Canada’s Digital Future

By Sylvia Kingsmill, Partner and National Lead, Digital Privacy and Information Management, and Armughan Ahmad, Canadian Managing Partner, Digital and Technology Solutions, KPMG in Canada

Canada’s digital ambitions are gaining speed, but there is ground to be gained to match – if not lead – our global peers. This is why KPMG is proud to be counted among the Canadian government’s allies consulted by The Honourable Navdeep Singh Bains, Minister of Innovation, Science and Economic Development, to help define the country’s digital objectives and set a roadmap for transformation.

Part of our consultations required taking a critical lens to Canada’s digital maturity, the steps it has taken to become a more digital nation, and the trends and challenges that will define its next steps. To do this, we have enlisted subject matter experts from across KPMG’s network to examine core issues, trends, and strategies that will ultimately shape our future digital state.

There are challenges along the way. Despite Canada’s success in seeding innovation hubs across the country, and our globally-recognized successes in the fields of artificial intelligence (AI), automation, and advanced data tools, we continue to lag on the world stage. We have been slower to commercialize innovation; foster an adequate supply of sciences, technology, engineering and mathematics (STEM) talent; and raise levels of awareness and interest for innovative new resources and processes among the Canadian people. Moreover, our vast geography makes it a challenge to ensure equal access to fast, reliable, and affordable high-speed internet for all; while international competition makes it equally difficult to keep our tech and innovation leaders from pursuing opportunities outside our borders.
These are all worthy obstacles, but they are far from insurmountable. To rise to our potential, we must:

– **Own the podium**: In a sea of global giants, we need to think bigger. Canada should refocus a percentage of federal growth-oriented programs to support high-performing scale-ups – both to promote subject matter expert (SME) growth and build a community of digital anchor firms. We must also take better advantage of the groundbreaking research coming from our colleges and universities, ensuring that our academic perspectives and findings are getting their due attention and global recognition.

– **Secure the talent**: Despite advances in robotics, AI, and automation, human talent remains integral to the growth and ongoing health of Canada’s digital strategies. Cultivating STEM talent requires re-thinking education curriculums, forging new paths to STEM careers, expanding our global skills strategy, exploring new ways to entice international talent, and encouraging innovation through initiatives like a Digital Skills and Talent Collaboration Hub.

– **Lead by example**: To inspire digital transformation, the Canadian government must practice what it promotes. Our leaders need to think digitally in terms of how the government interacts with its people, how it transacts, and how it leverages technology to provide more efficient, connected, and reliable public services across the nation.

– **Promote outcomes-based regulation**: Canada’s tech start-ups need to be able to grow and innovate at the speed of their competitors around the world. The government must do its part by overseeing the industry in a way that allows for experimentation, flexibility, and adaptation. Otherwise, lining their path with red tape and time-consuming processes will cap their ability to maneuver in a fast-moving digital world, one where AI is gaining traction and requires agility for market adoption.

– **Support a digital society**: That occurs through investing more in digital technologies (Canada currently spends 2.2 percent of its nominal gross domestic product (GDP) towards digital technologies, less than the 2.7 percent of the OECD average); prioritizing and accelerating universal, equal, and affordable connectivity; encouraging digital technology adoption by businesses; and executing multi-faceted promotional campaigns.

– **Leverage intellectual property (IP) and promote the value of data**: We must ensure that Canadian companies and creators can monetize and protect their data and IP. We can do so by updating data protection laws and both national and international standards on AI and ethical use of automated decision systems; creating a national, industry-led advisory council; investing in the application of AI and a data-driven economy; creating large and open data libraries; and embedding Canada’s IP strategy into government funding programs.

Like any worthwhile journey, one rarely goes the distance alone. That is why, in addition to the objectives above, KPMG has connected with our SMEs to discuss how Canada can further harness the skills and lay the groundwork for the ‘smart’ cities, businesses, and governments of the future. Read ahead for insights on our digital future.

**Let’s do this.**

“There are five superpowers of technology driving the revolution of digital economies: cloud, data, AI, mobility, and Internet of Things. Canada needs to decide how it wants to be part of that revolution and how it is participating in the advancement and adaptation of these disruptions.”

Armughan Ahmad, Canadian Managing Partner, Digital and Technology Solutions, KPMG in Canada
Intelligent Process Automation

There is a habit of equating intelligent process automation (IPA) with replacing human jobs, but this could not be further from the truth. Even in their most basic form, automation technologies can simplify processes, accelerate services, and free government employees’ time and energy to deliver impactful public services.

It is not about the ‘rise of the machines’, it is about unlocking real human potential.

Rapid and non-invasive by nature, IPA technologies make government business models more nimble, accurate, cost-effective, and reactive to their constituents. Moreover, they create stronger efficiencies, bolster data security and governance, and enable public sector workers to focus on higher, value-added activities.

The price of entry is low and the options are many. Automation technologies run the gamut from basic rules-based applications to more intelligent ‘learning’ and ‘reasoning’ tools, and there are already a host of tested and trusted ‘plug-and-play’ solutions in the market. The government would be best served by starting small with ‘rule-based’ technologies (e.g. robotic process automation (RPA) and robotic desktop automation (RDA)) to drive better mission outcomes and branching out to various cognitive methods (e.g. artificial intelligence, predictive analytics, natural language processing, etc.) as opportunities arise.

Put simply, IPA technologies are primed for public sector adoption. They can be embedded with minimal disruption, integrate seamlessly with existing systems, and do their job around the clock.

Like any new addition to the team, however, steps must be taken to create a symbiotic person-machine ecosystem. That involves identifying which processes are primed for automation, conducting a ‘proof-of-concept’, and training staff on their new digital colleagues. Most importantly, it requires a deployment roadmap to ensure automation technologies have the best chance of capturing immediate and sustainable benefits.
Canada faces no shortage of challenges in the global arena, obstacles that require innovative technologies to overcome. Chief among these digital tools is blockchain technology, which can provide the agility and connectivity to expand market opportunities, link to global supply chains, and gain a competitive edge. In order to reap the full benefits of blockchain, however, the Canadian government needs to be as vested in the new technology (if not more so) than other governments around the world who are already actively pursuing blockchain innovation.

Blockchain can help organizations of any size cut through the complexities of global business. By uniting partners on an open, peer-to-peer digital ledger, organizations have the power to track the movement and condition of goods among every manufacturer and distributor in their supply chain with greater accuracy, ease, and security than ever before.

As with all digital technologies, the key is integration. With the ability to integrate trade financing on a blockchain, for example, companies have access to financing based on real-time inventory and/or receivables. This can potentially remove or minimize requirements, and free up much-needed capital to significantly improve cash flows. Similarly, adding insurance to the ‘chain’ grants insurance companies the ability to track goods throughout their journey, generating rates based on real-time conditions.

Blockchain can also provide Canada with a competitive advantage. In combination with Internet of Things (IoT) sensors and self-reporting devices, organizations can verify the provenance of every material and product in their chain, verifying to consumers if they are ethically-sourced, safe, and ‘made in Canada’. Moreover, in the case of lost or damaged goods, entities can use those same resources to trace defective products back to their specific source, nullifying the need for expensive mass recalls and preventing future issues, including safety of Canadians.

No doubt, the power to track and record every aspect of a product’s journey can offer unprecedented advantages. Herein, there is an immediate need for the government to drive blockchain-based supply chains by supporting blockchain infrastructure (e.g. 5G), creating a blockchain-based customs platform that can accelerate customs approvals, and supporting innovations in IoT, artificial intelligence, and other related digital technologies – all with the end-goal of helping organizations break through the barriers to both domestic and global success.
Connected Consumer

We are witnessing the rise of the connected consumer; a demographic fueled by mobile innovations, on-demand services, and tech-savvy expectations. Canadians are slower to join these virtual ranks than their global peers, but it is a matter of time before their swelling numbers drive demand for stronger governmental support and assurances.

One can look to Asia for a glimpse of what is to come. Here, the proliferation of mobile devices and online engagement is staggering, and citizens are using connected tools to augment nearly every aspect of their lives. They expect cutting-edge infrastructure, uninterrupted access, and service providers who can cater to their 24/7 expectations.

As these online habits evolve, Canadians will rightly expect their data privacy and security to remain a priority among everyone in their digital ecosystem. They will also drive demand for a faster, more secure, and more reliable digital infrastructure that can keep pace with their digital lives. Naturally, the government will have a central part to play in meeting those expectations.

And yet, data security and privacy is no longer a guarantee. All the regulations and controls in the world cannot nullify the risks of the cyber world. Incidents will happen, and that is why the government’s relationship to its online consumers will always be tenuous at best.

This is a reality that many consumers around the world have already made peace with. That includes Asian consumers and, indeed, many of Canada’s newcomers who come from countries where being connected means trading a degree of digital security.

Still, to encourage a thriving digital society, the government will need to build and honour a modern social contract with its digital consumers – one that ensures the value of its online services far outweigh potential risks and one which is always working to protect today’s (and tomorrow’s) connected consumers.

Peter Hughes
Partner and National Lead, Customer
KPMG in Canada
416-777-8594
phughes1@kpmg.ca
Digital Identity Management

In the information economy, every byte has value. To protect our virtual assets, we must shield Canada’s digital strategy with cyber controls that can protect both public and private sector data against global threat agents.

This is not a challenge we can shelve for tomorrow. As recent headlines prove, there is no shortage of external actors intent on bypassing copyrights, security systems, and data privacy laws to line their pockets and feed their own data economies. They will not be held back by tanks and troops, but with cyber controls that balance the need to protect government, company, and citizen data with the mandate to keep our data fluid and fueling Canada’s own digital objectives.

Digital identity management is critical to striking that balance. Therefore, it is important to consider a Customer Identity and Access Management (IAM) strategy where a citizen’s unique digital identity could provide access to public and private sector accounts with personal preferences across multiple channels; an identity that could be fully verified and, along every transaction, provide authorized parties with an end-to-end view of their transactions for holistic auditing purposes. With the proper registration and identity proofing controls, that digital identity approach would dramatically streamline the way Canadians access vital services and resources. However, a solution like this would need to be user-friendly, future-proof, and aligned to best industry protocols and practices.

Data is the new commodity. So while the government must defend homegrown data against malicious outside threats, it must also strive to create a secure, silo-free, and fluid data-sharing landscape. That starts with a unified approach; one in which government agencies, large businesses, and citizens come together to align cyber strategies and march forward to the same virtual beat.
There is little question that digital payments are the way of the future. And as Canada embarks on its payment modernization, the government must ensure the fundamentals are in place, cyber postures are at their peak, and the public sector is leading by example.

It starts with the basics. For a true digital economy to take root, all Canadians must have the means and access to point, click, and pay no matter their point of origin. That access is taken for granted in major urban centres where broadband reigns supreme, yet remains lacking in remote regions and among traditionally under-serviced communities. We also assume a majority of Canadians have access to the smartphones, email capabilities, and connectivity needed to make digital payments. Herein, there is benefit in uniting telecommunication players and industry stakeholders to bring digital payment capabilities to all Canadians – even in cases and regions where there is little commercial motivation.

We cannot afford to take our security for granted either. Current e-transfer systems remain vulnerable to theft, interception, and corruption by cyber threats. As such, the government must work in tandem with banks, Payments Canada, and the Ministry of Finance to better shield our virtual borders.

Lastly, until the government stops perpetuating the use of paper cheques, we cannot expect the country to follow suit. Consider that Canada still allows cheques to be cut for $25 million while many countries have driven that value down to as low as $50,000, and one can see why Canadian players might not be motivated to invest in paper-less alternatives. Until that limit is lowered and the government demonstrates greater faith in using digital payments, the movement towards digital payments will be unambitious at best.

Access for all, world-class security, and public sector stewardship. Only when these elements are plugged in can Canada make a genuine push towards a digital economy.
Open Data

If Canada hopes to create a fair, thriving, and open data economy, it must further clarify who owns that data, how and by whom it can be used, and how best to secure it along every point of contact.

General wisdom dictates that personal information should belong to the individual about whom the information concerns. More importantly, when this information is shared with a third party – be it the government, businesses, on the internet or mobile applications – it is done with the ‘understanding’ it is being licensed out for a specific purpose. These concepts already underpin existing legislation like the Personal Information Protection and Electronic Documents Act (PIPEDA) and numerous provincial regulations. Yet, this current framework is not necessarily acknowledged or enforced in any meaningful way. At least, not enough to deter bad actors from collecting, using and abusing data as they see fit.

There are also uncertainties around whether or not data ownership changes depending on the nature and structure of data being used. Consider that commercial and industrial information can be treated as a secret, and that personal data may be aggregated to form a new asset that can be claimed as intellectual property, even if private citizens may not have provided (or were not aware they provided) consent to such secondary use. Once more, while we have somewhat adequate laws and guidelines in place for intellectual property, they are often poorly understood, communicated, and enforced.

There are several ways to move forward. One would be to re-examine our current legal framework and send a clear message that misuse of personal data comes with a price. The other is to explore frameworks, like that of the Creative Commons copyright license, to define how content can be used on a case-by-case basis in simple terms. A similar system for data would see the creation of data use certification levels (e.g. the highest of which would allow secure, trustworthy, and routinely audited organizations to collect data from any citizen for any purpose; the lowest of which would allow the bare minimum of data collection; and middle of which to collect specific information for specific purposes). Under a system like this, both organizations and citizens would have a quick and clear way to determine their data rights.

Certainly, if open data is the goal, then we need to move forward with measures that balance data economy growth with the need to respect Canadians’ rights.
Canada is fast becoming a nerve centre for emerging technologies, yet its long-term potential pivots on our ability to attract and support today’s industry pioneers, and our ability to turn pioneering research into practical businesses. This starts with tackling the most critical issues facing start-ups: access to talent, capital, and a regulatory environment that encourages growth.

The market for high tech talent is global, and is highly competitive. Countries around the world have prioritized investments in emerging technologies to drive growth. The challenge of our universities and colleges will be to produce enough graduates to fuel our progress in emerging technologies like artificial intelligence (AI), automation, and Internet of Things (IoT) innovations.

We require not only a renewed national emphasis on skills development and job creation, but measures to make Canada more competitive among its global peers. By some measures, Canada has been a leader in emerging technology research, but has not seen those efforts come to market as quickly or profusely as other jurisdictions. Measures must be taken to help tech companies take root and flourish. It needs to be easier for entrepreneurs to access start-up grants and funding, and key business resources and services. Government should take a customer centric view to build and support connected service portals to serve this community. Additional efforts should also be made to enable start-ups to become scale-ups by providing competitive access to capital and enhanced support to access export markets in a connected, client-centric manner.

Moreover, the government itself can support start-up growth by becoming a more viable marketplace. This means adopting a procurement approach whereby it tenders the problem, not the solution; often times working in partnership with vendors to fail fast in an agile solution development environment. We must also encourage a more open (and secure) data-sharing economy, by breaking down governmental silos, connecting data sets, and viewing data through a client lens.

Tied to this is a need for a more flexible regulatory framework; one which can quickly adapt to new technologies as they arise and address issues of data ownership and privacy, safety of new technology, issues around algorithm assurance, and policy issues regarding the labour force. The rate of change and adoption of new technologies is currently outpacing our ability to address the regulatory needs of these innovations. An agile approach to regulatory review within a broader framework is required, one that enables technology adoption to keep pace with the market.

Lastly, courting the tech leaders of tomorrow requires getting ahead of the 5G revolution. There is no denying 5G will re-define all aspects of our lives and enable organizations to push the boundaries in everything from AI to automation, IoT to augmented reality, and beyond. Countries that launch 5G spectrum auctions first will enable companies to own the technology and the patents and have first mover advantage. As such, Canada should consider moving up the date for a 5G spectrum auction from 2020 to 2019. Having a seat on the global stage means bringing the best start-ups to our table. And as competition for high-tech talent mounts, now is the time to make Canada a more supportive, collaborative, and opportune hub for tech industry trailblazers.
Skillset and Workforce

Canada’s workforce has much to gain from new technologies, but its ability to co-exist with robotic labour cannot be taken for granted.

Without question, artificial intelligence and automation are re-shaping what it means to work. And while this shift is freeing up new opportunities for human talent, it is also threatening to isolate Canadians who have neither skills nor maneuverability to adapt. Programs like Ontario’s (now-defunct) basic income project have surfaced to bridge that gap, but it is (or was) a small part of the solution.

As the Federal Government pushes ahead with its digital strategy, it must be cognizant of the jobs and skills that face obsolescence. A labour market that requires new or advanced skillsets is always stronger when it includes instruments or strategies that can ensure every citizen has an opportunity to participate. That includes both longtime Canadian residents and newcomers alike who may require help acclimatizing to the increasingly digital workplace.

Stronger support for education and training is also key. That is not necessarily to say the government should provide or deliver the training themselves, but instead collaborate with universities and colleges and pursue public-private partnerships with the intent to bridge the skill gaps, encourage the transfer of knowledge, endorse on-the-job skills development, and forge clearer paths to the jobs of tomorrow.

Whatever tools or resources are created to re-skill Canada’s workforce, they must be available to all. And yet, not all Canadians are connected equally. Investments in digital infrastructure are needed if we hope to create equal access to emerging resources and job opportunities.

The so-called ‘rise of the machines’ could take years to manifest, but it is coming all the same. This seismic shift can either create new opportunities for today’s workers, or a mass displacement of human talent. The outcome will hinge on Canada’s willingness to couple its digital strategy with strategies that will help all citizens survive – and more importantly, thrive – in the growing digital economy.

Soula Courlas  
Partner and National Lead, People & Change  
KPMG in Canada  
416-777-3369  
scourlas@kpmg.ca

Tracy Orr  
Director, People & Change, Management Consulting  
KPMG in Canada  
613-212-2881  
tracyorr@kpmg.ca
As Canada moves closer to its digital ambitions, the protection of personal information and privacy will take precedence. This is true for private and public sector entities alike.

Data security and privacy are not new imperatives. It is, however, one that has been underscored by growing cyber threats and landmark data initiatives to transform the way we work and interact in the new, digital world of services. The most influential reminder of this is the EU’s General Data Protection Regulation (GDPR), which holds all entities that manage European data to greater accountability and transparency standards than ever before, influencing governments around the globe to adopt similar privacy approaches.

And make no mistake: the digital future is a trust game. Organizations that set themselves apart will be those who proactively build privacy and security into new technologies, business practices, and the architecture of their emerging tech, by design and default. It will also be those who make explicit contracts with the customers about how their data is being collected, managed, and used; and those who can present a clear, and more balanced value exchange with customers for their data – be it offering incentives, better experiences, or more customized services, but not at the expense of their privacy values or expectations.

The Canadian government is not exempt from these expectations. The good news is that the Canadian Government has demonstrated that it is very serious about implementing a national data strategy built around these foundational principles. And with PIPEDA set for review, it is likely that our bar will be raised ever higher to stay in step with our European partners.

As that journey continues, we must have a full view of modern risks and Canadian attitudes.