Defining the Global Opportunity for Canadian Firms:

A Road Map for Mobile Apps Stakeholders

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CONTEXT

Smart devices and the emergence of ubiquitous, reliable and high-capacity wireless Internet connectivity have rapidly changed perceptions of mobile computing and machine-to-machine communication. Canadian consumer and enterprise expectations of how they can interact, consume, transact and create have been revolutionized by the emergence of smartphones and tablets. Soon to be ubiquitous, smart devices have surmounted a difficult challenge: how to put very sophisticated computing power into a form factor so simple a child can use, available everywhere. The consumerization of IT has raised expectations that enterprises will benefit from the same ease of use and devices.

Consider how astonishingly complex a smartphone or tablet really is in 2013. It combines 802.x, GPS, LTE, Bluetooth and near-field communication radios – often in several configurations for different geographies. It combines, seamlessly, an accelerometer and gyroscope, touch-screen, speakers and audio outputs, microphone and audio inputs, and multiple cameras. Its connectivity allows it to leverage rapidly evolving cloud storage and computing architectures to extend its otherwise powerful processors and multiple Gb of storage. All of these are tightly integrated by operating systems built from scratch to take advantage of these capabilities.

In late 2012, the Information and Communications Technology Council (ICTC) published a study of the Canadian apps economy. It found that there are over 50,000 Canadians employed in the creation of apps, whether in a technical or other capacity. The plurality of enterprises engaged in creating apps (40%) is doing so on purely service basis, and the remainder are largely focused on service work with the occasional creation of original IP.

It is ICTC's contention that a sector focused on the creation of consumer apps, on a service basis, is an unlikely focus of business, policy or educational attention. In the meantime, however, ICTC considers that smartphones and tablets – and future iterations of those – are much more likely to add real value to enterprise rather than consumer appetites for software. Low-tech and no-tech verticals around the world are ripe for improvement through the application of technology, and even already-high-tech verticals have yet to fully exploit a new generation of hardware.

In Canada, 95% of companies have fewer than 50 employees and 85% have fewer than ten. In an uncertain global economy, it is important to scrutinize Canada's business and policy environments and ensure that Canadian SMEs are primed to contribute to the economy as larger corporations have done. Mobile applications and technologies are being recognised as a sub-sector with enormous potential to contribute to the Canadian economy, but coordinated stakeholder activities are required to strengthen and grow the sector.

To explore these opportunities, the Information and Communications Technologies Council (ICTC) organized on February 6 a thought-leader workshop to engage stakeholders in the mobile and applications sub-sector, and explore challenges and opportunities for growth. Export Development Canada (EDC) leveraged its extensive network to ensure representation from a cross-section of stakeholders. Participants in the session are listed at the end of this document.

The group was asked to consider what industry, educators and policymakers could do to move Canadian ICT businesses to take advantage of the compelling global opportunities for the sub-sector. Participants spoke of the necessity to ensure that the public sector and large-sized companies procure goods and services from innovative companies within the sub-sector. It was also recognized that while multiple policy supports are important, it is also critical to that removing barriers of red tape and unduly restrictive

regulation will be an important factor in enabling Canadian business growth and competitive advantage. In a highly competitive environment where various jurisdictions are competing with one another, economic activities will naturally migrate to jurisdictions that have the fewest policy frictions.

The workshop enabled a wide-ranging discussion among participants. On many issues, there was consensus, while other topics were raised and received attention. The bulk of the day was devoted to a roundtable discussion among the approximately 35 participants. Four presentations were provided that offered food for thought for this conversation.

At the highest level, this session re-traced ground well-understood in the Canadian technology space. Small companies struggle to become big in the face of a small domestic market, the difficulties of selling internationally, a dearth of capital, and a competitive marketplace for talent.

Significant discussion was had of the need for a culture in Canada that rewards both risk and failure, and of the need for visionary individuals who can drive enterprises to global levels. There was no lack of ambition around the table. To accomplish this, as set out in the pages below, the working group considered that the following are necessary:

- Businesses should be encouraged to innovate using Canadian-developed apps;
- The right talent is critical;
- Canada must develop a culture of support for SMEs;
- Export is the ultimate objective of policy and other support;
- Large enterprises have a corporate responsibility to help SMEs grow; and,
- Communications channels should be developed that showcase Canadian success stories.

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1. Mobile adoption is important for all verticals and business entities

Participants did not identify that one vertical market or even group of vertical markets presents a particularly compelling opportunity compared to any other. Participants heard a diverse group of presentations and case studies considering the public sector, resource extraction and retailing. Other verticals such as health care provision and media and entertainment were all considered.

Takeaways...

1.1. Companies in multiple verticals are looking for mobile, agile and smart solutions. Establishing standards will help create common principles and avoid duplication. For instance, Microsoft makes reference architecture (a template solution for a particular domain) available for SMEs to adopt and use.

1.2. There is a strong need to create awareness of the benefits and advantages of adopting mobile technologies among Canadian business entities. Service providers will have to take lead to highlight their offerings and networking is vital to spread the word. The sector, however defined, would benefit from information sharing and companies would benefit from vehicles through which to showcase their successes.

1.3. To address the diverse needs of various verticals, establishing standardized information for industry users of how to utilize mobile technologies will encourage many to adopt and thus create opportunities for service providers.

1.4. More mobile applications will create greater demand for bandwidth. Industry and policymakers should collaborate on ensuring a sufficient supply.

1.5. Funding is a major constraint for businesses entities and the public sector to adopt the latest available technologies (e.g. public safety).

1.6. Government could benefit enterprises by promoting adoption among businesses and providing marketing support to service providers. Its role as a significant procurer cannot be under-emphasized.

2. Talent is Canada's biggest asset and challenge

Automation and adoption of technologies are important, but workers that may express discomfort about job security as a result of adopting these technologies, and may be the source of resistance to change. This may persist in the absence of comprehensive communications initiatives.

In today's work environment, workers require skills both to interact with mobile technologies (e.g. field workers) and to analyze the real-time data received using these technologies (e.g. data analytics). App developers and technical specialists need to understand the needs of both these groups and make their offerings suitable for both groups.

Canada's competitiveness depends on the skills level of its workforce. Meeting the continuing strong demand for appropriately-skilled workers is a big challenge. Leading-edge specialized skills (e.g. engineers, software programmers) and implementing skills (e.g. systems managers, analysts) are in short supply.

The combination of skills that is in highest demand across the country consists of subject-matter expertise combined with technical knowledge and prowess, business acumen, and interpersonal abilities. The ability to market and sell are now required to be intrinsic to almost all job functions. Workers with right technical skills are rare, workers with the right combination of multidisciplinary skills are rarer still. Building improved technologies is not as important in this environment as identifying and marketing for new opportunities.

Enrolment in science, technology, engineering and math (STEM) programs has been disappointing for some time. Many businesses entities have outsourced ICT functions. Outsourcers are a principal vehicle for off-shoring Canadian ICT work and also significantly alter the regional distribution of ICT employment by locating work in regions where labour costs are lower. Off-shoring gets bandied around quite extensively in the media and it creates apprehension among parents and youth, who worry that technical jobs are being outsourced. They are uncomfortable in choosing STEM-related career paths.

There is a distinct disconnect between what industry looks for in terms of skills and what our 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 colleges have already instituted a practicum component to their programs. Progress has been slower in the university system. Many universities and colleges have introduced programs that combine ICT with other fields.

Takeaways...

2.1.   From a policy perspective, an expansion of the supply of the right kinds of skills is required. This can only be achieved through a collaborative process that involves stakeholder groups which have a key role to play — including educators, employers, employees, policymakers, industrial technology advisors (ITAs) and researchers.

2.2.   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.

2.3.   Post-secondary institutions need to actively network with industry to organize career days and expos, invite guest speakers to speak with students to keep them encouraged and motivated. Schools also need to communicate to prospective students new or modified program options and the careers to which those lead.

2.4.   The University of Waterloo is a potential case study to showcase successful STEM programs (e.g. engineering, computer science). U of W graduates are highly valued and in demand. The school may be an examplar to be replicated by other academic programs in other regions.

2.5.   Providing incentives to students and jobseekers in the form of targeted scholarships or reduced tuition in STEM programs could help fast-track growth in in-demand skills. It is also imperative that

students and job seekers know that they will be able to gain practical hands-on experience as part of their program.

2.6.   The creation of innovation centres or talent incubators can bring together businesses and mobile technologies service providers to provide hands-on experience. For example, Communitech's support for businesses creates a pool of skilled workers in the region who can participate in different projects.

2.7.   ICTC administers a career focus program that helps SMEs with some additional funding to include young post-secondary graduates in their workplace and increase productivity. The program also aids youth across Canada to build their employability capacity and develop their skills. This could be expanded to the benefit of industry.

2.8.   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.

2.9.   Women are 50% of the population, yet greatly underrepresented in the ICT workforce. The ICT sector faces significant image and perception problems, including the view that is 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. This is not an easy task and requires the industry to take an active role in communicating more effectively. An outreach campaign is critical to reducing the negative perceptions that have become associated with careers in the ICT sector.

2.10.   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 in some cases due to misinformation about the opportunities.

2.11.   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 (more rounded employees) would be beneficial to their companies too. They can learn about local issues from local client and service providers' perspectives and bring that learning back to Canada and improve the offerings of Canadian service providers with additional issues taken into consideration.

3.   Scaling up is necessary to sustain growth; a culture of supporting Canadian companies

For a variety of reasons, Canadian businesses do not actively purchase from Canadian vendors (and foreign multinationals based in Canada), and the domestic market is small in any case. Procurement policies could play a key role in overcoming this, but assists to export such as are provided by BDC, EDC and DFAIT also fulfil a critical function.

Taking advantage of the compelling global opportunities will require scaling up, but in a mobile technologies environment, partnership is required and critical to scale in a way it might not have been previously. It is important for an apps developer 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.

Technological infrastructure is reaching a point where improved services can be delivered using mobile technologies. Business entities are enjoying many of the benefits of adopting these technologies and want to integrate them to additional areas (e.g. healthcare providers can expand on offering mobile technologies-enabled services onsite to private residences to provide care for the elderly). This creates additional market and sub-market (or additional sub-sector) opportunities for service providers.

Takeaways...

3.1. Local partnerships can be leveraged to establish best practices and "fail fast" with new products and service offerings before investing in export attempts.

3.2. It is important that the mobile technologies service providers increase ties with all vertical sectors and sub-sectors to maximize reach and benefit from synergies.

3.3. Subject matter expertise (e.g. app developer) and domain knowledge (e.g. sectoral knowledge) are both critical. Only when these are combined optimally can a robust application be developed and deployed. Without domain knowledge and partnership with vertical companies, much-needed access to distribution channels is lacking to compete and expand in the international market.

3.4. Larger companies have established 'comfort zone' partners and it is often difficult for 'outsiders' to break through and create partnerships. Less well-known SMEs can face challenges opening door at large multi-nationals. Participants at the workshop identified this challenge as one that urgently requires addressing.

3.5. 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.

3.6. Industry-specific trade fairs will be beneficial where mobile technologies service providers come to present their offerings for respective industry verticals.

4. Significant global opportunities

Most mobile technologies 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.

Takeaways...

4.1. Concerted effort is needed from all stakeholders. Canadian mobile technologies service providers can be proactive and direct in promoting their work.

4.2. 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.

4.3.   Pricing strategy is critical and Canadian service providers need to ensure that they do not price themselves out of the market while showcasing their profiles in the global market.

4.4.   Local knowledge is just as important as domain knowledge to be able to deliver a cutting edge mobile solution, particularly in the global market. Immigrants, diasporas and international students need to be utilized appropriately to help with this by bringing their existing contacts and relationships to a company – if those are leveraged effectively by their employers.

4.5.   Foreign talent needs to be recognized and welcomed not only to address the skills shortage, but also because they have a detailed understanding of the global market, thus facilitating Canadian service providers establish a strong foothold in a highly competitive environment.

4.6.   The same low barriers to entry that characterize the development of mobile technologies in Canada exist throughout the world. Wherever possible, policy measures should leverage existing competitive advantage with respect to sector expertise in such verticals as gaming, finance, e-health and digital media where Canada enjoys rich ecosystem clusters and a legacy of innovation and success.

4.7.   "Fast failure" was a recurring theme of the workshop. A Canadian "culture" that is risk-averse and loath to declare failure risks sub-optimal allocation of resources. Participants emphasized the need to model the behaviour of companies more willing to take risks, and in which "big bold personalities" are frequently seen throwing the dice on innovative ventures.

5.   Large companies can help SMEs grow

Companies, particularly large and established ones, have a corporate social responsibility to help nascent SMEs.

Takeaways...

5.1.   An intermediary resource centre for SMEs is needed to act as a clearing house and provide SMEs with 'one-stop' support. Industry collaborators such as ICTC, NRC / IRAP, or the Ontario Centres of Excellence can facilitate that. There is a need to share information with SMEs, facilitate them, providing them with the right network, contact, support structure and platform as relevant. Highlighting best practices, challenges, lessons-learned and strategies to combat those challenges are critical information for start-ups.

5.2.   Mentoring SMEs and their key personnel and informing them of various available industry support programs and how to access such programs can play a vital role in a company's development and growth. Established companies should play an active role in this regard.

6.   Policy support is vital

The federal government has excellent programs in place to support SME innovation, R&D and export. Programs such as IRAP and SRED are doing an excellent job in this regard. There are government bodies such as CMF and OMDC that assist mobile technologies and digital content service providers. More effort, however, is needed to raise awareness of these programs and simplify the processes for SMEs to access them.

Mobile technologies 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. However, workshop participants were clear that businesses being run for the "love of them" – or "lifestyle" businesses – should be allowed to fail rather than divert resources to them.

Policymakers in competing jurisdictions provide notable support and protection to their entrepreneurs. For example, South Korea has a friendly domestic market that allows Korean companies perfect their products in a friendly domestic market before going global. That is not the contemporary environment in Canada.

Takeaways...

6.1. Ensuring mobile technologies service providers, particularly SMEs and start-ups, can adequately fund their activities is important. Procurement policies that create demand, favourable tax incentives, generally competitive corporate tax rates, and others would be potentially beneficial.

6.2. There should be some protection aimed at startups but regional funds to generate activities in a particular location geography have a checkered history. This should be taken into consideration when formulating new policies.

6.3. Policymakers need to create awareness of the various available government support programs and resources among start-ups and SMEs.

6.4. Policies need to facilitate service providers to deploy the latest mobile technologies and help businesses adopt these technologies for efficiency and productivity gain. Providing incentives for enterprises to utilize and leverage mobile technologies could be useful. Policymakers 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. Adoption of mobile technologies can be improved and thus productivity raised by creating awareness of the benefits and linking tax benefits to adoption.

6.5. Legislative frameworks with respect to intellectual property need to be strengthened. Policymakers need to help put necessary structure in place and strengthen existing ones, as needed.

6.6. Policymaking should focus on doing a few things extremely well, as opposed to tackle all issues at once and do nothing all that well as a result.

6.7. Policymakers' knowledge and understanding of the 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.

7. Visionary leaders needed

Visionary technology leaders can lead the integration of digital and mobile technologies in the business environment. There are such leaders in Canada, the challenge is to find them, highlight their vision and give them a voice in the media so that that vision is shared.

Takeaways...

7.1.   It is important to highlight and share success stories. Making media aware of such stories for wider dissemination, and not only in Canada, but internationally too, will help promote and build profile of brand 'Canada'. Success stories for media, and lessons-learned for people in the industry.

7.2.   Industry should leverage mobile technologies to create a platform where alternative ideas or solutions are welcomed from all workers and not just decision-makers. That will lead to a gain in independent thinking, creativity, innovation, organizational learning and decisional rigour.

CONCLUSION

These formative years are crucial in laying a strong foundation for sustained success. Sound skills policy, an attractive investment climate, and collaboration among all stakeholders of mobile technologies are all key ingredients of growth and for attracting investment, as well as for Canada to gain maximum benefits from workers' productivity gains. Targeted policy measures can create a better functioning mobile ecosystem to benefit from competition, strengthen the business environment, and improve efficiency.

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