



# CANADA'S DIGITAL IMPERATIVE:

MEASURING DIGITAL PLATFORMS' LABOUR MARKET AND ECONOMIC IMPACT

DIGITAL | PLATFORMS | SOCIAL MEDIA | LABOUR MARKET | ECONOMY | CANADA

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**EXECUTIVE SUMMARY**

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**Section snapshot**

- ➔ 75% of Canadian businesses employ at least one segment of digital platforms for sharing, communicating, disseminating, and broadcasting purposes.
- ➔ 46% of Canadian businesses use social media platforms such as LinkedIn, Facebook, Twitter, or Reddit.
- ➔ 28% of businesses employ dynamic platforms featuring user-generated content such as YouTube or iTunes.
- ➔ 16% of enterprises use meeting applications such as FuzeBox, WebEx or GoToMeeting.
- ➔ ICTC estimates that 79,000 Canadians are employed as a result of the emergence and wide adoption of digital platforms.
- ➔ Up to 22,000 new digital platforms jobs are expected to be created between now and 2018. The total employment in the digital platforms segment will exceed 101,000 as a result.
- ➔ 68,000 of the current jobs are in enterprises that are utilizing digital platforms to gain efficiencies in their business processes.
- ➔ 11,000 of the current jobs are in companies that are providing digital platforms services.
- ➔ The Canadian digital platforms ecosystem currently contributes approximately \$7.3 billion annually to Canadian GDP, estimated to reach \$14.8 billion by 2018.
- ➔ Canadian service providers are making their mark with respect to providing digital platforms products and services globally; this subsector is now a \$1.3 billion industry.
- ➔ Revenues generated by service providing companies are estimated to increase 17% annually.

The Information and Communications Technology Council (ICTC) is pleased to present *Canada's Digital Imperative: Measuring Digital Platforms' Labour Market and Economic Impact* report. It demonstrates how the emergence and adoption of digital platforms such as Facebook, Twitter, Netflix, Instagram, and YouTube have created incremental economic opportunities. This includes employment creation, efficiency gain, cost reduction, revenue generation, collaboration, and innovation for Canadian enterprises in all sectors of the economy.

Digital platforms are broader than just social media. They include any platform that enables sharing one-to-many (for instance Netflix), or many-to-many (for instance YouTube or WebEx). For this study, therefore, ICTC has adopted a broad definition of digital platforms that includes social media such as Twitter, Facebook, LinkedIn, or Reddit; dynamic platforms featuring user-generated content such as YouTube or iTunes; meeting applications such as WebEx, FuzeBox, or GoToMeeting; curated content sources such as Slideshare or Pinterest; digital applications such as Instagram, and more.

Digital platforms have overcome many previous limitations on sharing, communicating, disseminating, and broadcasting digital content. These platforms offer new channels and avenues for businesses to reach clients. They provide visibility and relevance to enterprises, and are driving constant change in business practices in Canada and around the world. As an example, Canada's federal cabinet changes in summer 2013 were communicated to Canadians directly using [digital platforms](#) (e.g. Twitter).

This study explores:

- ➔ total employment created by the emergence and adoption of digital platforms, from both user and service provider perspectives;
- ➔ individual- and firm-level impacts of digital platforms adoption;



- ➔ contribution to GDP by the Canadian digital platforms ecosystem;
- ➔ projected employment and revenue growth in the digital platforms segment;
- ➔ challenges to greater service provision and enterprise adoption;
- ➔ support and encouragement needed to ensure that Canadian service providers flourish and consolidate their position on the global stage; and,
- ➔ proposed stakeholder group strategies with respect to adoption, service provision, talent, skills, financing, and policies.

### Study methodology

The information gathering and analysis framework for this study includes: primary data on digital platforms adoption and service provision gathered by Vision Critical on behalf of ICTC between April and August of 2013 through one-on-one interviews with industry leaders (e.g. CEOs, CTOs) from nearly 300 digital platforms service providers and adopters across a diverse array of sectors. Original research is supported by a literature review and secondary data collection and analysis. 35 key informant interviews with industry and subject matter experts provide a clear window into opportunities, challenges, and strategies to augment the benefits gained from adoption. ICTC considers that this analysis is unique in its offerings, as it provides in-depth research for the first time with respect to adoption and service provision of digital platforms in Canadian enterprises.

### Key findings

#### Many jobs are being created

ICTC estimates that 79,000 Canadians are employed as a result of the emergence and wide adoption of digital platforms. 11,000 of these jobs are in companies that are providing digital platforms services, while the other 68,000 jobs are in enterprises utilizing these platforms for business practices. Of these 68,000 jobs, 74% (50,000) are

full-time, 16% (11,000) are part-time, and 10% (7,000) are temporary such as intern or co-op positions. The geographic composition of the total employment – including service providers and users of digital platforms – is as follows: Ontario (34,000), Quebec (18,000), British Columbia (12,000), Alberta (8,000), the Atlantic region (4,000), and Saskatchewan and Manitoba (3,000).

#### Job creation prospects encouraging

ICTC estimates that up to 22,000 new digital platforms jobs will be created for occupations including software designers and engineers, network engineers, social media strategists, and data architects by 2018. The total employment in the digital platforms segment will exceed 101,000 as a result. This will occur as new and improved digital platforms continue to be developed and widely adopted by enterprises.

#### Contributing significantly to the economy

The Canadian digital platforms ecosystem currently contributes approximately \$7.3 billion annually to Canadian GDP, estimated to reach \$14.8 billion by 2018.

#### Wide and varied utilization of digital platforms

Digital platforms have helped stimulate consumer appetite for mobile technologies, and are profoundly altering consumer behaviour. Nearly 18 million Canadians use smartphones and most of these users access digital platforms on their mobile devices.

Digital platforms are making Canadian enterprises more agile, helping them gain efficiencies in their business processes. Enterprises can efficiently share, communicate, disseminate, and broadcast digital content. ICTC's original research shows that:

- ➔ 75% of Canadian businesses employ at least one segment of digital platforms for sharing, communicating, disseminating, and broadcasting purposes.



- ➔ 43% of Canadian enterprises employ multiple segments of digital platforms for business practices.
- ➔ 46% of all Canadian businesses use social media platforms such as LinkedIn, Twitter, Reddit, or Facebook.
- ➔ 28% of Canadian businesses employ dynamic platforms featuring user-generated content such as YouTube or iTunes.
- ➔ 16% of Canadian enterprises use meeting applications such as FuzeBox, WebEx or GoToMeeting.
- ➔ 9% of Canadian enterprises utilize user-generated content sources such as Slideshare or Pinterest, while 5% of Canadian businesses use digital applications such as Instagram.

#### Adoption not uniform across provinces

Adoption and use of digital platforms across the provinces varies. 71% of enterprises in the Atlantic region utilize digital platforms for business purposes; the corresponding ratio is 78% in British Columbia.

#### Helps gain efficiency and cost reduction

ICTC finds that businesses that adopt and employ digital platforms enhance efficiencies and establish sustainable competitive advantage. This is of particular importance since 49% of Canadian employers cite financial constraints as one of their key business challenges.

One in two (48%) Canadian businesses report achieving reduction in operating costs from digital platforms adoption. Among enterprises that are experiencing costs reduction, 35% report to have reduced operating costs by up to 3%; 19% report a reduction between 4% and 6%; while 38% report savings of 10% or more.

ICTC's findings show that one in two (50%) Canadian businesses have significantly improved customer service and satisfaction as a result of digital platforms adoption. The other 50%

respondents report none to some improvements in this regard.

Based on our consultation with enterprises, it is estimated that revenues increase by 7% on average as a result of digital platforms adoption.

#### Canadian service providers gaining momentum

Of the \$7.3 billion that Canadian digital platforms ecosystem presently contributes to GDP, Canadian service providers contribute \$1.3 billion. Revenues generated by service providers are estimated to increase 17% annually. For the majority of Canadian service providers, digital platforms are not their exclusive business focus. On average, revenues from digital platform streams constitute a quarter (24%) of their total revenues. Among Canadian service providers:

- ➔ 62% develop application software for digital platforms.
- ➔ 23% develop programming software or tools such as compilers, debuggers etc. for digital platforms.
- ➔ 21% provide supporting products or services to digital platforms.
- ➔ 13% develop applications that allow for public sharing of digital content.
- ➔ 37% develop multiple applications, tools, or supporting services for digital platforms.

#### From measuring to growing

There is a key role to be played by adopters, service providers, educators, and policymakers in ensuring that digital platforms support Canadian prosperity. This original research study delves into the actions that will benefit all stakeholders.

Suggested measures and strategies for **adopters** include:

- ➔ adopt digital platforms by businesses in all sectors.



- ➔ have awareness of options and optimize use of technological innovations for ease of use and reduction in costs.
- ➔ manage clients' expectations in terms of speed, accountability, transparency, and improved delivery of services.
- ➔ improve employee capacities to function in a connected and digital workplace.

Suggested measures and strategies for **service providers** include:

- ➔ continued provision of traditional services to enterprises that lack resources or willingness to adopt digital platforms.
- ➔ raise awareness of benefits to encourage wider adoption.
- ➔ understand the needs of all users and make their offerings relevant and easy to use.
- ➔ recognize foreign talent to address the skills shortage and improve understanding of the highly competitive global market.

Suggested measures and strategies for **academic institutions** include:

- ➔ modify curricula to address industry needs and offer integrated, hybrid programs in a timely manner.
- ➔ develop new partnership models.

Suggested measures and strategies for **policymakers** include:

- ➔ offer incentives such as tax holidays, credits, or competitive corporate tax rates to ease resource constraints and provide means to adopt digital platforms. This will enable job creation and contribute to Canada's Economic Action Plan.
- ➔ promote adoption among businesses and provide marketing support to service providers.

- ➔ ensure SMEs and start-ups can adequately fund their activities. Implement initial protection aimed at start-ups.
- ➔ support programs targeting youth at a younger age and encourage enrolment in STEM programs.

All stakeholders need to act in concert and without delay for Canada's economy to prosper. While we consider that this report offers much needed clarity regarding digital platforms, further work remains, particularly to study the labour market and economic impact of employing digital platforms in sector- and province-specific contexts.

ICTC's sub-sector studies continue to demonstrate their value as a lens for critical and constructive thinking about some of the most fundamental opportunities and challenges in these spheres. We are confident that this *Canada's Digital Imperative: Measuring Digital Platforms' Labour Market and Economic Impact* study will add further significance to that. We invite readers to engage with us to strategize on concrete actions that will benefit all stakeholders to achieve new opportunities.

## 1. INTRODUCTION

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### Section snapshot

- ➔ ICTC conducted a survey of nearly 300 enterprises to find out what opportunities have been created for incremental opportunities as a result of the emergence and adoption of digital platforms such as YouTube and Facebook.
- ➔ 35 key informant interviews with employers and subject matter experts provided a clear window into opportunities, challenges, and strategies related to augmenting the benefits gained from adoption.
- ➔ This report sheds light on the labour market and economic impact of the emergence and adoption of digital platforms, from both service provider and user perspectives.
- ➔ It also highlights the growth potential of the service providers and estimated job creation in the digital platform segment as a result of increased adoption and upcoming new platforms; challenges to greater service provision and enterprise adoption; support and encouragement required to ensure that the Canadian service providers flourish and consolidate their position on the global stage; and implications for policymakers with respect to adoption, service provision, talent, skills, financing, and communications regulation.

Digital platforms have led to a drastic transformation in the creation, consumption, and delivery of digital content, mainly through web-based services available on all digital devices. These platforms allow consumers to proactively participate in producing and consuming content, and in near-real-time at that. Digital platforms have enabled one-to-many and many-to-many sharing, communicating, disseminating, and broadcasting of digital content. They have opened effective and bi-directional communications channels between content creators and target audiences to efficiently share content at only a fraction of previous costs. Digital platforms allow enterprises to upgrade existing business practices, workplaces, and operational procedures.

Digital platforms include more than social media. For this study, ICTC has adopted a broad definition of digital platforms that includes social media such as Twitter, Facebook, LinkedIn, or Reddit; dynamic platforms featuring user-generated content such as YouTube or iTunes; meeting applications such as WebEx, FuzeBox, or GoToMeeting; curated user-generated content sources such as Slideshare or Pinterest; digital applications such as Instagram, and more.

Digital platforms are increasingly providing enterprises with greater connectivity, resulting in profound changes in the way they do business and create and deliver digital content. Small service providers, leveraging ubiquitous mobile and fixed broadband networks, are overcoming the challenge of capital expenditure to expand business, reduce costs, and reach clients. Economies of scale are a magnitude smaller, while more successful. Digital platforms are creating immense opportunities in every sphere of economic activity, and Canadian enterprises are adopting these platforms in large numbers in response. This, in turn, has resulted in an increased contribution to Canada's GDP through increased employment across all sectors of the economy, as well as several small- and medium-sized enterprises establishing themselves as valued digital platforms service providers.



Digital platforms are gateways designed to provide access to digital content in a networked environment that differs greatly from traditional linear models. Along with mobile technologies and cloud services, digital platforms are transforming entire value chains. For instance, the distribution of content in digital form such as music, video, software, books, or news has significantly altered resource requirements and value chains in these industries.

Digital platforms are leading to the rise of new business practices and creating opportunities for the enhancement of digital marketing strategies. Enterprises in every sector of the economy are embracing these platforms to offer product (content) and services responsive to customer demand. Although the entertainment industry led the way with availability and utilization of digital platforms that can be accessed by consumers with such popular platforms as Facebook, Twitter, YouTube, and Netflix, constant developments are helping enterprises adopt digital platforms that fit their requirements.

Sectors such as health, education, finance, and retail, among others, are shifting their distribution channels to move products and in doing so are co-creating values. Digital platforms in the healthcare sector are able to provide quick access to expert care even in remote and rural communities by accessing cloud based services storing zeta-bytes of data. For instance, TELUS' health initiatives are helping Canadians take an active role in living healthier lifestyles by promoting Canada's first consumer e-health service that puts Canadians in control of their health information. The service can serve as the foundation for building new models of healthcare in Canada, one in which the citizens will have access to their personal health information along with a variety of tools for health and wellbeing, chronic disease management, paediatric care, and more. Using such platforms will help address the current shortage of experienced medical personnel in Canada and the associated increased wait-times patients face.

Digital platforms reduce distribution costs considerably and have a large impact on profitability and economic growth, and the findings of this study emphasize as much.

Companies that lay solid foundations and adopt digital platforms judiciously will be in a strong position to increase efficiency and establish sustainable competitive advantage. A body of evidence to conclusively support this hypothesis was previously lacking. This study bridges that gap. The lack of data with respect to digital platforms adoption by enterprises – and the resulting lack of estimates of the economic impact of that adoption – make it difficult for policymakers to design responsive strategies. Due to a lack of understanding of the benefits derived from adoption, many Canadian enterprises have yet to fully employ and utilize digital platforms. Although adoption mechanisms or return on investment is not uniform across all economic sectors, there is no doubt that by investing in innovation and adopting innovative technologies, Canadian businesses across the industrial spectrum can improve efficiency and reach.

This study finds that Canadian businesses with the foresight to realize that the business environment and models will change even more drastically before the end of 2010s are making innovation central to their business strategies. Enterprises realize that the investments they make in adoption digital platform adoption will help secure their future success. Canada's future competitiveness will depend on a workforce and workplaces that are universally equipped to take advantage of emerging innovations.

Digital platforms have helped stimulate consumer appetite for mobile technologies – making mobile devices the most rapidly adopted technology in history and the most popular and widespread personal technology in the world (ITU, 2009) – and thus are profoundly altering consumer behaviour. For businesses, the restructuring of business practices to take advantage of Internet to drive efficiencies in the previous decade is reoccurring as digital platforms – alongside mobile technologies and cloud services – drive a new cycle of innovation (ICTC, 2013; Bertschek, Cerquera and Klein, 2011; Forman and van Zeebroeck, 2010; Spezia, 2011). The impact is discernible in the rapid growth of businesses and jobs in Canada and worldwide (ICTC, 2012).

The social media platform Facebook is estimated to have added 235,000 jobs to the U.S. economy,



contributing \$15.7 billion annually (Center for Digital Innovation, Technology and Strategy, 2011). Facebook supports 232,000 jobs in the 27 European Union member states and contributes 15.3 billion Euros in GDP (Deloitte, 2012).

Newer platforms will emerge to respond to the varying needs of the market and accelerate making digital platforms even more compelling. Canadian businesses are compelled – more so in today’s ultra-competitive and uncertain economic environment than at other times – to achieve cost reduction through greater efficiencies without reducing services. They need to understand and maximize the power of digital platforms and to provide communications channels to employees and clients. Other important factors that businesses need to be cognizant of include how to make the potential benefits of adoption sustainable, how to foster innovation in terms of service delivery, how to utilize the service offerings of digital platforms service providers and how to remain flexible to meet future transformations in these technologies.

Great opportunities often go hand-in-hand with significant challenges. Challenges for businesses with respect to adoption of digital platforms include resource constraints; talent and skills mismatch; difficulty related to content generation; financing and policy-related challenges; unmeasured benefits or limited value of adoption; availability of too many platforms and selecting the right ones. These issues will have to be addressed to make the most of new opportunities.

### The research agenda

The benefits or return on investment of digital platforms adoption is challenging to measure and largely unavailable to date. With that in mind, this study explores:

- ➔ total employment created by the emergence and adoption of digital platforms, from both user and service provider perspectives;
- ➔ individual- and firm-level impacts of digital platforms adoption;

- ➔ contribution to GDP by the Canadian digital platforms ecosystem;
- ➔ projected employment and revenue growth in the digital platforms segment;
- ➔ challenges to greater service provision and enterprise adoption;
- ➔ support and encouragement required to ensure that the Canadian service providers flourish and consolidate their position on the global stage; and
- ➔ various stakeholder group strategies with respect to adoption, service provision, talent, skills, financing, and policies.

### Report structure

Within this research scope, this study begins in section 2 with a brief overview of its approach and methodology. Section 3 explores the labour market impact of digital platforms, while their economic impact is detailed in section 4. How the Canadian digital platforms service providers are faring with respect to products and services, revenue generation, and job creation is discussed in section 5. Section 6 outlines various issues and challenges of which Canadian businesses need to be aware. What the future holds for innovations in digital platforms is discussed in section 7. In a final section of the paper, the findings of this study are summarized in the context of a discussion about strategies to stimulate the Canadian economy with increased service provision and adoption of digital platforms.

## 2. METHODOLOGY

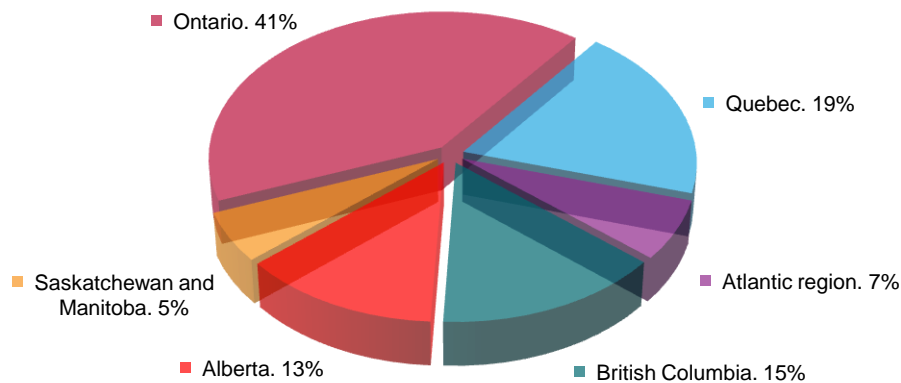
This study began with conducting a **review of the existing literature** to establish definitions, research gaps, and study scope. A best-efforts list of thought leaders engaged in the Canadian digital platforms ecosystem was established from desktop research as well as from ICTC's network.

These thought leaders participated actively in **key informant interviews** and provided important insights that are used to finalize the user survey and service provider survey instruments and methodologies for primary data collection. 35 key informant interviews with employers and subject matter experts provided a clear window into

opportunities, challenges, and strategies related to augment the benefits gained from adoption. These discussions also inform our analysis.

Primary data regarding the impact of digital platforms is gathered through **two targeted surveys** by Vision Critical conducted on behalf of ICTC between April and August of 2013 through one-on-one interviews with industry experts in leadership positions such as CEOs, CIOs, CTOs, CFOs, heads of IT, directors of operations, executive directors, and presidents of companies. The following graph exhibits the geographic composition of the survey participants (figure 1):

Figure 1. Survey participants by province



Source: ICTC digital platforms survey, 2013

The labour market and economic impact of digital platforms adoption and service provision is estimated through aggregation of the survey findings with appropriate weight (business counts) applied.

ICTC will continue to disseminate these findings among stakeholders through webinars and other relevant channels to ensure changing realities are reflected in planning for future developments.

### 3. THE LABOUR MARKET IMPACT

#### Section snapshot

- ➔ ICTC estimates that 79,000 Canadians are employed as a result of the emergence and wide adoption of digital platforms.
- ➔ 68,000 of these jobs are in enterprises utilizing these platforms for sharing, communicating, disseminating, and broadcasting digital content, and thus gaining efficiencies.
- ➔ Of the 68,000 jobs in the digital platforms user industry, 50,000 (74%) are full-time, 11,000 (16%) are part-time, and 7,000 (10%) are temporary such as intern or co-op positions.
- ➔ Up to 22,000 new digital platforms jobs are expected to be created between now and 2018. The total employment in the digital platforms segment will exceed 101,000 as a result.
- ➔ The geographic composition of the total employment—including service providers and users of digital platforms—is as follows: Ontario (34,000), Quebec (18,000), British Columbia (12,000), Alberta (8,000), the Atlantic region (4,000), and Saskatchewan and Manitoba (3,000).
- ➔ As roles, responsibilities, work areas, and sectors get more intertwined, many occupations will be directly or indirectly linked with digital platforms.

Digital platforms are having a significant impact on the Canadian labour market. They are providing new opportunities for technical ICT professionals to apply their skills in a connected environment. More importantly, the wide reach and utilization of digital platforms by businesses is creating significant employment opportunities for non-technical professionals, redefining some and creating many new jobs, and contributing significantly to the Canadian economy.

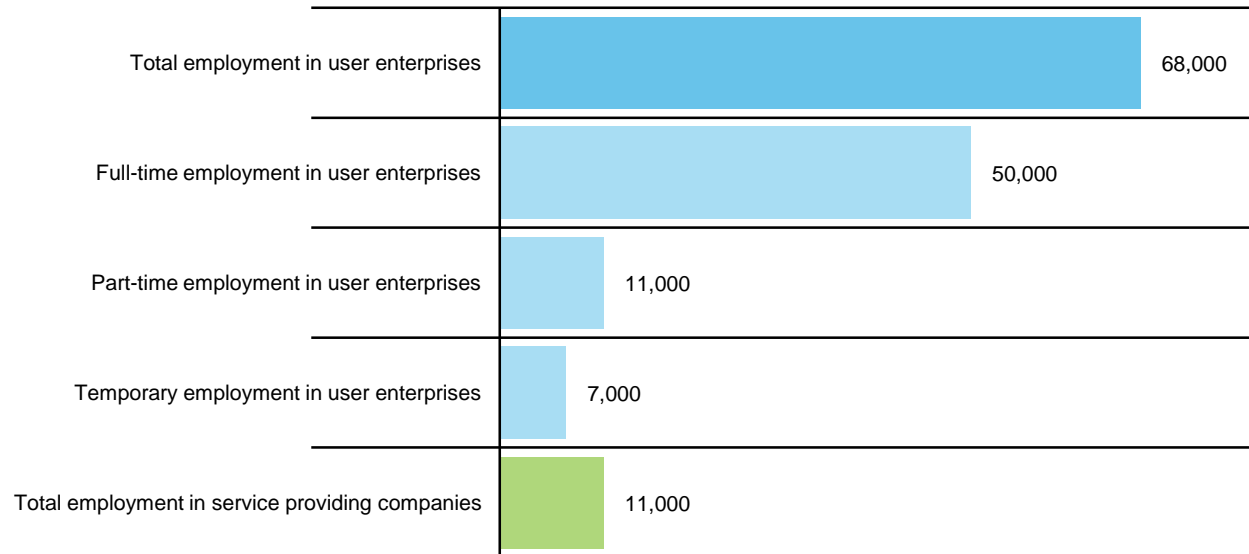
Jobs in digital platforms cover a wide range of opportunities and, as these jobs are gaining prominence, measuring the scope and contribution of these occupations is vital. The digital platforms labour market includes positions in small start-up companies, in growing small- and medium-sized enterprises (SMEs), and in large corporations.

Non-technical positions range from social media coordinators to web content specialists to digital marketing managers. Technical positions range from software programmers to multimedia product specialists to mobile-enabled web developers.

An estimated 79,000 Canadians are employed as a result of the emergence and wide adoption of digital platforms. 11,000 of these jobs are companies that are providing digital platforms services, while the other 68,000 jobs are in enterprises that are utilizing digital platforms (figure 2). Of the 68,000 jobs in the digital platform user industry, 50,000 (74%) are full-time, 11,000 (16%) are part-time, and 7,000 (10%) are temporary such as intern or co-op positions.

This study measures the direct labour market impact of digital platforms. Hence induced jobs have not been taken into account in this estimate.

**Figure 2. Digital platforms induced direct employment in Canada**

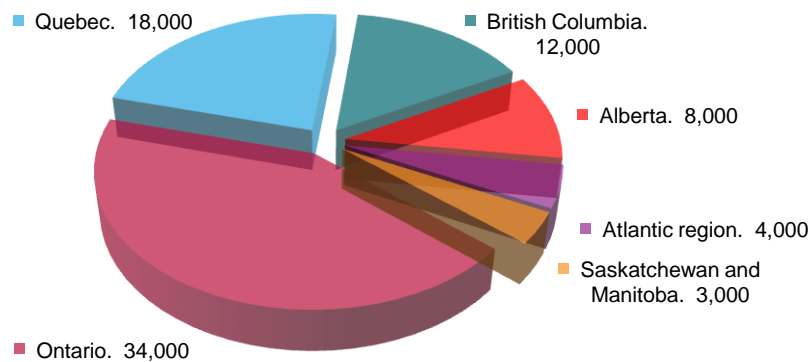


Source: ICTC, 2013

The geographic composition of the total employment – including service providers and users of digital platforms – is as follows (figure 3): Ontario (34,000), Quebec (18,000), British

Columbia (12,000), Alberta (8,000), the Atlantic region (4,000), and Saskatchewan and Manitoba (3,000).

**Figure 3. Digital platforms induced direct employment by province/region**

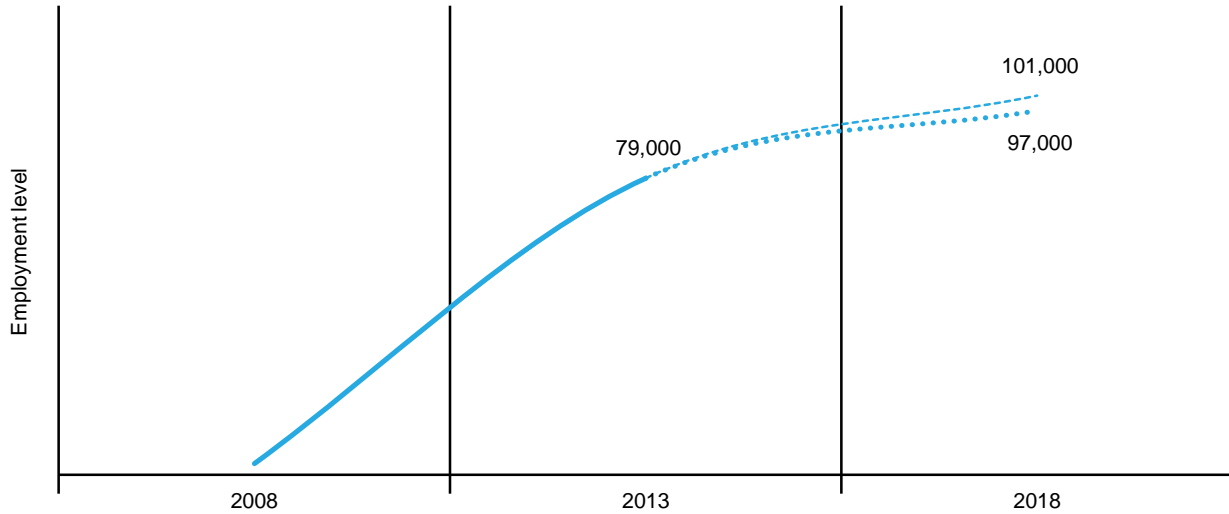


Source: ICTC, 2013

In the digital platform labour market, some occupations are invariably more critical than others and demand for such skills as software engineers/programmers and social media strategists will continue to rise in the medium term. When all technical and non-technical occupations

are taken into consideration, between 18,000 and 22,000 new jobs are expected to be created between now and 2018 as a result of wider enterprise adoption of digital platforms and creation of new and improved platforms (figure 4).

**Figure 4. Employment outlook for digital platforms induced employment**

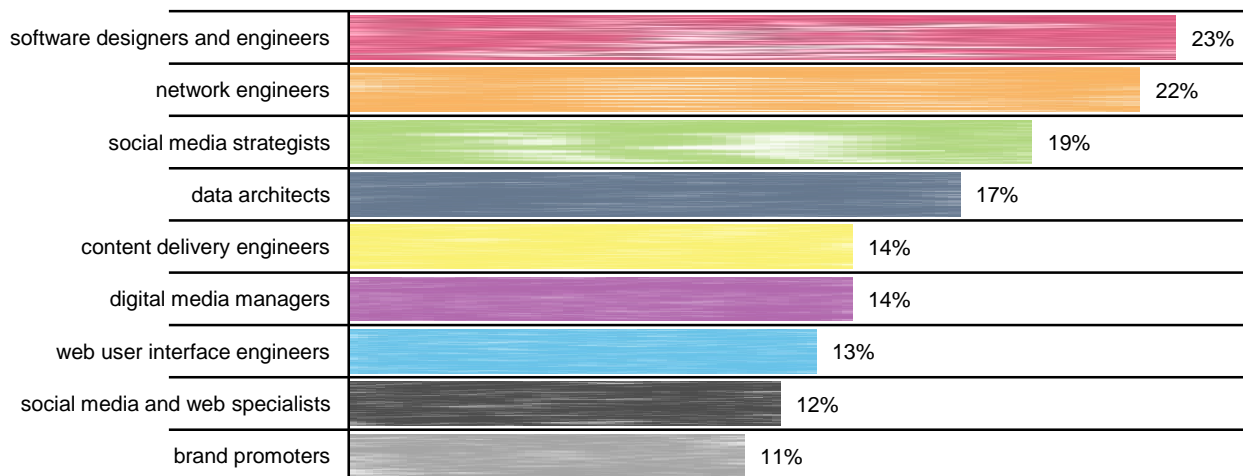


Source: ICTC, 2013

In the digital platform labour market, some occupations are invariably more critical than others – in both technical and non-technical domains – and demand for such jobs will continue to rise in

the medium term. The employment outlook for some of the most crucial occupations in digital platforms is outlined below (figure 5):

**Figure 5. Employment forecast for select digital platforms occupations**



Source: ICTC, 2013

As roles, responsibilities, work areas, and sectors become more intertwined, many occupations will be directly or indirectly linked with digital platforms.

#### 4. THE ECONOMIC IMPACT

##### Section snapshot

- ➔ ICTC estimates that Canadian digital platforms ecosystem presently contributes approximately \$7.3 billion annually to Canadian GDP, estimated to reach \$14.8 billion by 2018.
- ➔ Firm-level impacts of adoption of digital platforms include lower costs; improved efficiency and customer relationships; higher productivity, sales, and profits; improved mobility; faster and efficient market research and quality product development; real-time information and collaboration creating stronger innovation capacity; and proliferation of smart devices boosting adoption and creating new opportunities.
- ➔ Individual-level impacts include: large number of jobs created; higher productivity and improved mobility; higher wages for in-demand skills; and higher rates of labour force participation.
- ➔ 75% of Canadian businesses employ at least one segment of digital platforms for sharing, communicating, disseminating, and broadcasting purposes. 43% of Canadian enterprises employ multiple segments.
- ➔ Adoption and use of digital platforms across the provinces varies. 71% of enterprises in the Atlantic region utilize digital platforms for business purposes, while the corresponding ratio in British Columbia is 78%.

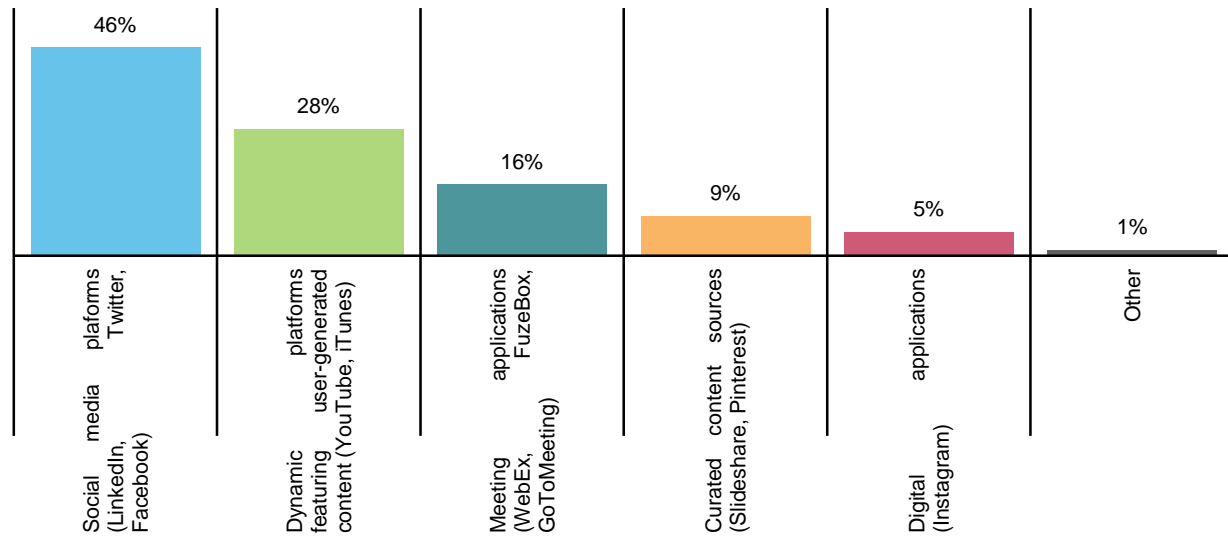
Digital platforms are a catalyst for profoundly altering consumer behaviour. Nearly 18 million Canadians use smartphones and most of these smartphone users access digital platforms on their mobile devices. The rapid adoption of smart devices demonstrates the value of digital content to society.

Enterprises are striving to effectively position themselves to benefit from this trend. Having intermittent access to clientele is profoundly insufficient in today's business environment. The amalgamation of digital platforms with mobile devices and various enabling applications is making it simpler for businesses to instantly communicate with customers, staff, and vendors.

Digital platforms are allowing agility for Canadian enterprises, helping them gain efficiencies in their business practices by efficiently sharing, communicating, disseminating, and broadcasting digital content. Not all enterprises, however, are utilizing these platforms to the fullest extent possible and as a result are not yet reaping many of the benefits (figure 6). ICTC's research shows that:

- ➔ 43% of Canadian enterprises employ multiple segments of digital platforms for business practices.
- ➔ 46% of all Canadian businesses use social media platforms such as LinkedIn, Twitter, Reddit, or Facebook.
- ➔ 28% of Canadian businesses employ dynamic platforms featuring user-generated content such as YouTube or iTunes.
- ➔ 16% of Canadian enterprises use meeting applications such as FuzeBox, WebEx or GoToMeeting.
- ➔ 9% of Canadian enterprises utilize curated content sources such as Slideshare or Pinterest, while 5% of Canadian businesses use digital applications such as Instagram.

**Figure 6: Enterprise usage of digital platforms in Canada**



Source: ICTC, 2013

Nationwide, three out of four (75%) Canadian businesses employ digital platforms for sharing, communicating, disseminating, and broadcasting purposes (figure 7). Adoption and use of digital

platforms across the provinces varies. 71% of enterprises in the Atlantic region utilize digital platforms for business purposes, while the corresponding ratio in British Columbia is 78%.

**Figure 7. Digital platforms adoption by province**



Source: ICTC, 2013



Digital platforms enterprise adoption is propelled by a number of factors such as technological advances, societal trends, availability, ease of use, low costs, and impact. Businesses need to take a strategic approach to increase adoption. If adoption facilitates increased revenue through awareness raising and responsive service delivery, efficient operations, and active client engagement, there is no reason not to adopt.

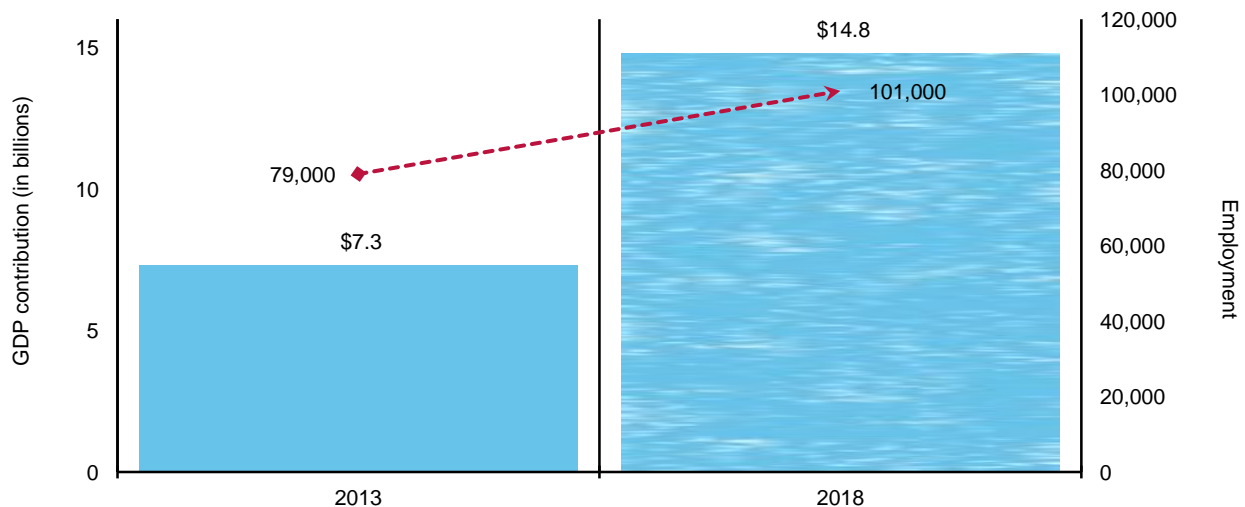
### Impact on GDP

The creation of 79,000 jobs as a result of the emergence of digital platforms, including 68,000 in

enterprises that are utilizing digital platforms and 11,000 in companies that are providing digital platform services, makes clear that the economic contribution of creation and increased adoption of digital platforms is sizable.

ICTC estimates that Canadian digital platforms ecosystem currently contributes approximately \$7.3 billion annually to Canadian GDP. Based on our analysis and consultation with digital platforms stakeholders, digital platforms are estimated to contribute up to \$14.8 billion annually to GDP by 2018 (figure 8). For a more detailed economic impact analysis, please refer to Appendix A.

Figure 8. Projected GDP contribution and employment by 2018



Source: ICTC, 2013

### Cost-effectiveness

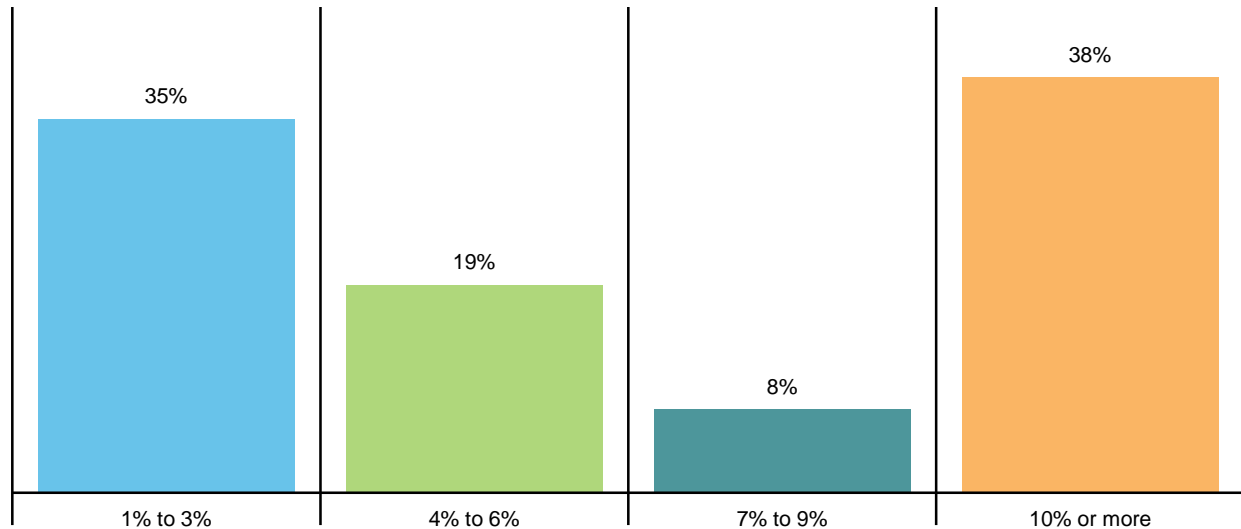
The advancement and continued refinement of digital platforms are allowing businesses to reduce costs and physical infrastructure requirements, and to increase their efficiency with increased profitability as a result. Digital platforms allow enterprises, particularly small- and medium-sized ones, to remain connected with clients, stay competitive through cost-effectiveness, and function smoothly. Competing in today's business climate means that businesses must find ways to increase efficiencies. The empowerment of workers with digital platforms is allowing

businesses to save on resources and to manage their businesses more proactively.

One in two (48%) Canadian businesses report achieving reduction in operating costs from digital platforms adoption (figure 9). Among them, 35% businesses report to have reduced operating costs by up to 3%, 19% businesses report to have reduced operating costs between 4% and 6%, while 38% businesses have reduced costs by 10% or more.



**Figure 9. Margin of costs reduction**



Source: ICTC, 2013

### Collaboration and real-time information

Advanced and real-time connectivity has opened channels for intra and inter discussions and collaboration amongst service providers and users, creating opportunities for innovation. Digital platforms have enabled personalization and enriched user experiences.

Real-time and location-based processes result in quick and easily accessible data and communications, information consistency, responsive case management and seamless information exchanges. Information and actions are being coordinated in any location and with business partners and clients, improving collaboration among stakeholders.

These platforms are making many products and services easy to use and supporting more flexible practices. They allow workers to keep in touch, be productive, and make use of company data, resources, forms, and business processes—regardless of distance, time, place and diverse natural conditions—using wireless networks through mobile and wireless devices. For example, digital platforms enable team meetings using the Internet to increase efficiencies and reduce costs. Workers no longer need to take meeting minutes

to transfer into the computer. These sessions can be recorded and transcribed automatically. Digital platforms offer welcome and productive relief from hours spent collecting and verifying mundane information.

With the kind of benefits digital platforms offer enterprises in terms of improved efficiencies, coordination, real-time communications, and performance management, it is only logical to employ all applicable segments of digital platforms for business purposes to bring greater efficiency and bottom-line results. One in four (26%) Canadian businesses report that they benefit significantly from faster access to real-time business-critical information flow as a result of digital platforms adoption.

### Mobility and productivity gain

In addition to providing continuous access to content, digital platforms provide mobility, a crucial enabler of the rapidly expanding ecosystem. The ease with which digital platforms can be accessed via a tethered or untethered device has helped boost their adoption significantly. Within three to five years, many existing limitations in spectrum



capacity, frequencies, network, bandwidth, device memory, processor, video resolution, battery life and data input will be eliminated. As devices and components become more sophisticated and miniature, new form factors will emerge to respond to the varying needs of the targeted consumer segments (e.g. iPad mini). As new devices continue to make their way into consumers' hands, the need to utilize digital platforms to reach a wider audience continues to grow.

With improved connectivity and mobility, enterprises increase efficiency, lower costs, and thus increase productivity to ultimately realize greater profitability. Digital platforms facilitate the Canadian workforce to work smarter and utilize time more efficiently. A majority of Canadian workers are already mobile – doing work related activities using mobile technologies. Easy access to digital platforms plays a major role in empowering workers to remain productive, regardless of their location. Digital platforms, in conjunction with mobile technologies, enable workers to effectively manage their time completing business-related activities, compared to workers that lack access to these technologies.

As new and improved platforms emerge and Canadian employers put the necessary mechanisms in place for universal digital platforms adoption, the benefit to the overall economy will increase manifold. Given that workers are doing work-related activities (e.g. correspond with clients via social media) outside of business hours, much of this significant contribution may remain unrecognized and unreported, but that does not diminish its size or significance.

Digital platforms play an active role in improving utilization of resources and incenting eco-friendly business practices. People connect virtually from remote locations rather than traveling, substituting transportation for mobility and reducing their carbon footprint. This also helps ensure business continuity, for instance amid severe weather conditions. One in four (24%) Canadian businesses report an improvement in their utilization of resources as a result of digital platforms adoption.

#### **Proliferation of smart devices boosts adoption**

Within a relatively small period, technologies have enabled the digital content marketplace to grow substantially. This organic growth has helped in the rapid proliferation and adoption of devices and platforms. While platforms are accessed through websites and applications on personal computers, tablets, and smartphones, there are other options available to access content, especially in the arts and entertainment segment. Set-top-boxes, digital media receivers, smart TVs, and gaming consoles are some of devices that help integrate a multitude of platforms such as Netflix, YouTube, Facebook, or Twitter into one.

Set-top-boxes are a good example of how digital platforms, in conjunction with devices, are enabling various emerging technologies to become interconnected and intertwined. These boxes convert traditional analog signals to digital and have improved delivery of content, while simultaneously reducing costs. These devices have also helped transform regular televisions into smart TVs with capabilities to connect to the Internet. This also feeds a growing ecosystem of apps. In addition, by providing storage space through cloud services, they have simplified the process of accessing and storing digital content. They also provide additional functionalities such as accessing Netflix, YouTube, Facebook, and other platforms, set-top-boxes act as a one-stop-shop to digital content that can easily be accessed at the click of a button.

Similarly, smart TVs enable access to content directly from the TV. They also provide the same benefits as set-top-boxes and allow using other digital platforms. Some newer TVs even support Mobile High-Definition Link (MHL) ports, to directly connect cellular phones and other portable consumer electronics to the TV for a mobile audio/video interface. It supports 1080p HD video and digital audio while simultaneously charging the connected device. With 3G and 4G subscription and penetration on the rise, adoption of smart TVs will rise in the coming years. Nearly 20% of all TVs shipped worldwide in 2013 were smart TVs (NPD group, 2012). Unit production of flat-panel smart TVs will grow from 69 million worldwide in 2012 to 198 million in 2016, when 85% of all flat-panel TVs will be smart TVs (Gartner, 2012).

Gaming consoles are also quickly becoming a significant source of delivering digital content to consumers. Through platforms such as Xbox Live and PlayStation 3, consoles are able to provide access to multiple platforms, acting as media extenders.

An increase in the use of these connected devices that allow one-stop accessibility to a multitude of digital platforms will further encourage content consumption, creating employment and economic opportunities in the economy.

**Faster and efficient market research and product development**

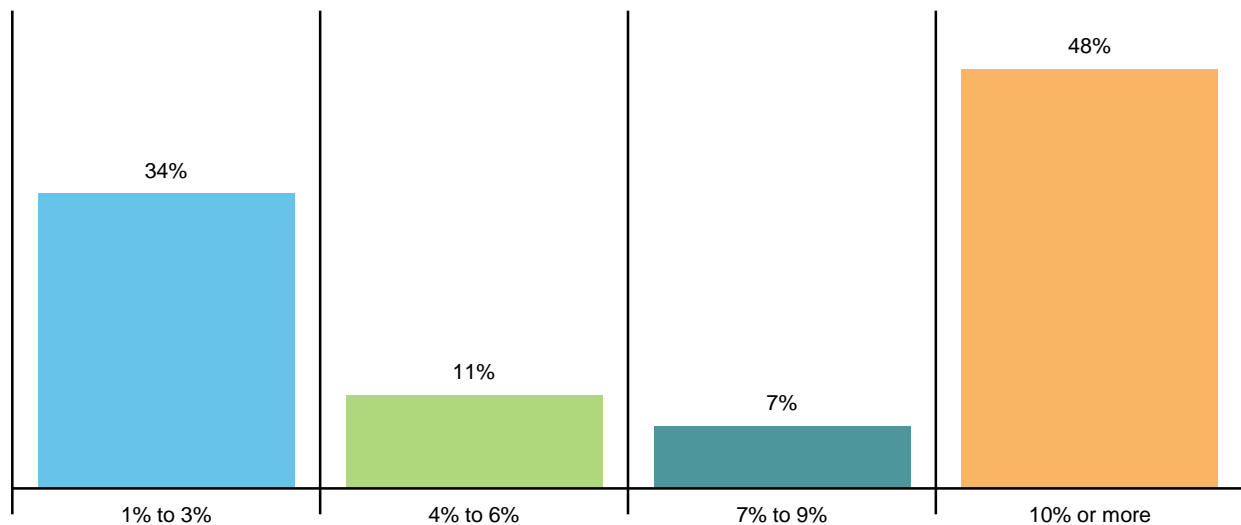
Digital platforms enable business expansion through more accurate product or service demand projections and customer outreach, streamlined and more accessible information flow, lower start-up and operating costs for enterprises, and real-time, flexible communications and transactions with clients. The interactivity allowed by digital platforms is allowing enterprises to share information and get immediate feedback from clients on content and services. This accessibility is reducing time required for market research and

leading to faster research and development for companies, enabling them to stay competitive. Reduced time lag in multiple phases has led to product upgrades moving at a faster rate, increasing client satisfaction and loyalty.

Digital platforms have introduced a new dimension into advertising and marketing for Canadian enterprises. Existing and potential clients get exposure to advertisements on digital platforms through a wide variety of innovative marketing technologies including banner ads, apps, quick response (QR) codes, interactive voice response (IVR) messaging, and more. Using big data analytics, these advertisements can be customized to individual taste and preference. This allows more effective marketing strategies and outcomes.

As the total smartphone user base in Canada approaches 18 million, advertisement revenues will continue to experience strong growth. Three out of four (75%) Canadian businesses employ digital platforms and mobile technologies for marketing purposes. It is estimated that company revenues increase by 7% on average as a result of adoption and strategic use of digital platforms (figure 10).

**Figure 10. Increase in revenue through digital platforms adoption**



Source: ICTC, 2013



## Improved customer relationships and efficiency

Digital platforms allow businesses to have an unprecedented level of connectivity between customers, vendors, and employees that are all essentially connected with each other through these platforms. Digital platforms enable connectivity in the one-to-many and many-to-many domains. These platforms are leading to products and services being offered to customers in new ways. They are providing consumers a way to connect and collaborate in online communities, a launching pad for new ideas, while implicitly assisting in the development of today's essential digital skills. As a result, they make enterprises more efficient, more creative and, thus, more valuable to clients. Digital platforms enable enterprises to maintain customer rapport and information in real-time. Situations and needs are better managed as they occur. Real-time information improves responsiveness and knowledge-based decision making. The modern

consumer increasingly demands personalized services. They are empowered through digital platforms to communicate interactively. This results in improved customer satisfaction levels and streamlines business processes, responsiveness, and resource requirements. Businesses can stay current on client opinion and priorities. Digital platforms have eliminated communication barriers and provided flexibility and options to customize social interaction of people with similar interests. Extended outreach also expands corporate accountability and transparency to stakeholders and empowers greater client participation in strategic decision making. Enterprises are turning to digital platforms for responsive service delivery, operational efficiencies, and active client engagement.

One in two (50%) Canadian businesses report to have significantly improved customer service and satisfaction as a result of digital platforms adoption, while the other respondents reported none to some improvements in this regard.

## 5. CANADIAN DIGITAL PLATFORMS SERVICE PROVIDERS

### Section snapshot

- ➔ ICTC conducted a survey of over 100 digital platforms service providers to find out about their opportunities and challenges.
- ➔ 62% of Canadian service providers develop application software for digital platforms.
- ➔ 23% of them develop programming software or tools such as compilers, debuggers etc. for digital platforms.
- ➔ 21% provide supporting products or services to digital platforms.
- ➔ 13% develop digital platforms that incorporate applications that allow for public sharing of digital content.
- ➔ 37% of Canadian service providers develop multiple applications, tools, or supporting products and services for digital platforms.
- ➔ Revenues from advertising constitute 15% of the digital platforms revenue.
- ➔ On average, revenues from digital platforms stream constitute 24% of service providers' total revenues.
- ➔ Canadian service providers expect their digital platforms revenues to increase 17% annually on average.

In addition to creating jobs for many Canadians, digital platforms have encouraged many Canadian entrepreneurs to participate in this sphere and create innovative platforms from which adopters can benefit, vie with established service providers on an equal footing, challenge legacy systems, and create awareness of their innovative platforms.

Undoubtedly, linking emerging technologies and platforms has enabled the formation of a new environment – giving rise to new marketplaces. This has facilitated exchange of resources, information, and value with much ease. Other benefits of these platforms include the following:

- 1) Integrating social media intelligence into platforms delivers an insight into what customer requirements are, thereby providing platform developers with ideas that would cater to a wider audience.
- 2) Ideas can also be leveraged via means of online communities or through crowdsourcing channels, giving a better understanding of a given topic. Through the use of digital technologies, individuals are able to easily network regardless of their location to accomplish a task.

These technological developments have levelled the playing field for small and medium sized enterprises to compete with large companies. The emergence and wide adoption of social media has equalized the advantage that large companies traditionally enjoyed. Due to their size and scope of operations, large-scale companies could easily raise product awareness via advertising, marketing mechanisms, enabling them to acquire more clients. SMEs' limited funds in past restricted this growth, until the emergence of social media platforms. Leveraging this benefit of social media SME's can compete directly with large companies and acquire their share of the clients without requiring massive marketing budgets. Not only can they expand operations globally with ease, but they can also target specific customers.

During a time of fiscal austerity, these platforms have enabled enterprises to establish operations in their respective industries. They have added jobs to the Canadian economy while contributing positively to economic growth. Constant improvements in hardware and software network capabilities have facilitated the widespread adoption of these platforms amongst consumers. In some sectors such as arts and entertainment, many have opted to add such services on top of existing ones, for example, consumers have opted to sign up for over-the-top (OTT) services such as Netflix in addition to cable services.

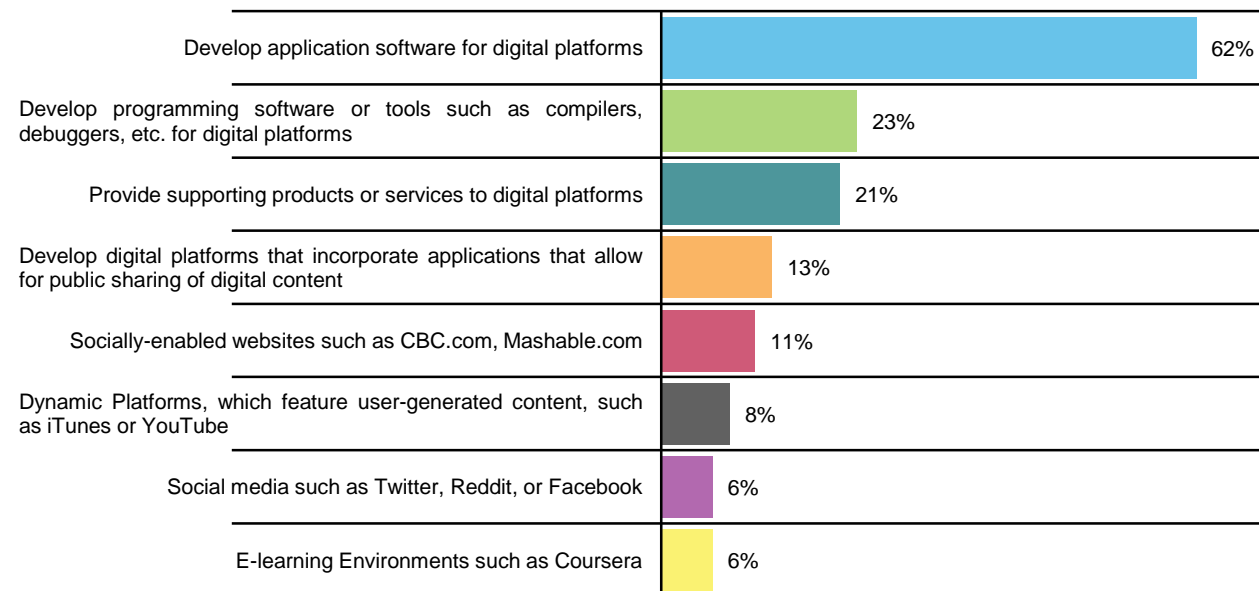
In a relatively short period, adoption in other sectors is encouraging the development of a new ecosystem incorporating cloud services and social media, giving rise to new connections that have resulted in creating important alternatives to traditional and technology-specific distribution channels, while simultaneously becoming key contributors to Canada's GDP.

ICTC conducted a survey of over 100 digital platforms service provider enterprises to find out

about the various avenues of revenue generation and the total revenue generated by the Canadian digital platforms sub-sector, its growth potential, and estimated job creation in this segment as a result of the growing adoption rate of these platforms (figure 11). ICTC's original research shows that:

- ➔ 62% of Canadian service providers develop application software for digital platforms.
- ➔ 23% of them develop programming software or tools such as compilers, debuggers etc. for digital platforms.
- ➔ 21% provide supporting products or services to digital platforms.
- ➔ 13% develop digital platforms that incorporate applications that allow for public sharing of digital content.
- ➔ 37% of Canadian service providers develop multiple applications, tools, or supporting products and services for digital platforms.

**Figure 11. Digital platforms offerings by Canadian service providers**

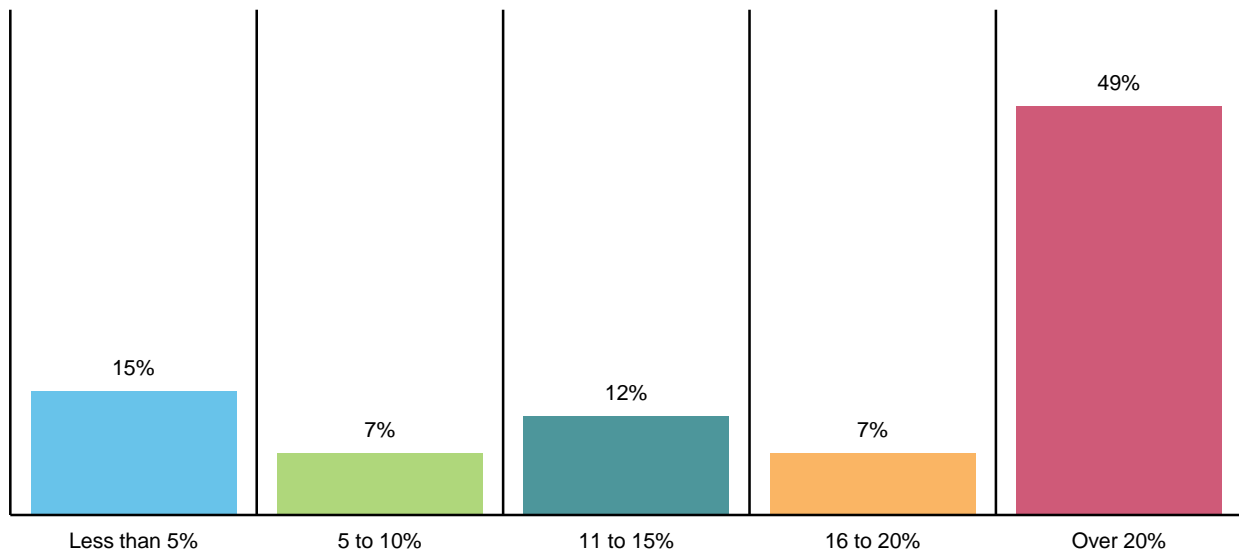


Source: ICTC, 2013

During the consultation phase of this study, ICTC met with service providers ranging from one that just released its first digital platform product to one that created many. Revenues from advertising constitute 15% of the digital platforms revenue. Digital platforms, however, are not the exclusive

business focus of most Canadian service providers yet. On average, revenues from digital platforms stream constitute 24% of their total revenues. Canadian service providers are expecting their digital platforms revenues to increase 17% annually on average (figure 12).

Figure 12. Expected increase in revenue for Canadian service providers



Source: ICTC, 2013

### Canadian digital platforms

For instance, Toronto-based **500 pixels** has brought together aspiring and professional photographers from all over the world under its dynamic platform **500px** featuring user-generated content that lets users discover, share, buy, and sell inspiring photos. Promoting their services through social media digital platforms such as Facebook and Twitter, they have managed to expand the client base significantly since its inception. The simple platform interface not only allows users to share their work, but also offers learning opportunities from professionals in the community, while providing an avenue to earn money. Users are also able to follow their fellow photographers and comment on their snaps. This platform also has an app that can be accessed via several devices including iPhone, iPad, Android,

and Chrome OS. A plug-in option also allows users to edit, to organize, and to upload the photo or a collection of photos to **500px**. Enthusiasts are able to sign up using their social media such as Facebook, Twitter, and Klout accounts or via email. Revenues are generated both through an annual subscription fee that allows photographers to upload unlimited prints and through sales of apps and digital prints.

Elsewhere, a platform called **Zik**, developed by a Montreal-based service provider, delivers quick access to music with excellent sound quality to its customers for a monthly fee. Containing the largest selection of French-language music library in North America, **Zik** focuses on promoting local artists. By providing access to millions of songs, **Zik** provides the option of creating ones' own personal music library accessible when and where required without actually owning the content.



Existing infrastructure helps stream music either to a personal computer or on a mobile device. The platform contains the equivalent of 68 years of continuous music and allows subscribers to follow their favourite artists and post their findings on social networks, while letting them customize playlists. The platform intends to bring Quebec's artists and culture to prominence by charging a monthly fee to access content on tethered devices and a marginally higher fee to access it on wireless devices.

In the health care industry, Toronto based *MediResource* has developed a digital health coaching platform that aims to motivate people into living a healthy lifestyle. By gaining an insight into one's health, it tailors a practical plan to achieve healthy results. The platform is also able to identify those at risk and improve the health of people with existing conditions.

For a more comprehensive listing of Canadian digital platforms, please refer to Appendix B.



## 6. ISSUES AND CHALLENGES OF ADOPTION

### Section snapshot

- ➔ Firm-level challenges to adoption of digital platforms include resource constraints; talent and skills mismatch; difficulty related to content generation; financing and policy-related challenges; unmeasured benefits or limited value of adoption; availability of too many platforms and selecting the right ones.
- ➔ 49% of businesses are wary of allocating resources for HR purposes.
- ➔ Technical digital platforms jobs that are and will be in high demand include software engineers, network engineers, data architects, content delivery engineers, algorithm engineers, cloud infrastructure engineers, and web UI engineers.
- ➔ 37% of Canadian service providers face challenges in finding workers with the right blend of skills. They are finding it increasingly difficult to fill their talent needs adequately. The pickier they get to find the right blend of skills, the longer it takes to fill a position and the problem gets exacerbated. These skills and talent shortages make growing a nascent sub-sector an increasingly difficult proposition.
- ➔ 34% of Canadian businesses find it difficult to balance digital content creation with ongoing business challenges.
- ➔ 26% of service providers face challenges with respect to access to capital and financing, exacerbated by inadequate policy support.
- ➔ 17% of Canadian enterprises have difficulty selecting the digital platforms they should be concentrating on utilizing well.
- ➔ 11% of Canadian businesses have yet to buy-in and fully utilize digital platforms due to a lack of understanding of the benefits derived from adoption.

Although adoption of digital platforms results in multiple benefits to enterprises and the economy, these platforms are not without their challenges.

### **Constraint on HR resources**

Enterprises often start with social media platforms, where someone within the organization is in charge of posting company updates. In most cases, it eventually snowballs and tending these platforms becomes a full-time job. Enterprises either recalibrate the job description of existing positions or decide to hire new staff or outsource.

The adoption of digital platforms is creating needs in enterprises to have dedicated staff to tend to and manage these platforms. In addition, digital platforms are increasing demand for workers that are highly conversant and skilled in digital platforms. Enterprises face the need to increase the capacity of existing staff or hire new ones for extended client reach. Even though digital platforms are reducing enterprise costs for sharing, communicating, disseminating, and broadcasting digital content, increasing needs for dedicated positions and ongoing staff development are creating pressure on business resources.

One in two (49%) businesses is still wary of allocating resources for these purposes (figure 13). To maximize the benefits and minimize the costs of adoption, enterprises first need to evaluate adoption options. A clear and accurate knowledge of the HR resource requirements to enable and support these processes is a vital starting point. That knowledge is a critical foundation for subsequent informed decision-making. Investing in skills to increase efficiency and productivity is the order of the day to generate high-value-added content. Effective HR strategies will help enterprises realize their aspiration to be a major player in their respective industries.

### **Talent and skills mismatch**

The evolving and expanding nature of digital platforms dictates that a large range of skills are needed for service providers to provide efficient,

user-friendly services and for adopters to use these technologies effectively. As a result, employers will seek employees with leading-edge skills, of which there is currently a worrying mismatch in Canada. Canada needs strategies and approaches to maintain its position ahead of the curve, as the growth of the economy will be constrained if we do not meet the continuing strong demand for skills.

An increase in uptake of mobile devices signals that digital platforms will continue to influence the labour market in the coming years. This will provide technical digital platforms professionals with new opportunities to apply their skills in a networked community. Simultaneously the wide reach of digital platforms will also benefit the non-ICT professionals from this growth, creating more jobs and adding to economic growth.

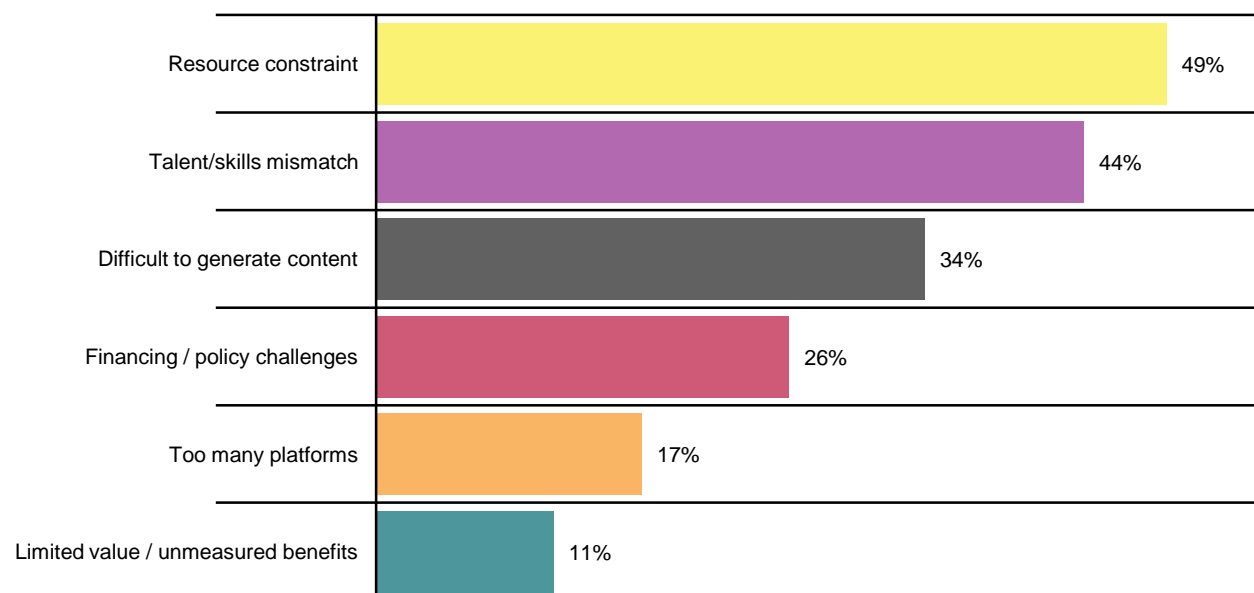
Industries that focus on delivering digital audio and video content are expected to demand the highest number of technical occupations, while demand from those that are not as intense on delivering heavy loads will also see modest gains. Sectors

such as healthcare that are also rapidly adopting digital platforms are also projected to have high demand for technical positions.

Digital platforms service providers must become expert at developing systems that provide options to interact with social media and simultaneously deliver content to the consumer. They will also need the expertise to interact with cloud networks to manage public sharing and storage of content.

Companies that are ready to roll out their platforms in the near future will require sales and marketing personnel to promote their respective platforms. On the technical side, the need for software engineers is expected to lead the demand, as they will play a key role in optimizing the platform performance on a given device given the existing infrastructure. Other development skills that are sought after by the industry include, network engineer, data architects, content delivery engineer, algorithm engineer, and cloud infrastructure engineer. On the design front, firms are primarily seeking web UI engineers.

**Figure 13. Concerns among business in adoption**



Source: ICTC, 2013



A third (37%) of Canadian digital platforms service provider enterprises face challenges in finding workers with the right blend of information technology skills, telecommunications skills, and broadcasting skills. Rapid developments in each respective industry have left industry and academia trailing the current needs. Service providing enterprises are finding it increasingly difficult to fill their talent needs. The more precise they are about the blend of skills they are in search of, the longer it takes to fill a position and the problem gets exacerbated. These skills and talent shortages make growing a nascent sub-sector an increasingly difficult proposition.

ICTC's consultation with subject matter experts and stakeholders reveals that skills requirements for providing and adopting digital platforms changes on a continuing basis, mainly as a result of the emergence of new platforms, devices, and user preferences. Ensuring a steady supply of competent workers is critical as skills become substantially specialized. It is, thus, vital that stakeholders take all necessary actions to provide the workforce with the required tools and support.

#### **Difficulty in content generation**

One of the biggest challenges Canadian enterprises face with respect to adopting digital platforms is battling the expectation to generate new digital content on an ongoing basis. In today's 24/7 environment, client expectations are skyrocketing and sometimes reach unrealistic proportions. The interactivity allowed by digital platforms is allowing enterprises to share information and get immediate feedback from clients on content and services. In return, clients expect a continuous stream of digital content. That too while enterprises are battling with HR challenges and resource constraints.

An added challenge is the ease of using digital platforms, or lack thereof. Workers will be more productive and efficient if they can avoid long and complex procedures. A majority of survey respondents report ease of content generation and use to be an important factor in the adoption of digital platforms.

A third (34%) of businesses find it difficult to balance digital content creation with ongoing business challenges such as maintaining and increasing customer base and targeting market segments with more precise product development.

#### **Capital and policy challenges**

Multiple expenses on the content supply side need to be offset—by viable revenue generating streams—if an enterprise is to grow, and access to capital remains a widespread challenge in Canadian small and medium enterprises.

A major area of concern for digital platforms service providers is lack of R&D spending compared to other nations such as the U.S., which has developed a number of digital platforms. An establishment of strong networks amongst post secondary institutions and industry along with ample access to resources has helped U.S. emerge as a dominant provider of digital platforms.

A quarter (26%) of Canadian digital platforms service providers face challenges with respect to access to capital and financing, exacerbated in part by inadequate policy support.

On the other hand, authorities such as public and state broadcasters and other supporting bodies continue to face challenges in anticipating technological and market changes to create the right legal, economic, and academic conditions to foster a new digital ecosystem.

#### **Continuous development**

Digital platforms have come a long way since first arrival. New developments are on-going and challenge enterprises' ability to select platforms that maximize benefits. No enterprise can use and employ all digital platforms, nor do they need to or can do it well. What businesses needs is to adopt and manage a select number of digital platforms efficiently. 17% of Canadian enterprises have difficulty selecting the digital platforms they should be concentrating on utilizing well. Rapid change in demand for various types and segments of digital platforms also pose challenge for service providers to concentrate on select platforms and create a niche.

### Unmeasured/unknown benefits of adoption

Investments in digital platforms adoption are driven by a need to enable better and modern business practices, as enterprises could achieve a quick return on investment (ROI) if they offer user-friendly solutions. However, that rate of ROI remained unmeasured and as a result unknown to date. A tenth (11%) of Canadian businesses have yet to buy in and fully utilize digital platforms due to a lack of understanding of the benefits derived from adoption.

### Bandwidth demands

The evolution of platforms and devices and their widespread adoption among consumers and businesses prompt these stakeholder groups to seek and offer products and services using digital platforms. This result in a higher concentration of traffic and can affect the service provided by the network. 11% of respondents to ICTC's recent mobile technologies survey report ensuring network reliability to be a major challenge in managing connectivity and mobility.

Wireless phone connectivity will reach 150 mbs and above by 2016 as a result of the advent of LTE technology, driving further innovation.

Networking between machines or sensors is leading a proliferation of machine to machine (M2M) to facilitate previously manually completed functions in areas such as security, utilities metering, maintenance, automotive, healthcare, and consumer electronics. A wide range of industrial sectors are utilizing M2M technologies and these machines will also enable accessing digital platforms in the future. Real-time information monitoring is becoming critical for enterprises to monitor progress in operations. It will be particularly critical for businesses in the healthcare, automotive, mining, and oil & gas sectors. Globally, M2M traffic will grow by 24 times between 2012 and 2017, when 9% of global M2M connections will be connected via 4G, nearly 59% by 3G and 32% by 2G, changing from 1%, 35%, and 64% respectively (Cisco Data Meter). As M2M becomes more prevalent and migrates from 2G onward to 4G technologies, the requirement for additional bandwidth will intensify.

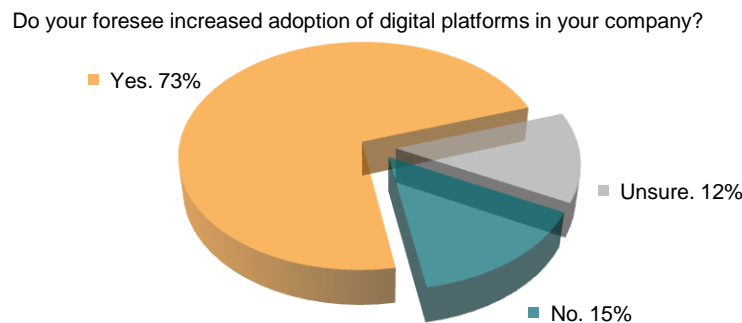
Easing of bandwidth and spectrum related challenges will encourage Canadian service providers to pursue development of newer platforms.

## 7. WHAT THE FUTURE HOLDS

Now that the capability and availability of digital platforms has reached a relatively mature status, these platforms are able to help willing Canadian businesses lower costs, improve efficiency and customer relationships, increase productivity, sales, and profits, improve mobility, research market and develop quality products faster, gather real-time information and collaborate to create

stronger innovation capacity. As a result, businesses are anticipating accelerated adoption of digital platforms. Among surveyed businesses, 73% foresee strategic and increased adoption of digital platforms in their business processes (figure 14). While 12% of the respondents remain unsure, increased adoption is unlikely for 15% of businesses.

**Figure 14. Digital platforms adoption — Opinion poll**



Source: ICTC digital platforms survey, 2013

It is becoming evident that digital platforms are revolutionizing business practices and thus impacting the entire economy in numerous ways. This is paving the way to generate revenue from content.

Increasingly, mobile devices will be equipped with high definition (HD) video display and recording capabilities. Consumer demand and subsequent economies of scale will reduce the cost of standardizing this component. Some manufacturers are developing three dimensional (3D) video and still photos capabilities by mounting two cameras on the devices to replicate the distance between the eyes. Other manufacturers are equipping devices with projectors to overcome the problem of relatively small screen size inherent in mobile devices.

Devices are becoming equipped with multiple core processors, enabling these devices to divide different applications between the processors, improving processing speed and battery life. As

components become more sophisticated, all devices will allow integration of a multitude of digital platforms through them.

By 2020, it is estimated that 50 billion devices will be connected. The proliferation of M2M will necessitate further creativity and most of the innovations such as automobile to automobile, telemetry, remote sensing and diagnostics for patients etc. will need new digital platforms to respond to the varying needs of the targeted consumer segments.

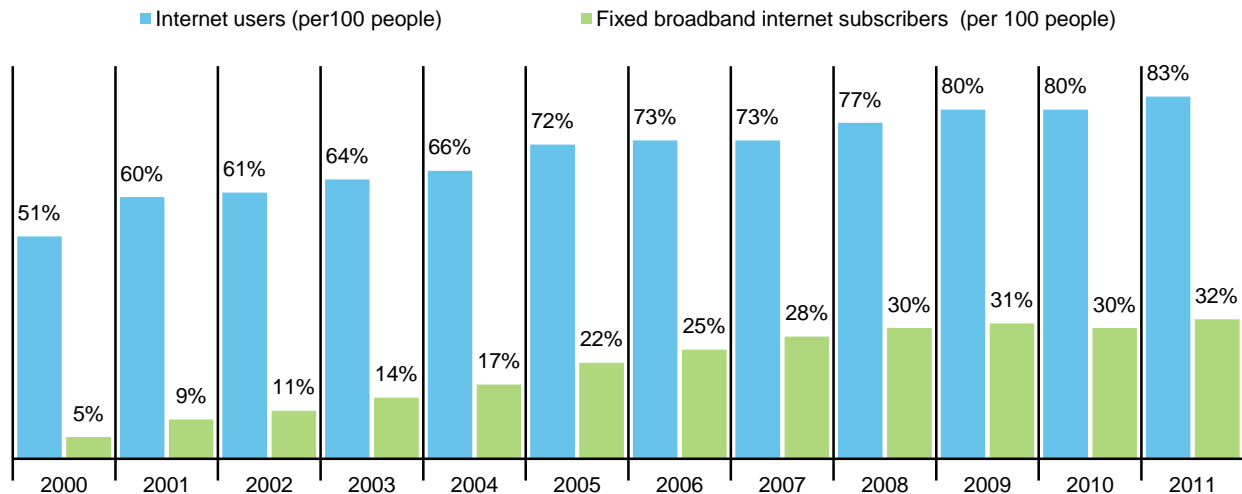
Growing in tandem with technological developments, digital platforms provide companies with benefits of additional functionality such as plug-ins, apps, and similar add-on services to consumers. Adoption of these platforms has resulted in a positive externality, where each user adds value for themselves and more importantly to other users in the network.

Bandwidth usage has escalated significantly as more and more content is made available to users, more so in the wireless broadband than fixed broadband area. A gigabyte equivalent of all movies ever made will cross global IP networks every three minutes by 2016 (Cisco Visual Networking Index Report). This demand is expected to improve connectivity for all users as an increasing number of people interact online, requiring upgrading of some of the infrastructure in place, to accommodate traffic (figure 15).

In the coming years, additional developments on the technical front are only going to improve dissemination of content. Social media tools will continue to expand coverage on a global scale, especially given the indispensable bond developed between users and platforms such as Facebook.

Elsewhere, a steady increase in the number of Canadian households accessing broadband services suggests additional future growth opportunities for such platforms, implicitly pointing towards an expansion of third-party developers.

**Figure 15. Canadian internet usage per 100 people**



Source: The World Bank; ICTC

Currently, Canada plans to auction some prime new electromagnetic real estate (spectrum auction), to allow telecommunication companies to expand services offered. One of the blocks to be auctioned off will be the 700-Mhz band, which was freed up by switching to digital TV. This would be the frequency market competitors will be interested in acquiring as they travel farther and easily penetrate buildings. The frequency will allow cell and smartphones to work in elevators and underground garages while supporting the new speeds delivered via the LTE network. Lifting barriers that earlier prevented a foreign company

to bid on such an auction may improve competitiveness in the telecom market.

The interaction between mobile technologies and cloud services will also remain vital in sustaining this demand, particularly with cloud services increasingly being adopted as the preferred mode of storage. Any developments in either of the two spaces will only encourage demand.

More people are increasingly interacting with social media and consuming digital content on mobile devices. Designing tools and applications for such devices will be of utmost importance as we begin to transition from a tethered to untethered space.

## 8. CONCLUSIONS AND THE WAY FORWARD

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### Section snapshot

- ➔ Adopter-level enabling measures and strategies include strategic adoption of digital platforms by all businesses and sectors; be aware of options and optimize the use of technological innovations that will make it easier and less expensive to adopt digital platforms to deploy services; manage clients' expectations in terms of speed, accountability, transparency, and improved delivery of services; sensitize employees and improve their capacities to function in a connected and digital workplace.
- ➔ Service provider-level enabling measures and strategies include continued provision of traditional services to enterprises that lack resources or willingness to adopt digital platforms; raise awareness of adoption benefits to encourage wider adoption; understand the needs of all users and make their offerings suitable and easy to use; recognize foreign talent to address the skills shortage and improve understanding of the highly competitive global market.
- ➔ Academic institution-level enabling measures and strategies include modify curricula to address industry needs and offer integrated, hybrid programs in timely fashion; develop new partnership models.
- ➔ Policymaker-level enabling strategies include measures such as tax holidays or credits to ease resource constraints and provide incentives and means to adopt digital platforms, thus enabling job creation and contribute to Canada's Economic Action Plan; promote adoption among businesses and provide marketing support to service providers; ensure SMEs and start-ups can adequately fund their activities; implement favourable tax incentives, generally competitive corporate tax rates, and initial protection aimed at startups; support programs that target youth at a younger age and encourage STEM programs.

Digital platforms have enabled mobile devices to become the fastest growing consumer technology in the world. Ongoing developments in storage, software codes, and devices continue to foster an environment that are changing business processes and creating new opportunities. The rapid change in consumer behaviour is indicative of a paradigm shift in the way creators develop digital content and target audiences access those content. This shift has resulted in disruption to established value chains as digital content can now be delivered at phenomenal speeds and at a substantially lower cost compared to previous methods.

Combining rigorous analysis and consultation with Canadian digital platforms adopters and service providers, this study is intended to share widely employed practices and provide reference and guidance to help all Canadian enterprises address the opportunities and challenges associated with adopting digital platforms. By enabling sharing of one-to-many and many-to-many, these platforms removed many of the previous limitations for sharing, communicating, disseminating and broadcasting digital content. Digital platforms are enabling Canadian enterprises lower costs, improve efficiency and customer relationships, increase productivity, sales, and profits, improve mobility, research market and develop quality products faster, gather real-time information, and collaborate to create stronger innovation capacity. These platforms have a positive and significant impact on overall economic growth by transforming existing and creating new content and delivery mechanisms.

In addition to providing a solid understanding of the context shaping digital platforms adoption and service provision, ICTC seeks to guide stakeholders consider measures and take action. The strategies outlined are the result of our analysis and insights shared by industry experts and thought leaders about the trends and challenges they face in trying to achieve a balanced level of digital platforms adoption and service provision costs and benefits. Which strategies any given enterprise will adopt and implement will be specific to their business scope.

### Adoption is important for all sectors

All companies are looking for smart and agile solutions. No industry or sector can ignore adoption, as digital platforms are proving to be an essential tool to offer content and services the modern way. Improving technological infrastructure is facilitating this and business entities are enjoying many of the benefits of adopting these technologies. More enterprises want to integrate digital platforms to their business process, creating additional market and sub-market opportunities for digital platforms service providers. It is important that service providers increase ties with all vertical sectors and sub-sectors to maximize reach and benefit from synergies. Industry-specific trade fairs will be beneficial where digital platforms service providers come to present their offerings for respective industry verticals.

### Caution is needed in employing platforms

To keep up with the increasing number and variety of platforms, enterprises can benefit from having a digital platforms policy and should continue to update it with changing technology and services. Establishing clear, business-specific internal policies that outline do's and don'ts with respect to digital platforms and what should and should not be disseminated through these platforms is very important, for control over offered digital content can be lacking otherwise.

Canadian enterprises continue to hire dedicated staff to create content and deliver that content using digital platforms. Without a clear digital platforms strategy, these workers can be underutilized. Although businesses may decide to outsource these roles, generally it is beneficial to the company to internalize these responsibilities.

Smaller enterprises need to allocate resources to provide their employees with the necessary skills. These actions would go a long way in harvesting the maximum benefit from digital platforms.

As companies strive to get instant feedback from their clients, it is crucial to remember that clients also use digital platforms with expectations that the discussion will be interactive and bi-directional. To meet this, the number of staff dedicated to manage

the digital platforms needs to be adequate. Providing employees with the necessary training to be able to handle the platforms, being clear and direct with clients about response timeline are some of the steps that can help companies ensure customers continue to engage with them and are satisfied.

The key point to always keep in mind is that digital platforms can be a double-edged sword and it is imperative to adopt wisely.

### Continue with traditional service delivery

Digital platforms service providers need to realize and be cognizant of the fact that regardless of high demand for digital content and services, there will remain a client base that will not have the resources or willingness to adopt digital platforms. As revenues generated from the digital platforms stream represents merely a quarter of the total business revenue on average for Canadian service providers, it is essential that they do not neglect clients that require traditional content and services.

### Raising awareness of benefits is critical

There is a strong need to create awareness of the benefits and advantages of adopting digital platforms among Canadian enterprises. Networking is vital to spread the word. To address the diverse needs of various industrial sectors, establishing standardized information for sector-specific users about how to adopt and best utilize digital platforms will encourage many to adopt and thus create growth opportunities for service providers.

### Resources are a major constraint

Resource allocation is a foundational constraint for adoption of digital platforms. Returns on investment for digital platforms adoption is quite high and introducing measures that are conducive to such adoption would be beneficial to Canadian businesses. Tying tax holidays or credits to digital platforms adoption is likely to provide adequate means and incentives for businesses to adopt quickly. As much of the resource constraint originates from HR issues, these measures will





also directly and positively enable job creation and contribute to Canada's Economic Action Plan.

Businesses need to be aware and optimize the use of technological innovations that will make it easier and less expensive to adopt digital platforms to deploy services. Policymakers could benefit enterprises by promoting adoption among businesses and providing marketing support to service providers. In addition, ensuring digital platforms service providers, particularly SMEs and start-ups, can adequately fund their activities is important. Policies that create demand, favourable tax incentives, and generally competitive corporate tax rates would be potentially beneficial. There should be some protection aimed at startups. Regional funds to generate activities in a particular geographic location have a checkered history and should be taken into consideration when formulating new policies. Policymakers should use the findings of this report as a baseline and raise awareness of the need to invest in the adoption of digital platforms. ICTC's considerable expertise in this area can be made use of to explore additional research areas, as necessary.

#### **Ease of use is vital**

In today's work environment, workers require skills both to interact with digital platforms (e.g. social media strategist) and to analyze the real-time data received using these platforms (e.g. data analytics). Digital platforms service providers need to understand the needs of both these groups and make their offerings suitable for all users. From the users' perspective, responsiveness to clients' expectations in terms of speed, accountability, transparency, and improved delivery of services is going to be critical.

#### **Labour shortages will hold Canada back**

Strengthening all employees' capacities to function in a connected and digital workplace is crucial. Not all employees may embrace digital platforms adoption due to lack of understanding or skills. Some may see new technologies, enterprise solutions, or business processes as a threat to their jobs. Sensitizing employees in this regard and providing them with the right tools to be successful in this new environment is very important for

business success. As the adoption rate increases and new genres of digital platforms emerge, availability of talent and right blend of skills among Canada's ICT workforce is going to be more vital than ever before, as Canada's competitiveness will depend on that. Meeting the continuing strong demand for appropriately-skilled workers is a big challenge. The combination of skills that is in highest demand consists of subject-matter expertise in information technology, telecommunications, and broadcasting, combined with technical knowledge and prowess, business acumen, and interpersonal abilities. Workers with right technical skills are rare; workers with the right combination of multidisciplinary skills are rarer still. This can only be achieved through a collaborative process that involves all stakeholder groups including workers, employers, educators, policymakers, technology advisors, and researchers. In addition, programs are needed that target youth at a younger age when they are still making decisions about their courses and career options, when they are being influenced by peers, teachers, and parents away from STEM due to misinformation about the opportunities. Furthermore, foreign talent needs to be recognized and welcomed to address the skills shortage. They also have a detailed understanding of the global market, thus facilitating Canadian service providers to establish a strong foothold in a highly competitive, borderless environment.

#### **Skills mismatch looms as a critical challenge**

There is a disconnect between what industry looks for in terms of skills and what Canada's post-secondary system is currently producing. This is partly the result of the long lead time required to create new academic programs. The gap cannot be addressed by either industry or the post-secondary system acting in isolation. Many universities and colleges have introduced programs that combine ICT with other fields. Educators need to ensure that their programs are reflective of the changing industry demands and their graduates are fully equipped and prepared to fill these needs. Post-secondary institutions require the assistance of a real-time tool to forecast future skills needs at the national and regional levels so that they can modify their curricula to address employers' needs and offer integrated, hybrid programs in timely fashion.



### **Up-skilling of the workforce has to be a collaborative effort**

If corporate tax credits are tied to labour market practices to encourage focused (e.g. youth, women, immigrants) hiring, service providers will have both incentives and means to provide training opportunities to staff so they may upgrade their skills—a once common practice that has regressed since the onset of the recession. Women are 50% of the population, yet greatly underrepresented in the ICT workforce. ICT jobs face significant image and perception problems, including the view that they are singularly computer-focused, male-dominated, lacking in social relevance, and predominantly anti-social. A gender-bias in STEM education and employment is widely known and thus there are few visible role models for young women. Concerted, cooperative promotion and outreach efforts are needed to counter the perceptions that there are fewer opportunities in STEM and ICT and that the careers are not stimulating.

### **International exposure broadens horizon of our workers**

Canadian employees are becoming more aware of the need to broaden their horizons and are actively looking to get international assignments to learn and grow. Employers should actively help in this endeavour, as the end result is more rounded employees and that would be beneficial to their companies too. Workers can learn about local issues from local client and providers' perspectives and bring that learning back to Canada and improve the offerings of Canadian digital platforms service providers with additional relevant factors taken into consideration.

### **New partnership models are necessary**

Taking advantage of the compelling global opportunities will require scaling up, but in the digital platforms environment, partnership is required and critical to scale in a way it might not have been previously. It is important for a digital platforms service provider to have big reach, but that reach is likely to be achieved through partnerships. Small companies' offerings may be embedded into larger integrated offerings, and

large partners can assist in opening export doors. Companies, particularly large and established ones, have a corporate social responsibility to help nascent SMEs.

### **Significant global opportunities**

Most Canadian digital platforms service providers are domestically-focused. But, an excellent blend of advanced technological, research, and corporate infrastructure means that Canada offers unique opportunities and brand Canada needs to be built and promoted around this theme. Canada has the essentials to be a key developer and enabler of digital platforms, and stakeholders need to promote Canada as a place that platform developers should consider to enhance growth. Canadian digital platforms service providers can be proactive and direct in promoting their work. Industry and policymakers need to devise a strategy and take active part showcasing their products and services internationally. Promotional activities need to go beyond highlighting available technology and promote the amazing skills and talent available in Canada. Local knowledge is just as important as domain knowledge to be able to deliver a cutting edge platform solution, particularly in the global market.

### **Policy support is vital**

Policymakers need to play a pivotal role to support nascent digital platforms service providers, who are endowed with significant growth potential, especially given the low barriers to entry and existence of strong infrastructure.

The federal government has excellent programs in place to support innovation, research and development, and export. Programs such as [IRAP](#) and [SR&ED](#) are doing an excellent job in this regard. There are government bodies such as [Canada Media Fund](#) and [Ontario Media Development Corporation](#) that assist digital platforms and content service providers, both directly and indirectly through other bodies such as and [Canadian Digital Media Network](#). More effort, however, is needed to raise awareness of these programs and simplify the processes for SMEs to



access them. Policymakers need to play a facilitator's role and assist SMEs with export, organizing international trade shows, networking with potential international client and showcasing Canadian offerings in the international arena. Digital platforms service providers face low barriers to entry and supporting these SMEs, particularly start-ups, is crucial. In comparison with capital-intensive subsectors, potential for growth in jobs and revenues is strong and public authorities can put this subsector on a sustainable growth path with relatively low investments. Policy-makers in competing jurisdictions provide notable support and protection to their entrepreneurs. For example, South Korea has a friendly domestic market that allows Korean companies to perfect their products in a friendly domestic market before going global.

Strategies need to facilitate service providers to deploy the latest digital platforms products and services and help businesses adopt these platforms for efficiency and productivity gain. Providing incentives for enterprises to utilize and leverage digital platforms could be useful. Policy-makers can provide encouragement for more advanced data connectivity and encourage the rollout of competitive, advanced telecommunications networks, as adoption of advanced connectivity increases with decreasing costs. Policy-makers' knowledge and understanding of the digital platforms industry is not ideal. Regular conversations with the industry need to take place on an ongoing basis and an independent body such as ICTC can facilitate that.

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## Appendix A – Economic impact analysis

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ICTC's estimate of \$7.3 billion generated annually in GDP due to creation and increasing adoption of digital platforms in Canada is based on a multi-step calculation. We measure the contribution to GDP an average Canadian worker makes, based on the latest available GDP and labour market data. Workers' occupational focus (e.g. technical or non-technical) and employment status (e.g. full-time or part-time) are taken into consideration in the estimation. We then use our original research findings with respect to employment level to estimate the GDP contribution from businesses adopting digital platforms.

Similarly, we measure the contribution to GDP an average worker working in Canada's ICT sector makes, based on the latest available ICT sector GDP and labour market data. We then use our original research findings with respect to employment level to estimate the GDP contribution from enterprises that are involved in developing digital platforms products and services. Again, workers' occupational focus (e.g. technical or non-technical) and employment status (e.g. full-time or part-time) are taken into consideration in the estimation.

The final estimates are reported in current (2013) dollars.

We use equations from our forecasting models to estimate the future GDP contributions from creation and adoption of digital platforms, under the assumption that measures and strategies suggested in this study to stimulate the Canadian economy with increased creation and adoption of digital platforms will be implemented to enhance the GDP contribution by a further 20 per cent. Anticipated inflation rates—based on historic trends—are also taken into consideration in this projection.

Changes in the baselines (e.g. productivity levels) may affect the projected future estimates. However, these estimates still constitute a realistic approximation of GDP that will be generated due to creation and increasing adoption of digital platforms in Canada.

## Appendix B – Canadian digital platforms

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- Adventusmusiq.com
- A summary reporting system that is shared with people in the health field
- All the right type 4online
- Applicant tracking software
- Art gallery of Ontario 'express yourself' app
- Brando
- Camillion
- Canadian tire app
- Commerce cm
- Communauté durable
- Competences generiques asc
- Courthousejmf
- Dbdoc
- Easy rtc
- Ebase (community use of schools module)
- Egc
- Elector
- Engagement console
- Enterprise information management system
- Equicare cs
- Era certis
- Era environmental management systems
- Era house and safety systems
- Experience station
- Expresskiosk (express account)
- Fetch
- Fine tune
- Goldcare
- Gomobile solutions
- GPS rain calculator on blackberry
- GRM
- Hoop
- Gaming platforms
- Industry mail out
- Inmedia
- Kudos
- Libatns
- Loki
- Loki blue force tracker
- Loki client
- Loki laptop tracker
- Loki smart phone tracker
- Mag cast
- Medeo
- Mult-ip
- Ngateway
- Ngateway
- Pds-exchange



- Prime code
- Qfimsoft
- Quantaplex
- Reseau ovation
- Romeo reasearch enterprise
- Scorebug
- Sedeen viewer
- Shift it
- Site cm
- Smartdock
- Smartmech
- Space list
- Super ticker
- Tabture
- Toolcase drupal
- Ts consign
- Ts link
- Tweetout
- Open source and proprietary content management systems
- Internal platforms that provides public content
- Weblys
- Winealign
- Supporting apps, products, and services for other platforms such as Android, Blackberry, Facebook, iOS, iTunes, Joomla, Reddit, Windows, YouTube etc.



## About ICTC

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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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