



Information and Communications
Technology Council

Conseil des technologies de l'information
et des communications



Digital Adoption, Advancing Canada's place in a global economy

Introduction

The global economy is upon us and emerging digital technologies such as mobile apps, digital platforms, and cloud architectures have the potential to create Canadian competitive advantage and boost productivity and innovation – but only if the advanced capabilities of those technologies are adopted by Canadian enterprises in the private and public sectors.

This manifesto (or roadmap) is intended to identify the key catalysts for digital adoption in Canada and address all components of the business ecosystem in Canada, including: the industry (large and small), the educational system, and policy makers. Only with a collective effort can this agenda be moved forward.

For the past two years, the Information and Communications Technology Council (ICTC) has been conducting forward-looking research exploring the contributions made to the Canadian economy by various emerging technologies. Technological innovations are re-defining enterprise opportunities. Global markets are a click away, collaboration tools and social media are revolutionizing how we communicate and work, and mobile technologies are slowly making geography irrelevant to doing business.

Large organizations in Canada often have the capacity to fully embrace technology as a competitive advantage. But, the composition of Canada's industry is one of small- and medium-sized enterprises (SMEs). In fact over 75% of Canada's industry is represented by organizations of fewer than 10 employees. These organizations have limited resources and find it the hardest to adopt technologies. This paper is intended as a roadmap for such organizations to assist them to understand the catalysts and chart a path forward.

ICTC asserts that just a 1% increase in labour productivity as the result of adopting mobile technology would yield \$2.5 billion to the Canadian economy – \$8 billion if multiple emerging technologies were well-adopted. Yet, today, just half of Canadian enterprises have enabled mobile solutions across their entire workforce.ⁱ

Despite the compelling argument for greater technology adoption, Canadian enterprises and especially SMEs have not embraced emerging technologies to the degree necessary to fuel the economy to go full speed. Education about technology's benefits, resources to train and workers including managers and executives, and capital to purchase the necessary equipment and services are often lacking.

Given Canada's expanded trade liberalization with several countries, the incentive to equip our industry with technologies to conduct cross border e-business will be vital going forward. The opening of trade in electronic





services, for example, between the European Union and Canada will serve as a powerful incentive to Canadian companies to upgrade their technology infrastructures to allow for, for example, e-commerce and other services necessary to compete globally.



Instances of how emerging and advanced technology is boosting productivity and innovation are not hard to find:

- In the retail and manufacturing sectors, there are clear benefits to productivity by adopting technology: mobile, cloud and app ecosystems can accelerate e-commerce, inventory control, and supply chain management among many others to help significantly enhance the productivity factor of many SMEs. Improved use of data and analytics offer the potential to significantly improve market research efforts by looking at customer behaviour.
- Service delivery innovations: This ecosystem can build innovative services for consumers in enabling remote monitoring and diagnostics capabilities, data analytics and service offerings, advanced automation and robotics enablement.
- New analytics capabilities leveraging the cloud and high-performance computing are revolutionizing the financial services sector. Investment and retail banking are taking advantage of new insights to mitigate risks, create new products, and create better predictive models.
- In the healthcare sector, offices are becoming paperless and patient flows through hospitals are being improved by health information management. Apps are taking advantage of increasingly powerful device capabilities to improve home health care and support aging-in-place strategies.

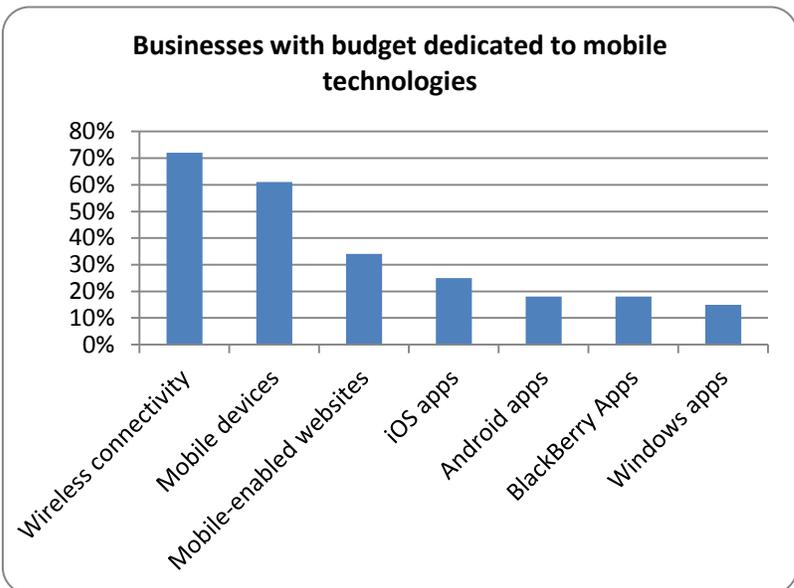
To address these and nearly unlimited other opportunities, a concerted effort will be required on the part of all stakeholders: industry, government, educators and workers.

This paper, a joint effort by the Information and Communications Technology Council, *CATAAlliance* and the CIO Association of Canada, explores in a short space the opportunities that exist to accelerate digital adoption by Canadian enterprises, the challenges to greater adoption, concrete solutions for overcoming those, and suggested next steps. We invite all stakeholders to get involved to make our Digital Adoption Campaign a success.

We hope this paper provides a concise road map to assist organizations – particularly small- and medium-sized enterprises – understand the catalysts and plan their approach for digital adoption. Further, we consider that policy makers and large enterprises, including multinational enterprises, will benefit from understanding the contributions that they can make: nurturing a strong domestic ecosystem, supporting underlying education efforts and optimizing the broader policy context.

Context

One of ICTC's leading-edge technology studies was conducted in June 2013, exploring the contribution made by mobile technologies to the Canadian economy. In a survey of Canadian enterprises, ICTC found that too few have evaluated the value proposition that technology brings to their business or devoted budget to some of the underlying technologies discussed here.



Innovation is a key enabler of economic growth. An innovative economy able to capitalize on emerging technologies is better prepared to compete in the global digital economy. ICTC has undertaken a series of studies on emerging technologies in order to scope out and define their impact on the Canadian economy at large. These emerging technologies are the drivers of innovation in the digital economy. Not only are they ushering in a new ICT paradigm, they are redefining organizational capacity and creating new opportunities for productivity gains.

ICTC's February 2014 submission to Industry Canada's consultation on innovationⁱⁱ includes a snapshot of the economic impact of emerging tech innovation on the Canadian economy:

- **Mobile apps:** The Canadian app economy directly employs 41,300 professionals, and generates \$775 million in revenue annually. Generated revenues are estimated to reach \$1.19 billion in 2014 and \$2.2 billion in 2016.
- **Mobile technology:** An estimated 410,000 people are employed in Canada as a result of wide adoption of mobile technology. The total number of new jobs to be created by 2017 in mobile technologies and related services is approximately 40,000. More than 90% of Canadian businesses use mobile technologies for anywhere connectivity (e.g. checking emails etc.), and 69% to enable employees to work from remote locations. A significant investment by enterprises in sophisticated mobile technologies would yield productivity and ecosystem benefits.
- **Cloud computing:** Half of Canadian businesses (IT and non-IT) have adopted identifiable cloud services. 70% of cloud-using enterprises use some form of paid cloud service. Canada's cloud economy directly employs 38,500 workers, which contribute more than \$4.6 billion to Canadian GDP. When we factor indirect employment, Canada's cloud economy has generated more than 48,000 total jobs. Total cloud economy and related employment is projected to exceed 71,000 by 2018. Direct employment in the cloud industry will contribute more than \$8 billion annually to Canadian GDP in 2018. With appropriate training and re-skilling, potential job losses can be mitigated.
- **Digital platforms – online, cloud hosted services such as social media, content aggregators, third party content management and more – and devices:** 75% of Canadian businesses employ digital platforms, and a total of 79,000 Canadians are employed as a result of the emergence and wide adoption of digital platforms. Digital platforms will create an estimated 18,000 to 22,000 new jobs by 2018. Canada's digital platforms ecosystem generates up to \$7.3 billion annually in GDP, a figure that will more than double to \$14.8 billion by 2018.



In a September 2013 study of digital platforms, ICTC found that 48% of companies that have adopted digital platforms have seen an increase in revenue of 10% or more attributable to marketing on digital platforms.

Despite these compelling numbers, however, around half of Canadian businesses don't allocate any resources to using digital platforms. **Access to capital and other resources, and finding the right staff, are the key hurdles, according to ICTC's research.**



The potential for these emerging technology sub-sectors to contribute to Canadian national prosperity will depend in part on the degree to which capital is available to fund entrepreneurs and early-stage small- and medium-sized enterprises, how skilled talent is identified, recruited, retained and trained, and the success of creating an innovation culture in the workplace.

Outreach

ICTC with its partners CATAAlliance and CIOCAN has been active in its advocacy efforts to bolster digital adoption:

- CATAAlliance has for the last year featured industry leaders and visionaries describing how their enterprises have benefitted from technology adoption;
- ICTC addressed the need for measures that will boost capital availability and encourage innovation in its response to Industry Canada's consultation on Innovation;
- In March 2013, ICTC with the assistance of Export Development Canada hosted a forum of policy-makers, educators and industry leaders to explore the challenges to innovation on the part of small- and medium-sized enterprisesⁱⁱⁱ;
- In February 2014, ICTC hosted a high-level forum of stakeholders to explore the initiatives required to ensure that youth have the necessary skills to contribute to a digital, innovation economy.^{iv}

Our message has been consistent. There are measures described in the documents that range from innovative solutions such as implementing a "patent box" approach to funding technology development to more straightforward recommendations such as ensuring SR&ED tax credits are as streamlined as possible.

The authors believe that in addition to these, a broader change in Canadian corporate culture is urgently needed.

Put simply, technology, in our assessment, is not yet seen as an important enough part of executive and managerial discussions particularly in small to medium enterprises.

Chief Information Officers who understand technology and its potential too often oversee departments or responsibilities that are considered cost centres to the enterprise, rather than enablers of greater revenue, profits, and innovation.

The consortium partners are pleased to note the recent release of *Digital Canada 150*, Canada's federal national digital strategy. The heads of all three organizations congratulate Minister Moore on his call to action to "position Canada among the world's leaders in adopting digital technologies" that will be well-served by initiatives to:

- Invest \$200 million to help small- and medium-sized businesses adopt digital technologies, and a \$300 million VC boost for digital companies;
- Invest \$40 million to support 3,000 internships in high-demand fields;
- Increase funding for the Canada Accelerator and Incubator Program to \$100 million; and,
- Provide \$36 million in funding to provide repaired/refurbished computers to libraries, not-for-profit organizations, and Aboriginal communities.

The Government of Canada's new *Digital Canada 150* plan has five pillars, including a thrust to ensure that "Canadians will have the skills and opportunities necessary to succeed in an interconnected global economy."

This Digital Adoption Consortium considers that there are several further developments and initiatives that would be of considerable benefit to encouraging technology adoption that might be considered.

Investment to boost technology creation and adoption by SMEs

Small- and medium-sized companies constitute the large majority of businesses in Canada, and account for the bulk of employment in this country. They are Canada’s economic engine, but face significant challenges in adopting new and emerging technologies. The recent release of Digital Canada 150 strategy provided strong investment stimulus for technology adoption in Canada. The government has also introduced in the past incentive programs such as the Digital Technology Adoption Pilot Project (DTAPP) as part of the IRAP. This was an innovative program that may warrant reintroducing given its broad success in Canada. The program was established as a three-year pilot to deliver technology adoption to support for small and medium sized enterprises from November 2011 to March 2014. Dozens of success stories stemming from the program are described on the NRC’s web site.^v By helping to overcome short-term technology investment challenges, SMEs have been able to bolster their performance and ready themselves for a global, digital economy.



More broadly, the Consortium partners consider that the private sector itself has a significant role to play.

- The large to small ecosystem: Large multinational companies operating in Canada are in a unique position to help the entire ecosystem of technology companies in Canada, as well as non-ICT companies, adopt beneficial technologies. In 2013, at a meeting of stakeholders organized by ICTC and its partner Export Development Corporation, the benefits of multinational help for Canadian SMEs were highlighted. Multi-national enterprises can assist smaller companies to integrate into, for example, supply chains by providing technology adoption loans and favourable vendor financing for back-end systems, automation, and other modernization efforts.

Advantageous vendor financing, procurement policies, technology transfer, case study sharing and other mechanisms minimize the cash investment needed to help SME partners adopt technology to all partners’ advantage.^{vi} This nurturing would likely need to be incented through tax credits or other public incentives.

Large companies should consider assisting smaller Canadian ones by helping them adopt the technology necessary to integrate into global supply chains, or adopt technologies that strengthen the whole ecosystem.

- Favourable taxation policies: Innovation that results in intellectual property could be better supported in Canada. In its above-mentioned submission to Industry Canada’s innovation policy consultation, ICTC urged, for example, the adoption of a “patent” box approach that rewards companies for the commercialization of IP such as has been adopted in the United Kingdom.

Canadian enterprises are able to avail themselves of excellent programs such as the Scientific Research and Experimental Development tax credit, but a patent box or innovative mechanisms such as crowdfunding should be implemented to bolster the pool of capital available to innovative, early-stage technology companies that are otherwise not as well served by risk-averse Canadian financial institutions.^{vii}

Human Factors (talent and culture)

One of the key challenges relayed in multiple ways to ICTC with respect to technology adoption is the lack of technology understanding within the organization. In small enterprises that may not have dedicated technical staff, or even in medium and larger-sized enterprises in which talent has been trained for an earlier environment, there is often a lack of specific emerging technology expertise. Business leaders and their staff may have a cursory understanding of how to use technology such as desktops or even tablets and smartphones. But there is a general lack of awareness about how these technologies can be married with business needs to innovate. While the corporate leadership of an organization is the main impetus for technology adoption, the main cultural challenge arises once the decision has been made to adopt innovative technologies. An organization that always relied on paper processes, for instance will require significant change management to adopt mobility.



Addressing talent and culture considerations requires broad measures that both address general digital literacy and facility with technology, as well as specific, targeted up-skilling.

- Finding skilled talent and building a continuous talent supply is an ongoing challenge.

SMEs should be encouraged to build links with the educational system in schools, colleges and universities to ensure a healthy supply of the skills necessary to create and adopt innovative technologies.

- Given the fast-paced nature of technology, SMEs should consider establishing training programs with vendors, educational and professional development organizations as a continuous means of up-skilling their organizations on the latest technologies and their implications on business value.

For corporate and business managers, up-skilling and continuous learning will be a critical factor in maintaining competitiveness. Digital leadership competencies will be critical. Business leaders should seek opportunities to continuously train their staff, and even more importantly themselves, about the state of technology and its enterprise benefits.

ICTC offers tools and training materials that can introduce non-domain experts to emerging technologies in ways that are targeted to enterprise adoption.

At the same time as all Canadians need to be equipped with digital skills, many of the digital economy's future jobs will require specialized technology training to develop domain expertise. Private career colleges are ideally





placed to offer targeted training that meets immediate industry needs.

At the university and college level, greater use of vocational training including through co-ops and placements should be employed to ensure skills are immediately relevant when students graduate into the workplace.

Mentoring and guidance

In order to make rapid and systematic and measurable progress towards improved productivity in non-tech SMEs is by having a dedicated resource of people who work directly with them to coach/advise/educate them on improved use of technology.

In a manner similar to how the Government of Canada's Industrial Research Assistance Program has approximately 250 experienced Industrial Technology Advisors on the ground to coach/advise/educate tech-based SMEs on how to grow their business and develop new technology products and services, the most direct way to help non-tech SMEs is with a dedicated network of "Digital Technology Adoption Advisors". This network should be set up as quickly as possible.

Each DTAA would work directly with 20-50 non-tech SMEs per year to help them with adopting new technologies and measuring their improved performance/productivity.

Open data

Public bodies in Canada generate overwhelming volumes of data that could be a powerful incentive to Canadian enterprises to adopt emerging technologies in their business processes. From market research to scientific exploration, access to the data created through nationwide collection mechanisms and publicly-funded research is a potentially rich incentive to adopt digital technology in the workplace. There are multiple hurdles in place to using that data – and an understanding of cloud network architectures, applications and analytics are fundamental to taking advantage of that opportunity. With sufficient understanding of the technologies used to access, analyze and use that data, Canadian enterprises can bring their enterprises to new levels of competitiveness.

The use by small and medium-sized enterprises would benefit from catalysts including training in understanding the tools and standards to mine and interpret big data.

From high-powered computing to access to open data sources and the training necessary to take advantage of those, policies at research institutions and by governments should consider small business in their operating models and offerings to have the greatest impact for the largest number of Canadians. Further, the necessary funding to acquire technologies to enable new offerings in this arena should be made available.

Open data initiatives such as are being championed by Treasury Board, the Ontario provincial government, and various municipalities are all critical to this effort. A coordinated effort to collect this data into centrally-organized (if not hosted) and make it easily accessible is critical. The greater the level of cooperation between government agencies, private sector participants and NGOs, the greater level there will be of common meta-tagging, information architectures and taxonomies.

The partners consider that it would be beneficial to establish a program/incubator designed to help small and medium enterprises acquire the competences and resources they need to develop innovative content and data

analytics services, and the development of services based on the use of available data, particularly from public organizations.

Building Trust & Security

Building trust in electronic services will be critical to encouraging adoption of emerging technology platforms and services. Whether in financial services, retail, health care or others, Canadians will be loath to adopt technology, especially in an enterprise setting, where trust is lacking. Cyber-crime, identity theft and spam erodes trust in digital communications and platforms. The government's initiatives such as on spam are welcome policy approaches to mitigating the harmful impact of security challenges online. Canada's Anti-Spam Legislation (CASL), for instance, will reduce the amount of unsolicited commercial emails that erode trust in using electronic communications channels. One potentially beneficial change would be a review of the now-aging *Personal Information Protection and Electronic Documents Act* to ensure it is completely relevant to the modern web and Internet environment.



Possibly just as important, though, are media and digital literacy skills premised on critical thinking skills that can help Canadians avoid common security and privacy challenges. Problems are commonly encountered by Canadians unaware of how privacy and security breaches are accomplished, or of best practices in avoiding those. Critically assessing the source of content is critical.

A basic understanding of communications architectures, including of how cloud and mobile services work, could help Canadians feel more secure both in using online services (which would be an incentive to provide them), as well as to adopt technology in the workplace with the goal of offering new services and using it to do business better.

As enterprises adopt technologies that have rich interaction with users at their core, the risks for privacy and security grow. New services and applications, including the cloud and HPC/analytics are largely of benefit to Canadians and to business, but adopters should be mindful of potential security and privacy challenges. Privacy by design and security by design, are two inter-related concepts of building enterprise architecture that treat security not as something to be dealt with reactively, but from the ground up to be proactive. Proponents of security and privacy by design note the potential to reassure customers and users of their privacy and security to create positive ROI. Ann Cavoukian, Ontario's privacy commissioner, is a noted advocate of by-design approaches to building trust and protection.^{viii}

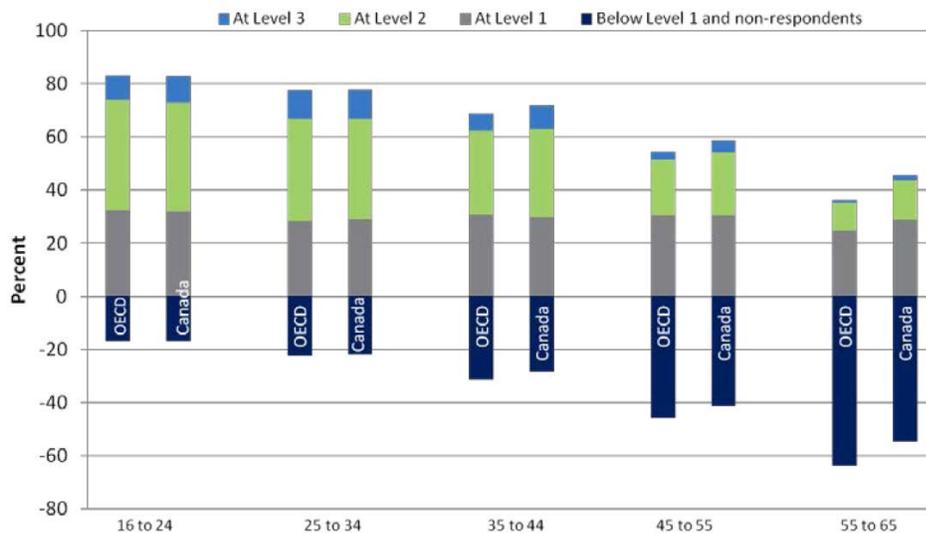
When adopting new technology, enterprises should pursue security-by-design and privacy-by-design enterprise architecture approaches.

Digital skills

Digital skills are not just necessary to stay safe online. They are critical to every facet of technology adoption. Beyond pointing-and-clicking, and the creation of basic documents, there are an increasing array of skills necessary in today's workforce to take full advantage of digital technology. New interfaces such as touchscreens and mobile operating systems, for some portions of the population, require new "languages" and relearning such skills as navigation and documentation. Fluency with social media is still not widespread, for example. The availability of

platforms such as Dropbox, Eventbrite, Twitter, WordPress, or Salesforce.com’s various platforms offer an array of DIY tools to non-IT staff. But using those in a business environment, and understanding their potential to create significant market value requires a fundamental level of technological proficiency.

In Canada, there are still far too few Canadians working at the highest level of what the OECD calls “problem-solving in a technology-rich environment” (PS-TRE). The chart above, created by the Council of



Ministers of Education, Canada (CMEC), shows that while Canada is performing well relative to its OECD peers, there are large swaths of the population grappling with emerging technologies from the position of lower levels of digital literacy. In the chart below, the PS-TRE is shown for age groups on the X-axis. Generally speaking, below Level 1, individuals can complete tasks in which the goal is explicitly stated, in a simple and familiar environment, with relatively few steps. At Level 3, users can complete tasks using multiple applications, many steps, challenges, in a new application environment, and plan ahead.

ICTC and partner MediaSmarts recently held a workshop with around 100 stakeholders from the education, industry and policy-making sectors to address the challenge of approving digital and media literacy and skills.^{ix}

Among the suggested approaches to digital literacy heard were that the specific competencies required by industry, and by the digital workforce writ large, must be incorporated into curriculum from a relatively early age; public education must be adequately funded; parents, as key partners in their children’s education, need to be equipped with digital skills, and that industry players have a responsibility to assist schools in teaching digital skills and literacy.

From early to high school, children should be taught not just how to swipe or click, but to think critically about information and its source, and the mechanics of delivering it through various levels of the IT stack. In high school, youth should delve more deeply into technology, with related literacy and numeracy subjects explicitly linked to practical applications, and with related business and financial learning. Career guidance to develop pathways into tech jobs must involve parents, industry representatives, teachers and peers.

In Canada, youth unemployment is high. This is particularly true of Aboriginal youth. And, women are still not adequately represented in the ranks of technology workers.



We consider that public education must do more to encourage a greater diversity of students to consider pursuing technology careers, and better equip all youth for eventual employment in the ICT sector.

More of Canada's populations under-represented in ICT careers (Aboriginal Canadians, for instance, and women) should be encouraged to pursue tech careers to boost the supply of talent available to companies adopting emerging technologies. Digital skills should be taught from the earliest age in public schools, in partnership with industry to understand required competencies.

Pricing and affordability



The adoption of emerging technologies such as mobile, apps, cloud, analytics and others will depend to a high degree on the cost of the underlying network connectivity, devices, services and other infrastructure. Internet connections, particularly, will be important – whether mobile or fixed. Nearly all of the innovation opportunities today are built on very high-speed Internet connectivity and the growing ubiquity of touchscreen devices that can take advantage of those.

An important adoption catalyst is the pricing for connections themselves – mobile and fixed.

Connectivity is not just a consumer issue, but affects upstream pricing as well. For example, the cost of running data centres or high-powered computing centres is affected by network pricing, and passed on to businesses and consumers.

Where market forces are not sufficient to entice technology adoption, tax and other financial incentive for priority sectors should be considered by policy makers.

Organizational culture and the role of the c-suite and owner-managers

Digital leadership is a necessary strategic executive competency in the 21st century economy. Traditionally, executives have been given or sought out training in competencies such as strategic thinking and management, financial skills, human resources, time management and others.

As digital tools become more ubiquitous – and the enterprise opportunities larger – it will be critical that all CxOs and small business leaders are conversant in digital technologies. Technology decisions that used to be the purview entirely of the CIO/CTO (desktop lifecycle management, network architecture, storage, etc.) are now much broader. The determination, for example, to implement an ecommerce platform or develop an app is one in which all executives must take part. The communication of enterprise advantage in adopting digital tools might start with the CIO, or the chief marketing officer, or the chief financial officer.

Not just CIOs, but the whole C-suite and Canada's cadre of business leaders should take responsibility for having informed digital adoption conversations.

Next step: A new digital adoption compass

Culture change, learning and information exchange are challenges. To researchers, vendors and policy-makers, the benefits of digital technology adoption may be clear. For business people, engaged as they are in a daily undertaking to further their enterprise aims, clarity is often lacking. Spurring greater enterprise adoption will require a concerted effort by large organizations, vendors and governments to actively demonstrate a roadmap for that adoption, and to demonstrate in clear and incontrovertible ways the return on investment for otherwise busy small business people.

To respond to this need, ICTC, *CATAAlliance* and CIOCAN have undertaken to build, for launch this fall, a Digital Adoption Compass. The Compass will be a one-stop-shop for enterprises of all sizes to learn more about the benefits of technology adoption from a vendor-neutral source. The Compass language will be geared toward business leaders. It will serve as a pathway to more in-depth training resources



To succeed, this hub will need the active engagement, with commitments of time and other resources, of larger enterprises and governments to create the conditions in which the entire Canadian economy can reap technology's rewards. Leveraging the power of social, video and other online tools, our aim is to create a repository of material that can help guide enterprises of all sizes and in all sectors in pursuing an adoption course and roadmap. We will be actively seeking the participation of multiple vendors, economic development agencies, ministries and others who can contribute the necessary documents, learning materials, coaching/mentorship and more.



Conclusion

The opportunity, as spelled out above, for technology to make a massive contribution to Canadian economic prosperity is large. Billions of dollars and hundreds of thousands of jobs could be added to the Canadian economy as the result of greater adoption of technologies such as cloud, mobile, apps, analytics, digital platforms and more.

In order to achieve this, however, there will need to be a concerted effort on the part of all stakeholders to help, particularly, small and medium sized enterprises and entrepreneurs become more familiar with technology's benefits, to demystify it, and to lay out a clear roadmap to adoption.

That is why we will be selecting several organizations across Canada that exemplify how such technologies were deployed to enhance their business proposition; how the talent strategies discussed here were implemented, how corporate culture and C-Suite/business involvement helped fast track decision making in technology adoption; how large organizations worked with the SME to adopt technology and strengthen their ecosystem, and more.

We invite all stakeholders to join us in this effort.

To connect with us please contact:

**Namir Anani, President and CEO, Information and Communications Technology Council
613.237.8551 | n.anani@ictc-ctic.ca**

ⁱ Information and Communications Technology Council, *Canada's Mobile Imperative*; Leveraging mobile technologies to drive growth. June 2013. http://www.ictc-ctic.ca/wp-content/uploads/2013/06/ICTC_CanadasMobileImperative_June2013.pdf

ⁱⁱ ICTC, *Advancing Canada's Comparative Advantage*, 31 January 2014. <http://www.ictc-ctic.ca/?p=19468>

ⁱⁱⁱ <http://www.ictc-ctic.ca/wp-content/uploads/2013/03/A-Road-Map-for-Canadian-Mobile-Apps-Stakeholders-Final.pdf>

^{iv} <http://www.ictc-ctic.ca/?p=19601>

^v http://search-recherche.nrc-cnrc.gc.ca/search/search.cgi?collection=irap_success_stories&form=nrc_e&scope=%2Feng%2Frap%2Fsuccess%2F&meta_l=eng&meta_s=&meta_s=pt_dtapp&meta_s=&meta_G=&meta_d1=&meta_d2=&query=

^{vi} ICTC, *Defining the Global Opportunity for Canadian Firms: A Road Map for Mobile Apps Stakeholders*, March 2013.

^{vii} Patent box rules, broadly speaking, provide preferential tax treatment to income earned from the commercialization of patents. While Canada's low-tax regime and technology R&D incentives aid in the undertaking of innovative research, a patent box regime could incent Canadian companies to exploit that IP from home, or to attract offshore entities to commercialize their IP from Canadian operations. Furthermore, the exploitation of IP often requires the input of other firms, and has the effect of encouraging clusters.

The highest-profile implementation of such a regime has been the United Kingdom, in which changes to legislation were finalized in April 2013. Anecdotal evidence suggests that enterprises have been sufficiently incented to move IP commercialization operations to that jurisdiction.

One analysis of patent box regimes, conducted by the C.D. Howe institute (*Improving the Tax Treatment of Intellectual Property Income in Canada* – April 2013) suggests that Canada could benefit from a similar regime. It has undertaken an analysis of patent transfers from 1986 to 2010 to suggest that jurisdictions that either have patent box regimes or are otherwise tax havens have been the beneficiaries of a steadily rising number of patent transfers. These have risen much more quickly than for other jurisdictions in which the number of transfers has been steadier, or even declining.

C.D. Howe has specifically recommended the implementation of a patent box in Canada, and has been joined in that call by organizations such as CATAAlliance and PwC. We lend our voice to that call.

^{viii} Cavoukian and Dixon, *Privacy and Security by Design: An Enterprise Architecture Approach*. September 2013.

http://www.ipc.on.ca/site_documents/pbd-privacy-and-security-by-design-oracle.pdf

^{ix} A full report of the Symposium's proceedings and findings is available at <http://www.ictc-ctic.ca/?p=20750>.