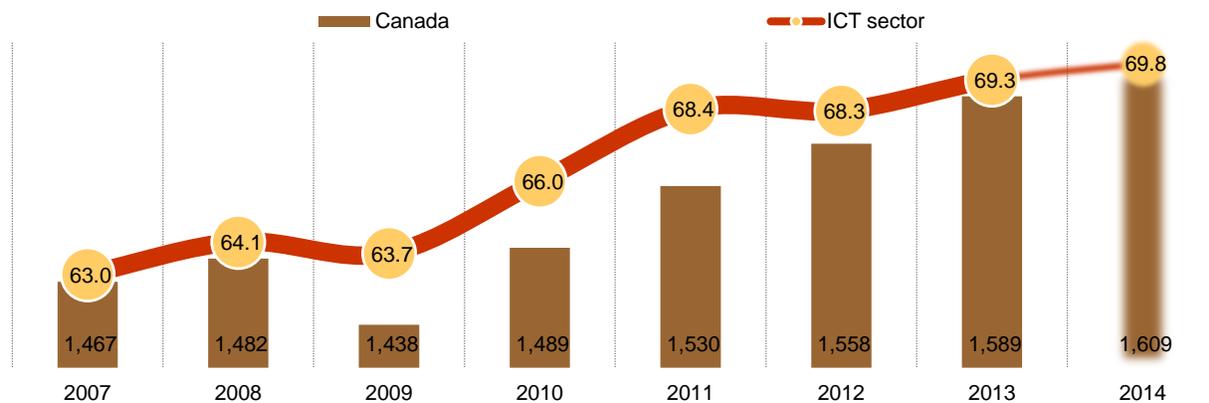
Source: ICTC; Statistics Canada

Following four consecutive years of outperforming the overall Canadian economy, growth in the ICT sector has been moderate in the past two years (figure 2). ICT sector output of $69.3 billion in 2013 was $1 billion higher than it was in 2012 – a year-over-year output growth of 1.5%, and a 5% increase compared to three years ago (2010) and 8.2% growth compared to five years ago (2008).

ICTs have a profound direct and enabling impact on the overall economy. These technologies enable workers and businesses to upgrade existing business strategies, workplaces, and operational procedures to improve productivity. Output growth in the ICT sector was a contributing factor to 2% year-over-year growth in the overall Canadian economy in 2013.

Despite a 3% increase in GDP in the ICT services industries in 2013, the overall ICT sector only grew by 1.5% in the past year due to uncertainties in the global economy stemming from a slowdown in China, as well as a large decline in GDP in the ICT manufacturing industries (⬇15%), due mainly to a strong Canadian dollar until the second half of 2013.

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[1]   In 2007 chained dollars. Chained dollars are real dollar amounts adjusted for inflation.
[2]   GDP figures for 2014 are calculated using January 2014 data.

On average, annual growth in the ICT sector has been 1.6% over the last five years since 2008, higher than that of the overall economy (1.4%). This was achieved through strong growth in ICT services industries that recorded 2.2% average annual growth in that period; ICT manufacturing industries experienced a 5.6% average annual decline. Canadian ICT manufacturers can expect a turnaround in business conditions, thanks to the weakening of the Canadian currency.

Figure 2. Annual growth of GDP — 2008 to 2013
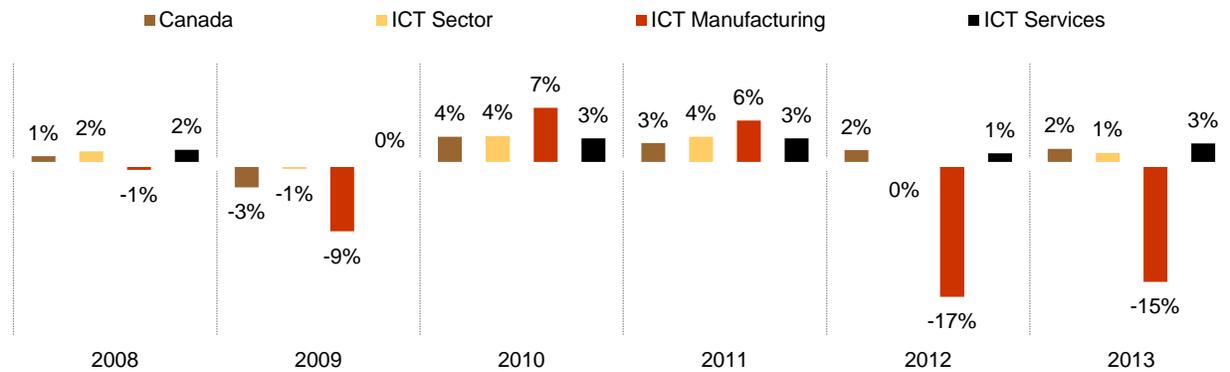
Source: ICTC; Statistics Canada

PROVINCIAL COMPARISON

Ontario is Canada's ICT leader. It contributed $31.5 billion to the total Canadian ICT output in 2013 (figure 3). In the same period, other notable ICT output contributors were Quebec ($14.2 billion), Alberta ($8.6 billion), British Columbia ($8.5 billion), Manitoba ($1.7 billion), Saskatchewan ($1.5 billion), and Nova Scotia ($1.4 billion).

Figure 3. ICT sector output by province (in billion dollars) — 2013
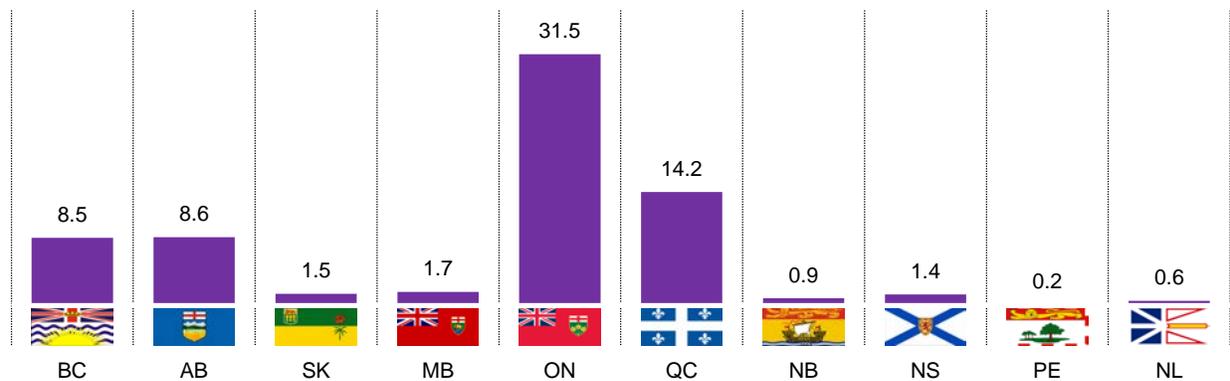
Source: ICTC; Statistics Canada

Advanced technological, research, and corporate infrastructure means that Canadian provinces offer unique opportunities and the provincial brands need to be built and promoted internationally around these. Each province has its unique attribute that gives it competitive advantage in an increasingly connected global market place, be it strong and robust industry verticals and clusters, pool of required skills, policy support, or an enabling business environment. It is vital to raise awareness of ICT options and benefits to encourage wider adoption and thus generate demand to increase output. It is also essential to recognize all available talent to improve understanding of the highly competitive global market and address the skills shortage.
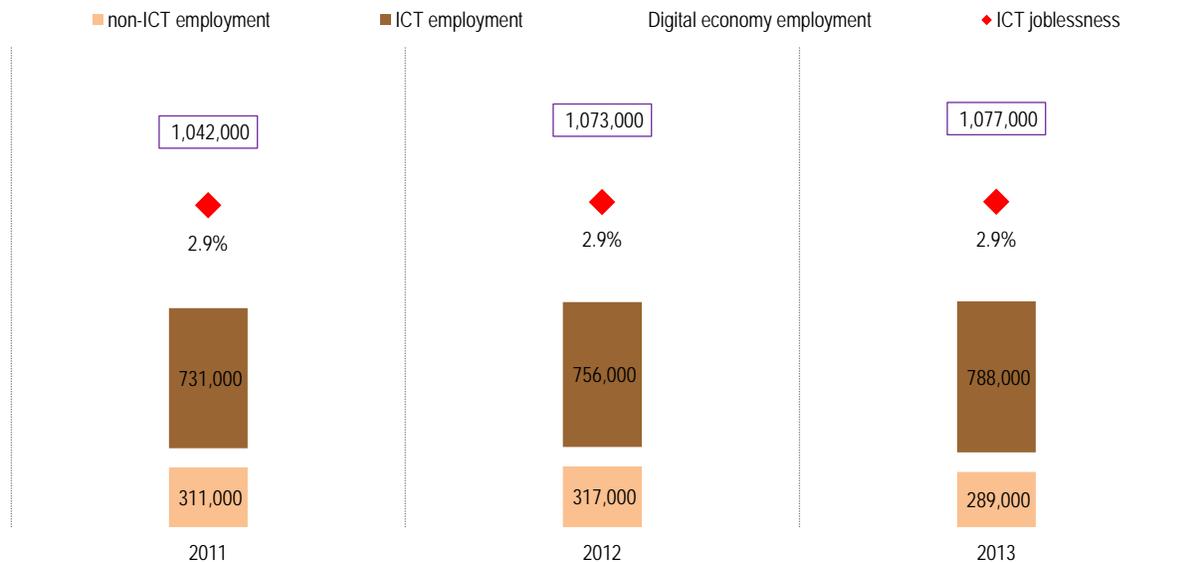
2.   LABOUR MARKET

CANADA

EMPLOYMENT LEVEL AND JOBLESSNESS

788,000 ICT professionals were employed in Canada in 2013, increasing significantly (⬆32,000) compared to 2012. As more jobs continued to be created since 2011, more people joined or returned to the labour force. As a result, the jobless rate did not decrease despite increased employment levels and remained steady at 2.9% for the third consecutive year (figure 4).

Non-ICT professionals employed in the ICT sector are key contributors to its growth and are included in our overall consideration of Canada's digital economy. Employment among these professionals decreased in 2013 to 289,000 (⬇28,000) from 317,000 in 2012.

The net effect of a sizable increase in ICT employment throughout the economy and decrease in non-ICT employment in the ICT sector was that employment in Canada's digital economy in 2013 increased compared to 2012 (⬆4,000), bringing the employment level in Canada's digital economy to 1,077,000.

Figure 4.   Employment in Canada's digital economy

Source: ICTC; Statistics Canada

All sectors of the Canadian economy employ ICTs to boost productivity and efficiency. In 2013, the Canadian labour market experienced considerable growth as 224,000 jobs (⬆1.3%) were created across all sectors. In contrast, ICT employment grew by 4.1% (⬆). One out of every seven jobs (14%) created in 2013 in Canada was in the ICT profession.

This is a leading indicator that ICT will continue to play a leading role in the growth of the overall Canadian labour market and economy. It also reinforces the reality that all Canadians need to have the technical skills, understanding, and opportunities necessary to effectively use ICTs and succeed in an interconnected global economy.

EMPLOYMENT BY SECTOR

Industries outside the ICT sector are major users of ICT products and services in Canada. The demand for top ICT talent continues to grow and has resulted in expanding career options for ICT professionals, placing competitive pressure on the employers seeking technical ICT talent. Among employed ICT professionals, 45% are currently employed in Canada's ICT sector, and 55% are in all other sectors (e.g. service, finance, health) (figure 5).

Figure 5.   Employment by broad industry classification
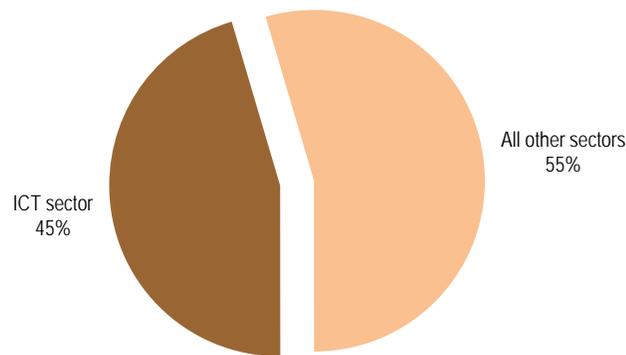
Source: ICTC; Statistics Canada

Companies in the professional and technical services industry are Canada's largest ICT employer. They employ 44% of all ICT professionals in Canada. By comparison, ICT employment is 11% in the information and cultural industry, 8% in the public sector, 8% in manufacturing, 7% in the finance industry, and 3% each in the trade and the education sectors (figure 6).

Figure 6.   Employment by industry
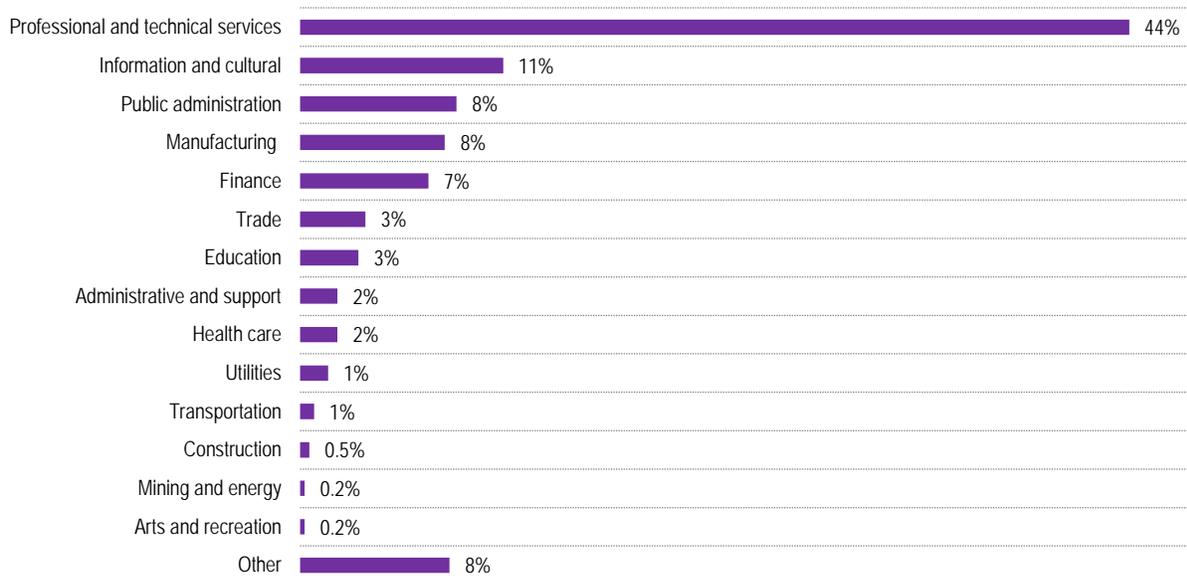
Source: ICTC; Statistics Canada

SALARIES

The national average salary in ICT jobs currently is $72,000, an increase from $53,000 in 2000, $59,000 in 2005, and $67,000 in 2010.

Figure 7.   Salaries in ICT jobs

Source: ICTC

The current national average salary in ICT jobs is 33% higher than that of the national average (table 1). Women in ICT positions receive a much more equitable compensation compared to the overall workforce, evidence of a strong demand for ICT talent throughout the economy. On average, women earn 91% of the salary of their male counterparts in ICT jobs, an improvement from 80% in 2000, 82% in 2005, and 88% in 2010. In the overall workforce, women presently earn 81% of male earnings.
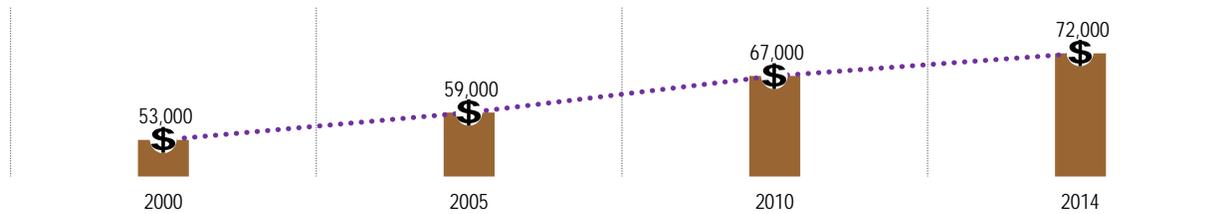
Table 1.   Average salaries in ICT jobs — Canada

| Occupation Title	Current gross annual salary (national average $)
computer and information system managers	99,000
telecommunication carrier managers	91,000
electrical and electronics engineers	88,000
computer engineers	83,000
information systems analysts and consultants	72,000
database analysts and data administrators	68,000
software engineers	82,000
computer programmers and interactive media developers	63,000
web designers and developers	43,000
electrical and electronics engineering technologists and technicians	59,000
computer network technicians	57,000
user support technicians	49,000
systems testing technicians	51,000
broadcast technicians	54,000
graphic designers and illustrators	41,000

Source: ICTC

WOMEN IN ICT

The digital economy continues to be an economic driver and influence on society. It has been well established that the consequences of not improving workplace diversity – particularly gender diversity – in Canada's digital economy can be dire. A lack of diversity means limited talent pool, fewer ideas, and perspectives, among other things.

In that regard, it is promising to see an improving trend with respect to gender diversity in the digital economy. Following a marginal dip in 2012, the employment of women in ICT jobs has grown considerably in 2013. An additional 21,000 women joined the ICT workforce, recording a 12% annual growth. Overall, 201,000 women were employed in ICT occupations in 2013 (figure 8). In contrast, 587,000 men were employed in ICT professions in 2013, an annual growth of 2%.

Figure 8.   Employment by gender
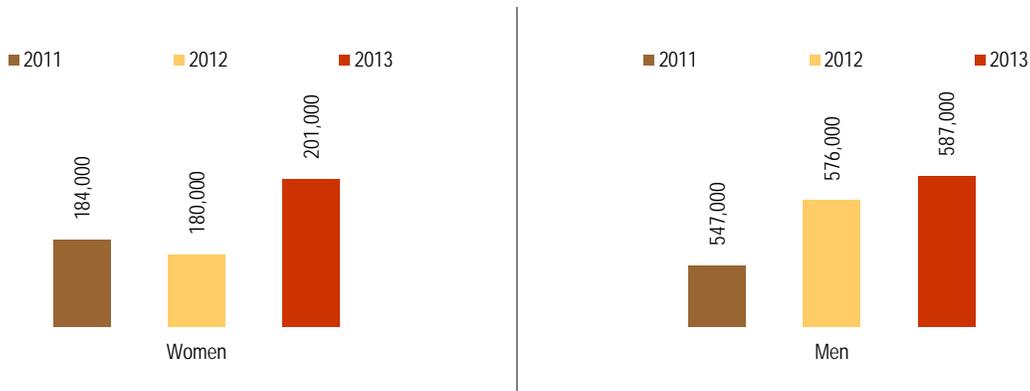
Source: ICTC; Statistics Canada

The highest number of women in ICT positions, 93,000, are employed in Ontario. By comparison, ICT employment for women was 47,000 in Quebec, 18,000 in Alberta, 25,000 in British Columbia, 5,000 in Manitoba, 4,000 in Nova Scotia and in Saskatchewan, 2,000 in New Brunswick and in Newfoundland & Labrador, and 1,000 in Prince Edward Island (figure 9). While some provinces are doing a better job than others of improving gender diversity in the digital economy, much work remains.

Figure 9.   Employment of women by province
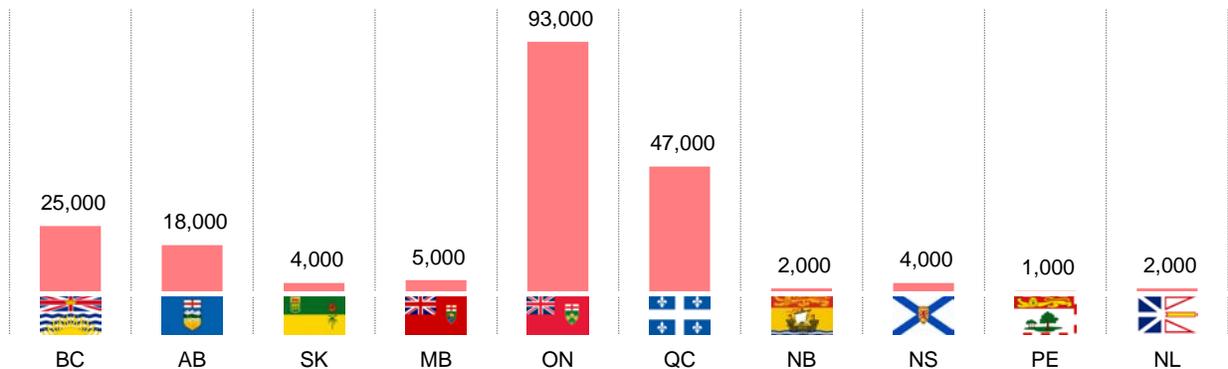
Source: ICTC; Statistics Canada

YOUTH IN ICT

Following two consecutive years of decline in youth employment – defined as those aged 25 or younger – in ICT jobs, the number of youth employed in ICT occupations grew substantially in 2013. Youth employment increased by 8,000, 21%, this year. Overall, 47,000 (6%) of all ICT jobs were occupied by youth in 2013, as youth employment returned to the pre-recession (2007) level for the first time (figure 10).

The jobless rate among those aged 25 or younger in Canada was 13.7% in 2013. At 5.5%, joblessness in ICT occupations among this age group was notably lower, as has historically been the case for the last 15 years.

Figure 10. Employment of young (15-24 years) professionals
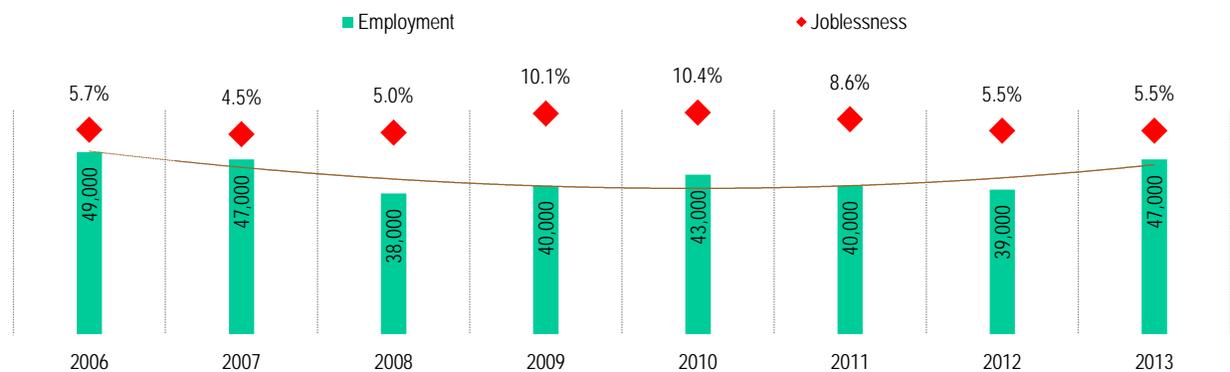
Source: ICTC; Statistics Canada

Another key group in the demand-supply dynamics of the ICT workforce is those aged 55 or older. The number of employed ICT professionals in this demographic group doubled in the last ten years, with clear challenges for knowledge retention in the Canada's digital economy in the coming years as the baby boomer generation retires.

ICT employment among those aged 55 or older increased by 29,000, 12%, average annual growth, in the last 12 years. Overall, 78,000 (or 10%) of all ICT jobs in 2013 were occupied by professionals that are nearing retirement (figure 11).

Figure 11. Employment of experienced (55-64 years) professionals
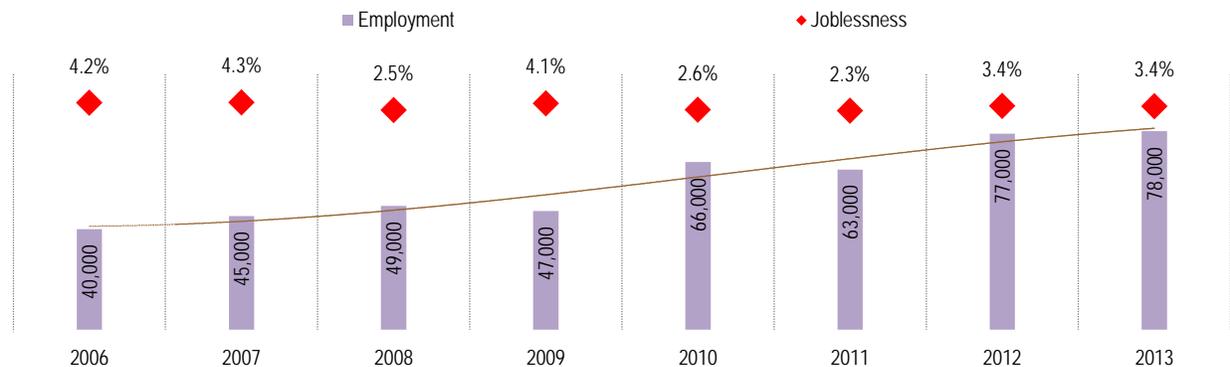
Source: ICTC; Statistics Canada

IMMIGRANTS IN ICT

Of the total employed workers in ICT occupations in 2013, 294,000 (37%) were immigrants. This is a 7% average annual growth for the previous two years as ICT employment among immigrants increased by 35,000 since 2011 (figure 12). Jobs that have a strong emphasis on technical skills – for instance software programming or web development – are easier for new and arriving Canadians to find, as these skills are easily transferable and highly in demand. The proportion of immigrants has been consistent in recent years at or above a third of the ICT workforce. This is in sharp contrast with the overall economy, where a quarter of all jobs are held by immigrants. This is evidence of a strong demand for ICT talent and skills throughout the economy.

Figure 12.   Immigrant employment

Source: ICTC; Statistics Canada

The jobless rate among immigrants in Canada is 7.8% at present. In ICT occupations, joblessness among immigrants is consistently lower and has remained just above 3% for the past three years (figure 12).

Figure 13.   Immigrant employment in ICT by province
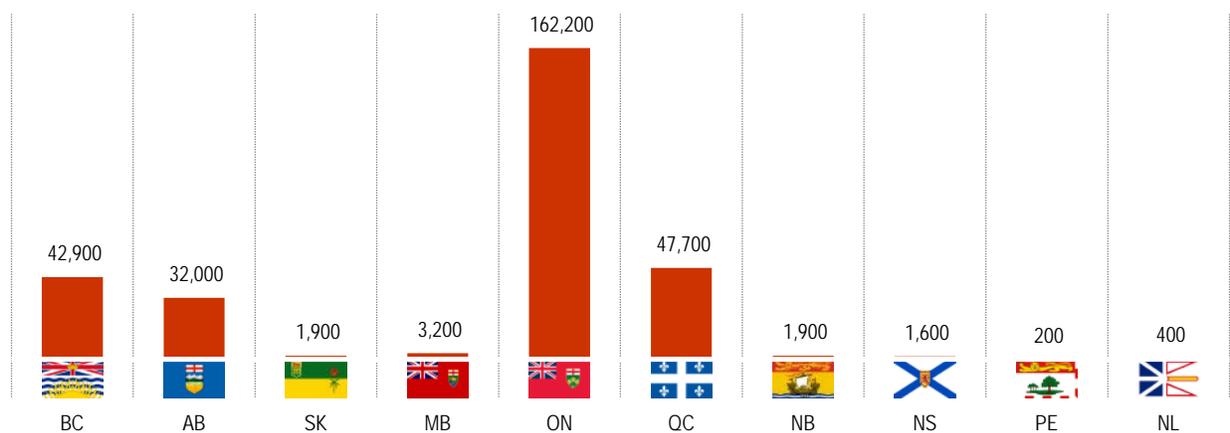
Source: ICTC; Statistics Canada

In ICT jobs, the highest number of immigrants in 2013 was employed in Ontario at 162,000. By comparison, ICT employment for immigrants was 47,000 in Quebec, 42,000 in British Columbia, 32,000 in Alberta, 3,200 in Manitoba, 1,900 in New Brunswick and in Saskatchewan, 1,600 in Nova Scotia, 400 in Newfoundland & Labrador, and 200 in Prince Edward Island (figure 13).

Aboriginal peoples in ICT

Despite joblessness in Canada's digital economy remaining low, the supply of skilled professionals to fuel this vibrant economy remains limited. Creating a skilled workforce that takes advantage of a diverse talent pool and that is inclusive of Aboriginal peoples is critical not only for this community, but also for Canada's digital economy. Of the total employed professionals in ICT occupations in 2013, 10,300 were Aboriginal persons. This is a 4% average annual growth for the previous two years, as ICT employment among Aboriginal peoples increased by 800 since 2011 (figure 14).

Figure 14. Aboriginal employment in ICT
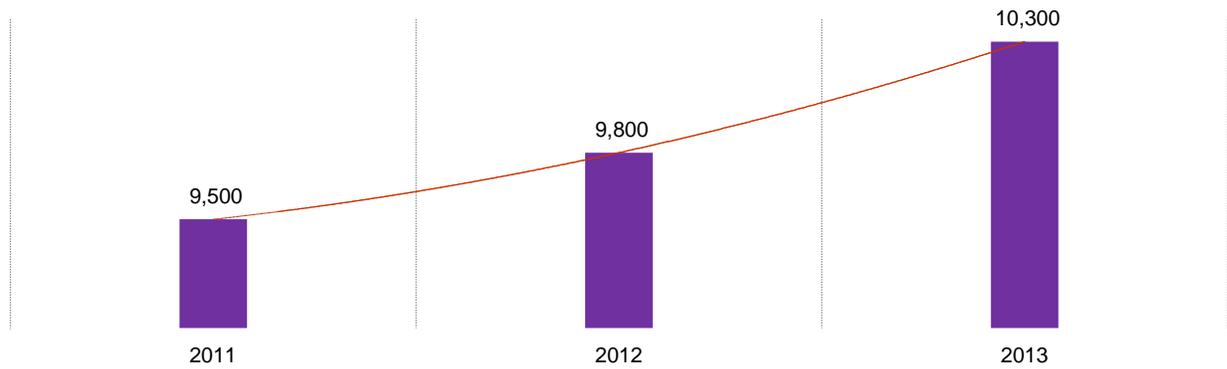
Source: ICTC; Statistics Canada

Aboriginal participation in Canada's digital economy can be facilitated by developing targeted talent, training, and education programs to strengthen skills. Labour market projections illustrate an ongoing need for ICT skills and talent in Canada for years to come; emphasis must be placed on guiding Aboriginal persons to consider careers in the digital economy.

BRITISH COLUMBIA

93,000 ICT professionals were employed in British Columbia in 2013. Of them, 56,000 worked in Vancouver, 8,000 worked in Victoria, and another 15,000 worked in the rest of the province. Since 2011, Vancouver further consolidated its position as the leading digital economy cluster in British Columbia, as ICT employment in Vancouver increased by 18% (⬆10,000) (figure 15).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

You can always discuss your additional city- and province-specific research and data requirements with ICTC researchers by clicking here.

Figure 15. ICT employment by cluster
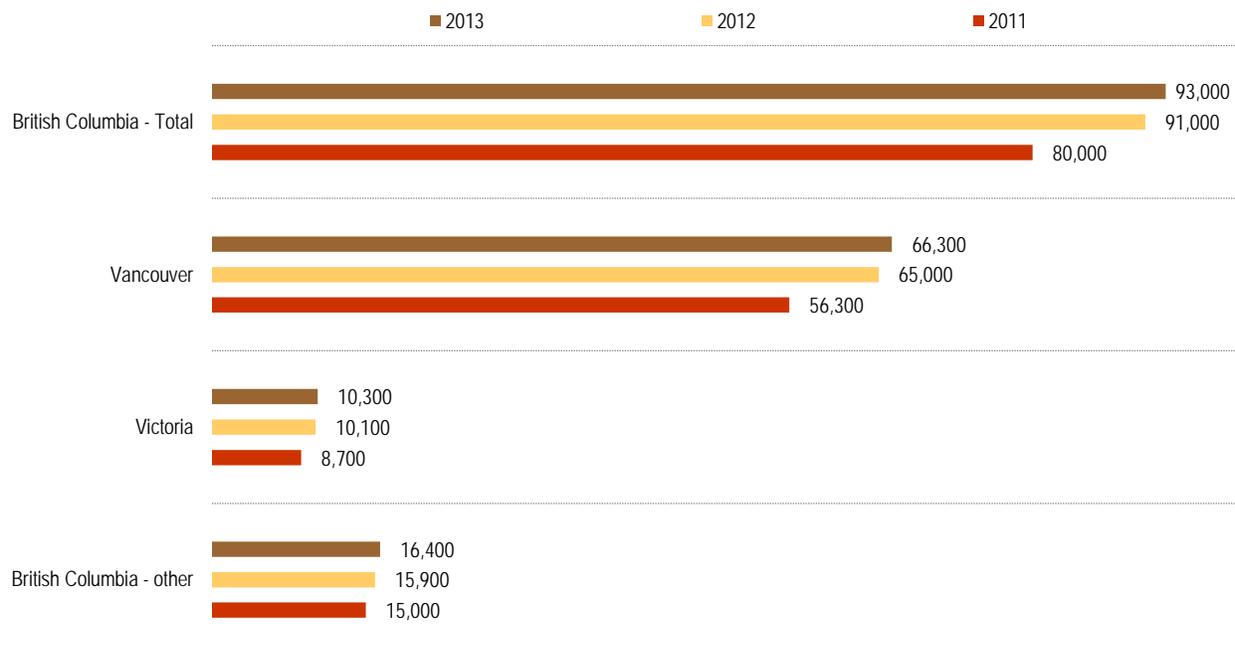
Source: ICTC; Statistics Canada

Demand for ICT skills is robust in British Columbia. At present, the most in-demand ICT jobs in the province are:

    (1)   multimedia designers / graphic illustrators

    (2)   data analytics / database architects/administrators

    (3)   technical support analysts/technicians

    (4)   software testers / systems technicians

    (5)   web developers

ICT professionals are well compensated in British Columbia (table 2).

Table 2.   Average salaries in ICT jobs — British Columbia

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	94,000
telecommunication carrier managers	91,000	88,000
electrical and electronics engineers	88,000	90,000
computer engineers	83,000	87,000
information systems analysts and consultants	72,000	71,000
database analysts and data administrators	68,000	68,000
software engineers	82,000	84,000
computer programmers and interactive media developers	63,000	65,000
web designers and developers	43,000	36,000
electrical and electronics engineering technologists and technicians	59,000	61,000
computer network technicians	57,000	59,000
user support technicians	49,000	52,000
systems testing technicians	51,000	52,000
broadcast technicians	54,000	49,000
graphic designers and illustrators	41,000	41,000

Source: ICTC

ALBERTA

75,000 ICT professionals were employed in Alberta in 2013. Of them, 44,000 worked in Calgary, 25,000 worked in Edmonton, and another 4,000 worked in the rest of the province. Since 2011, both Calgary and Edmonton further consolidated positions as leading digital economy clusters in Alberta, as ICT employment increased by 36% (⬆11,900) in Calgary and by 23% (⬆4,700) in Edmonton (figure 16).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

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Figure 16. ICT employment by cluster

■ 2013   ■ 2012   ■ 2011

Alberta - Total
- 75,000
- 65,000
- 61,000

Calgary
- 44,700
- 34,900
- 32,800

Edmonton
- 25,400
- 22,000
- 20,700

Alberta - other
- 4,900
- 8,100
- 7,500
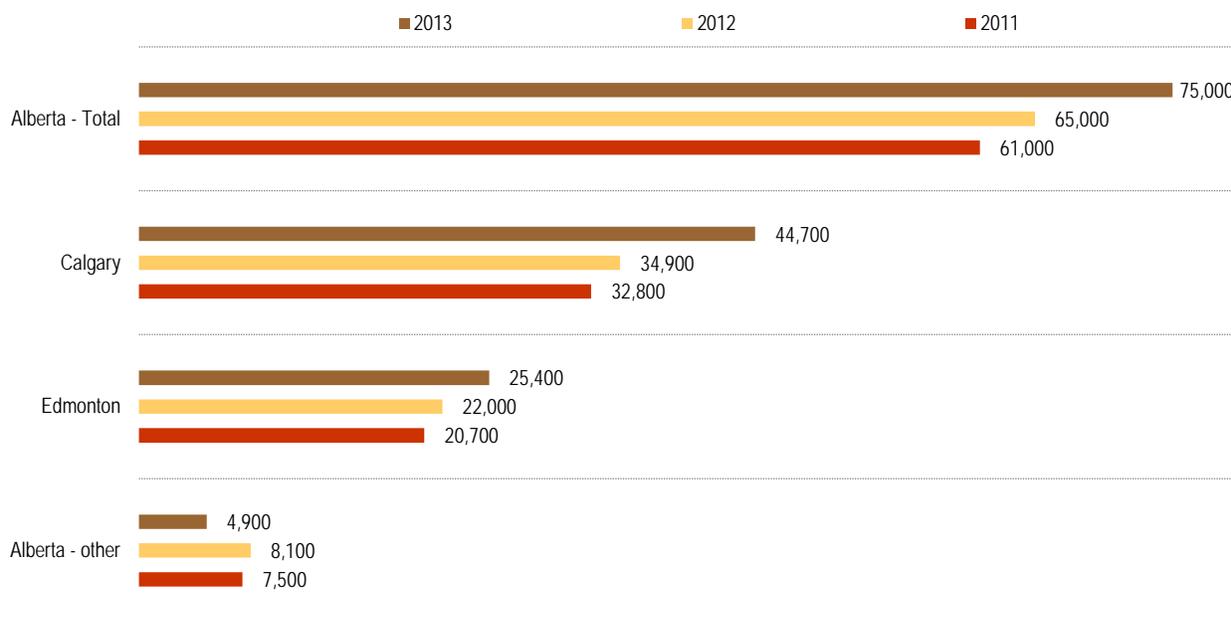
Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Alberta. At present, the most in-demand ICT jobs in the province are:

(1)   electronics/electrical engineers

(2)   software designers/engineers

(3)   telecommunications services/operations/facilities managers

(4)   electronics technologists/technicians

(5)   web / network support technicians/administrators

ICT professionals are well compensated in Alberta (table 3).

Table 3.   Average salaries in ICT jobs — Alberta

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	123,000
telecommunication carrier managers	91,000	98,000
electrical and electronics engineers	88,000	107,000
computer engineers	83,000	90,000
information systems analysts and consultants	72,000	83,000
database analysts and data administrators	68,000	78,000
software engineers	82,000	89,000
computer programmers and interactive media developers	63,000	73,000
web designers and developers	43,000	52,000
electrical and electronics engineering technologists and technicians	59,000	73,000
computer network technicians	57,000	69,000
user support technicians	49,000	61,000
systems testing technicians	51,000	62,000
broadcast technicians	54,000	58,000
graphic designers and illustrators	41,000	43,000

Source: ICTC

SASKATCHEWAN

11,000 ICT professionals were employed in Saskatchewan in 2013. Of them, 4,700 worked in Regina, 4,600 worked in Saskatoon, and another 1,700 worked in the rest of the province. Since 2011, many jobs were created in Saskatoon, as the city caught up to Regina as one of the leading digital economy clusters in Saskatchewan. ICT employment in Saskatoon increased by 28% (⬆1,000) in this period (figure 17).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

You can always discuss your additional city- and province-specific research and data requirements with ICTC researchers by clicking here.

Figure 17. ICT employment by cluster
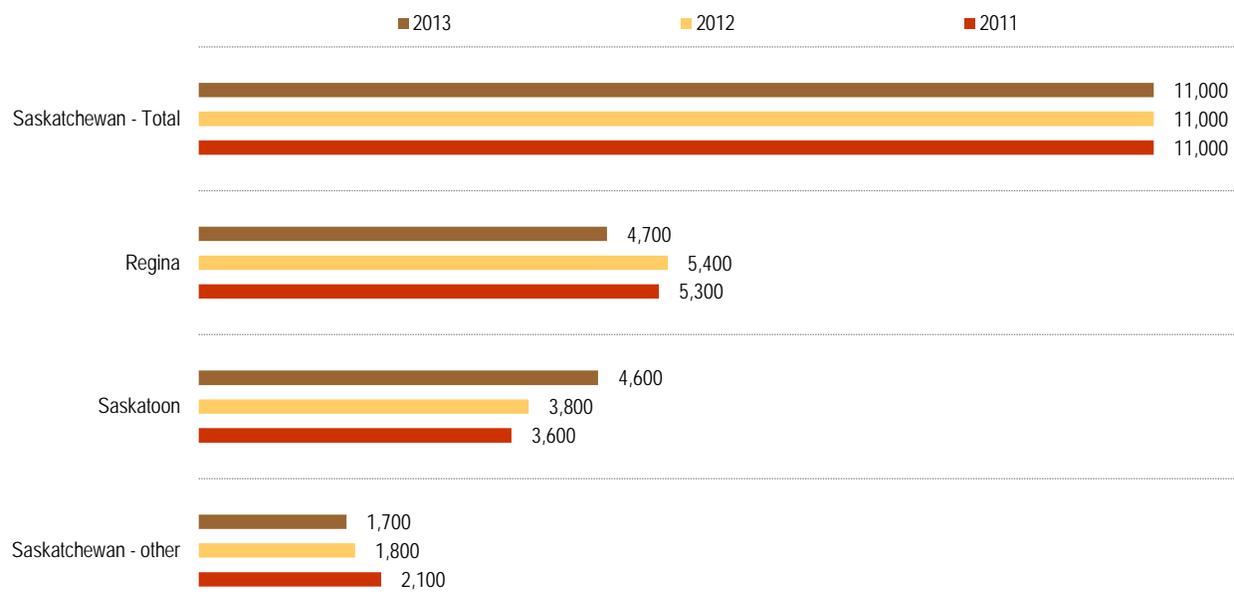
Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Saskatchewan. At present, the most in-demand ICT jobs in the province are:

(1)   technical support analysts/technicians

(2)   multimedia designers / graphic illustrators

(3)   computer / network systems engineers

(4)   data analytics / database architects/administrators

(5)   software / GUI developers

ICT professionals are well compensated in Saskatchewan (table 4).

Table 4.   Average salaries in ICT jobs — Saskatchewan

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	96,000
telecommunication carrier managers	91,000	98,000
electrical and electronics engineers	88,000	91,000
computer engineers	83,000	90,000
information systems analysts and consultants	72,000	77,000
database analysts and data administrators	68,000	70,000
software engineers	82,000	80,000
computer programmers and interactive media developers	63,000	64,000
web designers and developers	43,000	45,000
electrical and electronics engineering technologists and technicians	59,000	69,000
computer network technicians	57,000	59,000
user support technicians	49,000	52,000
systems testing technicians	51,000	68,000
broadcast technicians	54,000	76,000
graphic designers and illustrators	41,000	36,000

Source: ICTC

MANITOBA

18,000 ICT professionals were employed in Manitoba in 2013. The digital economy labour market in Manitoba is overwhelmingly Winnipeg-centric; nine out of ten ICT jobs are located in this city. Winnipeg recently further consolidated its position as the leading digital economy cluster in Manitoba, as ICT employment increased by 20% (⬆2,600) there in the past year (figure 18).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

You can always discuss your additional city- and province-specific research and data requirements with ICTC researchers by clicking here.

Figure 18. ICT employment by cluster
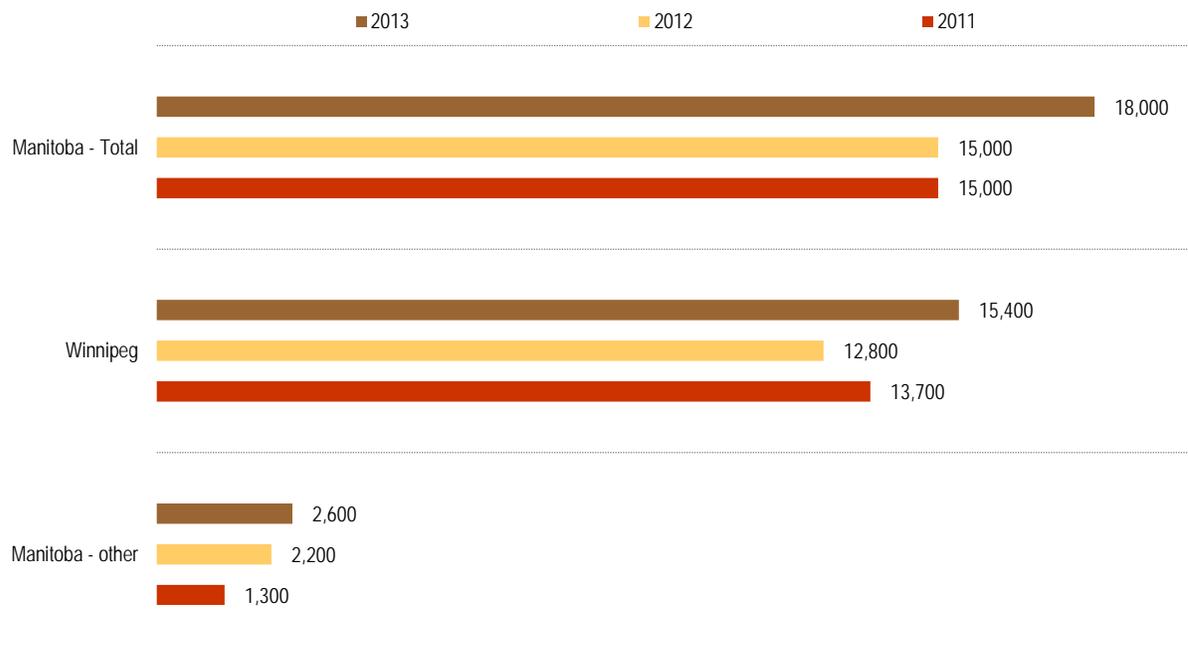
Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Manitoba. At present, the most in-demand ICT jobs in the province are:

(1) informatics / business systems analysts

(2) web / network support technicians/administrators

(3) multimedia designers / graphic illustrators

(4) technical support analysts/technicians

(5) software / GUI developers

ICT professionals are well compensated in Manitoba (table 5).

Table 5.   Average salaries in ICT jobs — Manitoba

| Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	87,000
telecommunication carrier managers	91,000	79,000
electrical and electronics engineers	88,000	81,000
computer engineers	83,000	83,000
information systems analysts and consultants	72,000	72,000
database analysts and data administrators	68,000	69,000
software engineers	82,000	75,000
computer programmers and interactive media developers	63,000	63,000
web designers and developers	43,000	36,000
electrical and electronics engineering technologists and technicians	59,000	64,000
computer network technicians	57,000	57,000
user support technicians	49,000	50,000
systems testing technicians	51,000	54,000
broadcast technicians	54,000	36,000
graphic designers and illustrators	41,000	38,000

Source: ICTC

ONTARIO

363,000 ICT professionals were employed in Ontario in 2013. Of them, 197,000 worked in Toronto (greater Toronto area), 75,000 worked in Ottawa (Ottawa-Gatineau), 7,400 worked in Kitchener-Waterloo region, and another 83,000 worked in the rest of the province. Since 2011, Ottawa consolidated its positions as one of the leading digital economy clusters in not only Ontario, but in Canada. ICT employment in Ottawa increased by 29% (⬆16,700) in this period. On the other hand, over half the jobs in Kitchener-Waterloo were lost, due mainly to the turbulence at Blackberry (figure 19).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

You can always discuss your additional city- and province-specific research and data requirements with ICTC researchers by clicking here.

Figure 19. ICT employment by cluster
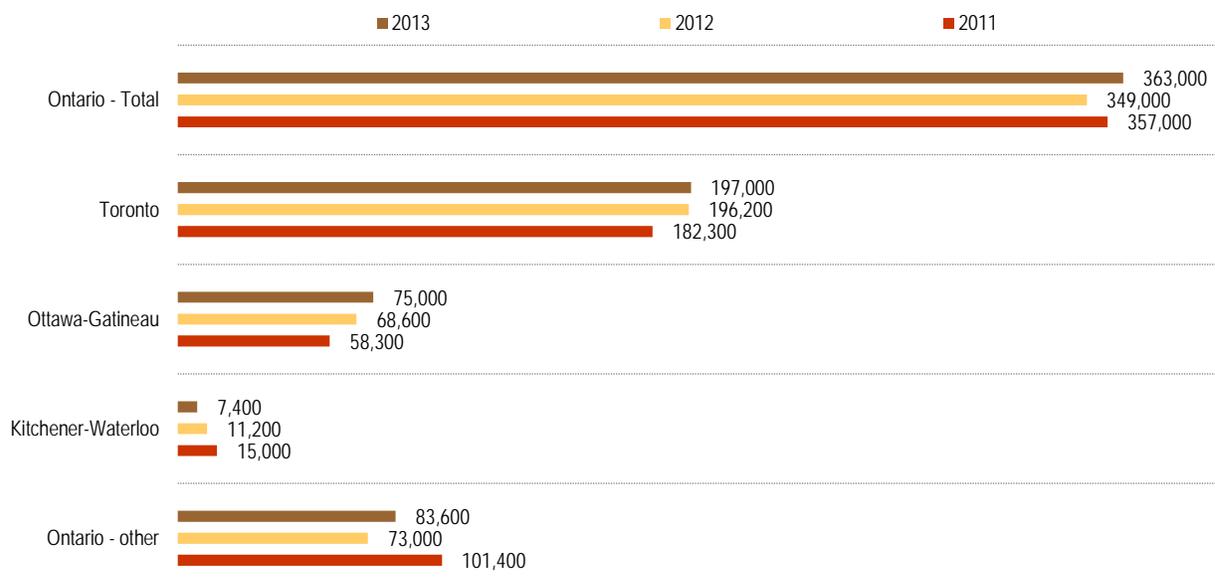
Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Ontario. At present, the most in-demand ICT jobs in the province are:

    (1)   technical support analysts/technicians

    (2)   multimedia designers / graphic illustrators

    (3)   electronics technologists/technicians

    (4)   software / GUI developers

    (5)   electronics/electrical engineers

ICT professionals are well compensated in Ontario (table 6).

Table 6.   Average salaries in ICT jobs — Ontario

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	112,000
telecommunication carrier managers	91,000	102,000
electrical and electronics engineers	88,000	94,000
computer engineers	83,000	94,000
information systems analysts and consultants	72,000	79,000
database analysts and data administrators	68,000	74,000
software engineers	82,000	91,000
computer programmers and interactive media developers	63,000	72,000
web designers and developers	43,000	49,000
electrical and electronics engineering technologists and technicians	59,000	60,000
computer network technicians	57,000	64,000
user support technicians	49,000	55,000
systems testing technicians	51,000	58,000
broadcast technicians	54,000	59,000
graphic designers and illustrators	41,000	46,000

Source: ICTC

QUEBEC

199,000 ICT professionals were employed in Quebec in 2013. Of them, 130,000 worked in Montreal, 28,000 worked in Quebec City, and another 40,000 worked in the rest of the province. Since 2011, Montreal further consolidated its position as the leading digital economy cluster in Quebec, as ICT employment in Montreal increased by 16% (⬆18,000) (figure 20).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

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Figure 20. ICT employment by cluster
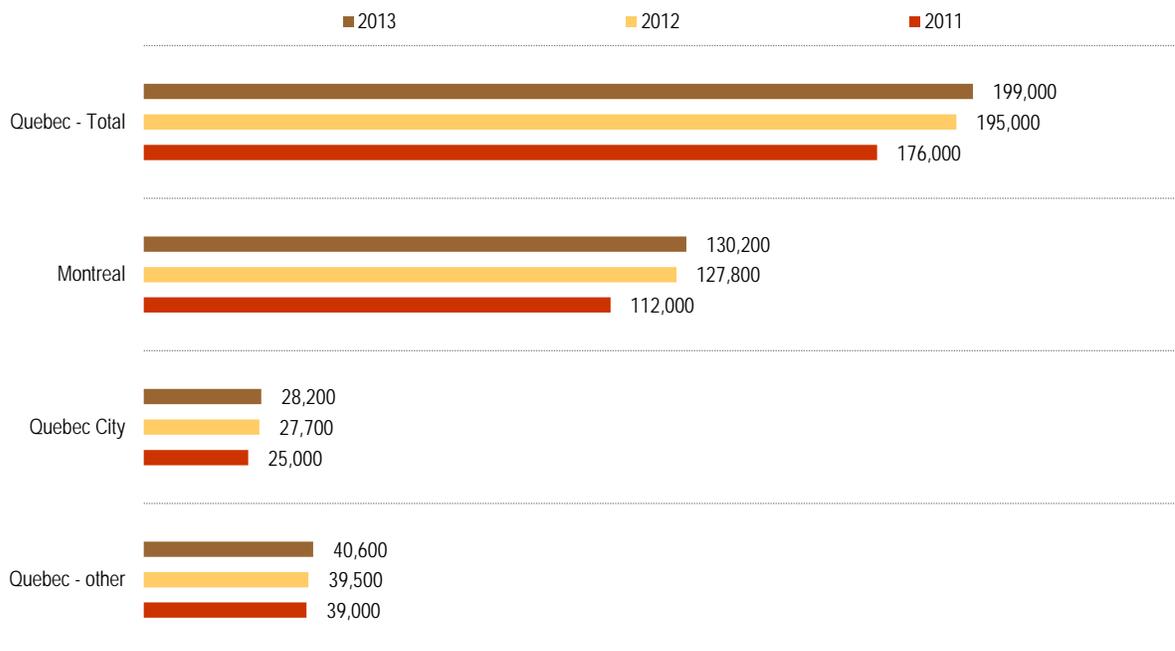
Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Quebec. At present, the most in-demand ICT jobs in the province are:

(1)   technical support analysts/technicians

(2)   multimedia designers / graphic illustrators

(3)   web developers

(4)   data analytics / database architects/administrators

(5)   electronics/electrical engineers

ICT professionals are well compensated in Quebec (table 7).

Table 7.   Average salaries in ICT jobs — Quebec

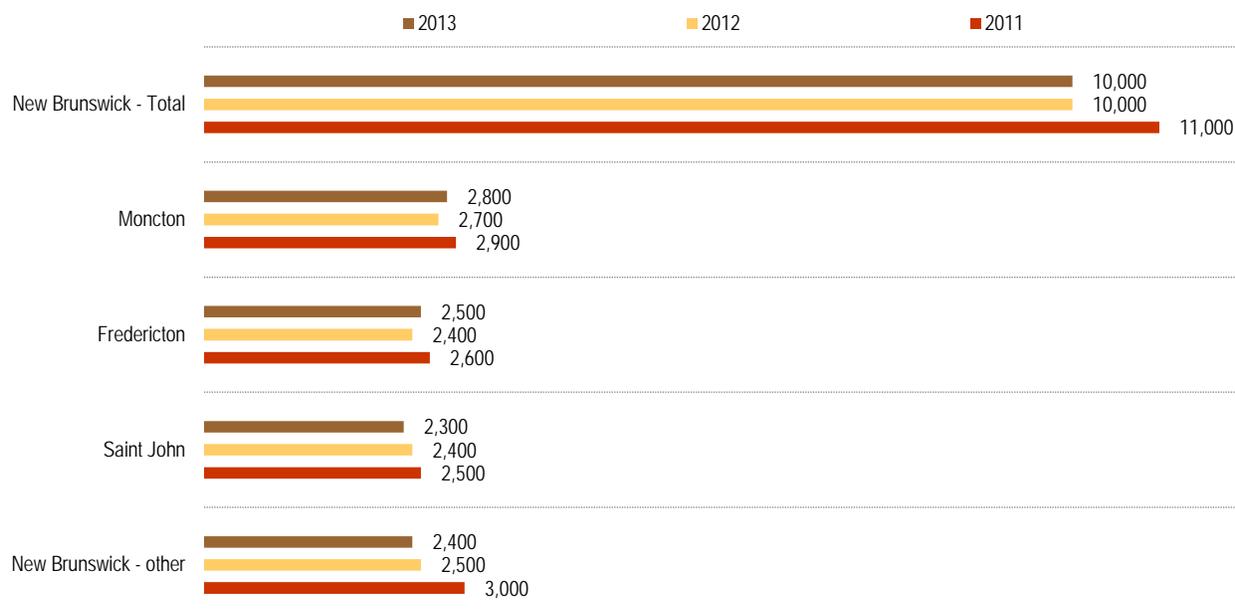| Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	94,000
telecommunication carrier managers	91,000	91,000
electrical and electronics engineers	88,000	86,000
computer engineers	83,000	81,000
information systems analysts and consultants	72,000	72,000
database analysts and data administrators	68,000	70,000
software engineers	82,000	83,000
computer programmers and interactive media developers	63,000	58,000
web designers and developers	43,000	45,000
electrical and electronics engineering technologists and technicians	59,000	60,000
computer network technicians	57,000	55,000
user support technicians	49,000	47,000
systems testing technicians	51,000	39,000
broadcast technicians	54,000	54,000
graphic designers and illustrators	41,000	36,000

Source: ICTC

NEW BRUNSWICK

10,000 ICT professionals were employed in New Brunswick in 2013. Of them, 2,800 worked in Moncton, 2,500 worked in Fredericton, 2,300 worked in Saint John, and another 2,400 worked in the rest of the province. None of these metropolitan areas managed to outperform the other two in recent years to establish itself as the leading digital economy cluster in New Brunswick. ICT employment in the province and its leading digital economy clusters remained stable since 2011 (figure 21).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

You can always discuss your additional city- and province-specific research and data requirements with ICTC researchers by clicking here.

Figure 21. ICT employment by cluster

Source: ICTC; Statistics Canada

Demand for ICT skills is robust in New Brunswick. At present, the most in-demand ICT jobs in the province are:

    (1)   electronics/electrical engineers

    (2)   information systems managers

    (3)   data analytics / database architects/administrators

    (4)   telecommunications services/operations/facilities managers

    (5)   technical support analysts/technicians

ICT professionals are well compensated in New Brunswick (table 8).

Table 8.   Average salaries in ICT jobs — New Brunswick

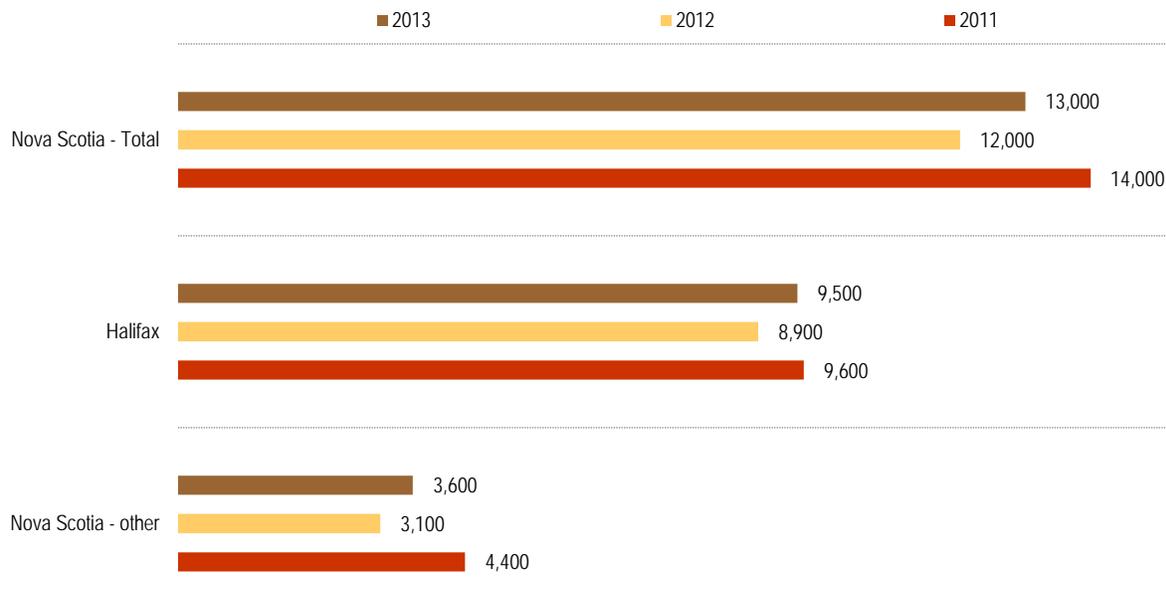| Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	90,000
telecommunication carrier managers	91,000	80,000
electrical and electronics engineers	88,000	96,000
computer engineers	83,000	75,000
information systems analysts and consultants	72,000	64,000
database analysts and data administrators	68,000	64,000
software engineers	82,000	69,000
computer programmers and interactive media developers	63,000	54,000
web designers and developers	43,000	37,000
electrical and electronics engineering technologists and technicians	59,000	67,000
computer network technicians	57,000	54,000
user support technicians	49,000	41,000
systems testing technicians	51,000	51,000
broadcast technicians	54,000	32,000
graphic designers and illustrators	41,000	35,000

Source: ICTC

NOVA SCOTIA

13,000 ICT professionals were employed in Nova Scotia in 2013. The digital economy labour market in Nova Scotia is overwhelmingly Halifax-centric, as three out of four ICT jobs are located in this city. Halifax recently further consolidated its position as the leading digital economy cluster in Nova Scotia, as ICT employment increased by 7% (⬆600) in Halifax in the past year (figure 22).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

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Figure 22. ICT employment by cluster

Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Nova Scotia. At present, the most in-demand ICT jobs in the province are:

    (1)   information systems managers

    (2)   data analytics / database architects/administrators

    (3)   software / GUI developers

    (4)   web / network support technicians/administrators

    (5)   electronics technologists/technicians

ICT professionals are well compensated in Nova Scotia (table 9).

Table 9.   Average salaries in ICT jobs — Nova Scotia

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	90,000
telecommunication carrier managers	91,000	76,000
electrical and electronics engineers	88,000	82,000
computer engineers	83,000	73,000
information systems analysts and consultants	72,000	69,000
database analysts and data administrators	68,000	57,000
software engineers	82,000	74,000
computer programmers and interactive media developers	63,000	55,000
web designers and developers	43,000	43,000
electrical and electronics engineering technologists and technicians	59,000	63,000
computer network technicians	57,000	60,000
user support technicians	49,000	41,000
systems testing technicians	51,000	48,000
broadcast technicians	54,000	82,000
graphic designers and illustrators	41,000	37,000

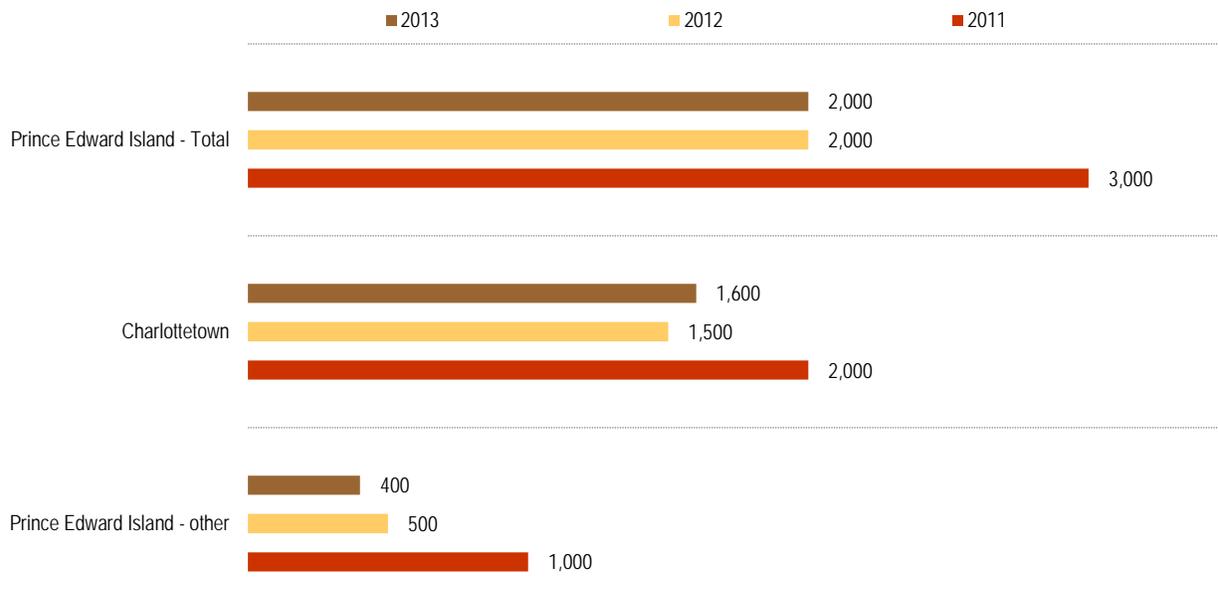Source: ICTC

PRINCE EDWARD ISLAND

2,000 ICT professionals were employed in Prince Edward Island in 2013. The digital economy labour market in Prince Edward Island is very Charlottetown-centric, as four out of five ICT jobs are located in this city. Charlottetown recently further consolidated its position as the leading digital economy cluster in Prince Edward Island, as ICT employment increased by 7% (⬆100) in Charlottetown in the past year (figure 23).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

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Figure 23. ICT employment by cluster

Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Prince Edward Island. At present, the most in-demand ICT jobs in the province are:

(1)   software testers / systems technicians

(2)   software / GUI developers

(3)   electronics technologists/technicians

(4)   computer / network systems engineers

(5)   telecommunications services/operations/facilities managers

ICT professionals are well compensated in Prince Edward Island (table 10).

Table 10.   Average salaries in ICT jobs — Prince Edward Island

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	103,000
telecommunication carrier managers	91,000	76,000
electrical and electronics engineers	88,000	85,000
computer engineers	83,000	73,000
information systems analysts and consultants	72,000	76,000
database analysts and data administrators	68,000	56,000
software engineers	82,000	76,000
computer programmers and interactive media developers	63,000	57,000
web designers and developers	43,000	29,000
electrical and electronics engineering technologists and technicians	59,000	47,000
computer network technicians	57,000	51,000
user support technicians	49,000	39,000
systems testing technicians	51,000	38,000
broadcast technicians	54,000	32,000
graphic designers and illustrators	41,000	46,000

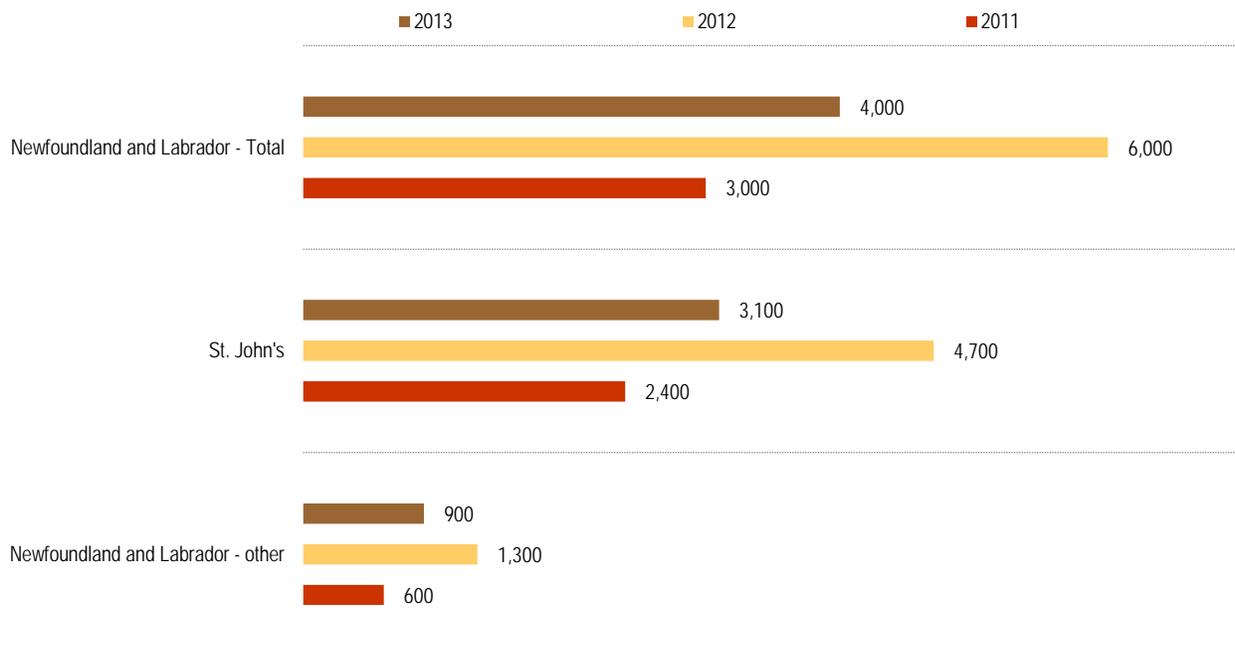Source: ICTC

NEWFOUNDLAND AND LABRADOR

4,000 ICT professionals were employed in Newfoundland and Labrador in 2013. St. John's is the leading digital economy cluster in the province, as four out of five ICT jobs in Newfoundland and Labrador are located in this city. Following a temporary surge in 2012, ICT employment stabilized and increased by 29% (⬆700) in St. John's compared to 2011 (figure 24).

We note that the leading digital economy clusters in the province are located in major urban centres. Growth in the digital economy can further improve if smaller/rural centres can be made an effective part of this economy.

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Figure 24. ICT employment by cluster

Source: ICTC; Statistics Canada

Demand for ICT skills is robust in Newfoundland and Labrador. At present, the most in-demand ICT jobs in the province are:

(1)   telecommunications services/operations/facilities managers

(2)   multimedia designers / graphic illustrators

(3)   web developers

(4)   electronics/electrical engineers

(5)   information systems managers

ICT professionals are well compensated in Newfoundland and Labrador (table 11).

Table 11.   Average salaries in ICT jobs — Newfoundland and Labrador

Occupation Title	Gross annual salary (national average $)	Gross annual salary (provincial average $)
computer and information system managers	99,000	87,000
telecommunication carrier managers	91,000	85,000
electrical and electronics engineers	88,000	111,000
computer engineers	83,000	73,000
information systems analysts and consultants	72,000	74,000
database analysts and data administrators	68,000	56,000
software engineers	82,000	72,000
computer programmers and interactive media developers	63,000	60,000
web designers and developers	43,000	28,000
electrical and electronics engineering technologists and technicians	59,000	69,000
computer network technicians	57,000	64,000
user support technicians	49,000	49,000
systems testing technicians	51,000	45,000
broadcast technicians	54,000	40,000
graphic designers and illustrators	41,000	31,000

Source: ICTC

3.   WHAT THE COMING YEAR HOLDS

Canada's digital economy has recovered well and emerged stronger from the uncertainties following the global financial crunch of 2008-2009. The jobless rate remained steady for ICT professionals at 2.9% for the third consecutive year. Real gross domestic product (GDP) produced by the Canadian ICT sector increased by over $1 billion compared to 2012, contributing $69.3 billion to Canadian GDP in 2013. This increasing trend is set to continue, as initial data shows that ICT sector's contribution to Canadian GDP has grown further in early 2014.

While Ontario continues to be Canada's leading digital economy employer, all provinces are facing challenges with respect to matching available talent and skills with the needs of their respective local economies. The ICT workforce continues to experience considerable imbalance in terms of gender diversity and is wrestling against a rapidly increasing workforce age profile. ICT workers are well educated and their educational attainment continues to improve. Of late, improving labour market conditions are encouraging many to return to the labour market sooner rather than later.

Canada's ICT professionals are increasingly better paid, having witnessed continuous growth in their earnings since the turn of the century. The current national average salary in ICT jobs is $72,000, increasing from $53,000 in 2000, $59,000 in 2005, and $67,000 in 2010. Many employers are planning to further increase salaries in the coming year.

Canada is well positioned to fully leverage the digital economy, a catalyst for job creation, innovation, and growth. Competing in today's digital economy requires a company to utilize technology in order to boost productivity. A workforce that can effectively use the technology is essential for any company to realize a productivity advantage. In addition to having higher skilled ICT professionals in the roster, employers also need to be proactive to up-skill the non-ICT professionals to increase their understanding of the impact and potential of technology. Given the fact that today's mid-level professionals will have to assume greater responsibilities rather quickly as the rather high proportion of experienced professionals retire, mid-level non-ICT professionals should be the focus of this up-skilling in particular.

Consultation with ICT service providers during many of our recent research initiatives reveals that many of the SMEs need an injection of capital to grow their operations and are finding it challenging to access the required level. Finding solutions to enable small- and medium-sized enterprises (SMEs) access the same level of capital as the large corporations is critical to make SMEs more competitive. The recent Digital Canada 150 announcement of the Government of Canada's support to help SMEs adopt digital technologies is a strong step in this direction. Empowering today's and tomorrow's workforce is vital for Canada's competitiveness in a global economy.

ABOUT ICTC

The Information and Communications Technology Council (ICTC) is a leading not-for-profit national centre of expertise conducting research, policy development, and creating talent solutions for the digital economy.

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DIGITAL ECONOMY LABOUR FORCE

ICTC's labour market research captures critical economic and labour market indicators to inform competitive business and human resource strategy planning, decision-making and career development in ICT, thereby driving the development of a more prosperous Canadian ICT workforce and industry in a global digital economy.

The sum total of workers (workers that are employed in these occupations as well as workers that are currently unemployed, but actively looking for work) in these occupations and workers in all other (non-ICT) occupations in the ICT sector (ICTC's framework of Canada's ICT sector is explained below) is the total digital economy labour force in Canada. The table below summarizes the core ICT occupations:

Index	NOC Code	Occupation Title
1	0131	telecommunication carrier managers
2	0213	computer and information system managers
3	2133	electrical and electronics engineers
4	2147	computer engineers
5	2171	information systems analysts and consultants
6	2172	database analysts and data administrators
7	2173	software engineers
8	2174	computer programmers and interactive media developers
9	2175	web designers and developers
10	2241	electrical and electronics engineering technologists and technicians
11	2281	computer network technicians
12	2282	user support technicians
13	2283	systems testing technicians
14	5224	broadcast technicians
15	5241	graphic designers and illustrators

ICT SECTOR

The table below summarizes the ICT sector:

Index	NAICS Code	ICT Sub-sector
1	3333	Commercial & Service Industry Mach. Manuf.
2	3341	Computer & Peripheral Equip. Manuf.
3	3342	Communications Equip. Manuf.
4	3343	Audio & Video Equip. Manuf.
5	3344	Semiconductor & Other Electronic Component Manuf.
6	3345	Navigational, Medical & Control Instruments Manuf.
7	4173	Computer & Comm. Equip. & Supplies Wholesale distribution
8	5112	Software Publishers
9	5171	Wired Telecommunications Carrier
10	5172	Wired Telecommunications Carrier (except satellite)
11	5174	Satellite Telecommunications
12	5179	Other Telecommunications
13	5182	Data Processing, Hosting, and Related Services
14	5415	Computer Systems Design & Related Serv.
15	8112	Electronic & Precision Equip. Repair & Maintenance