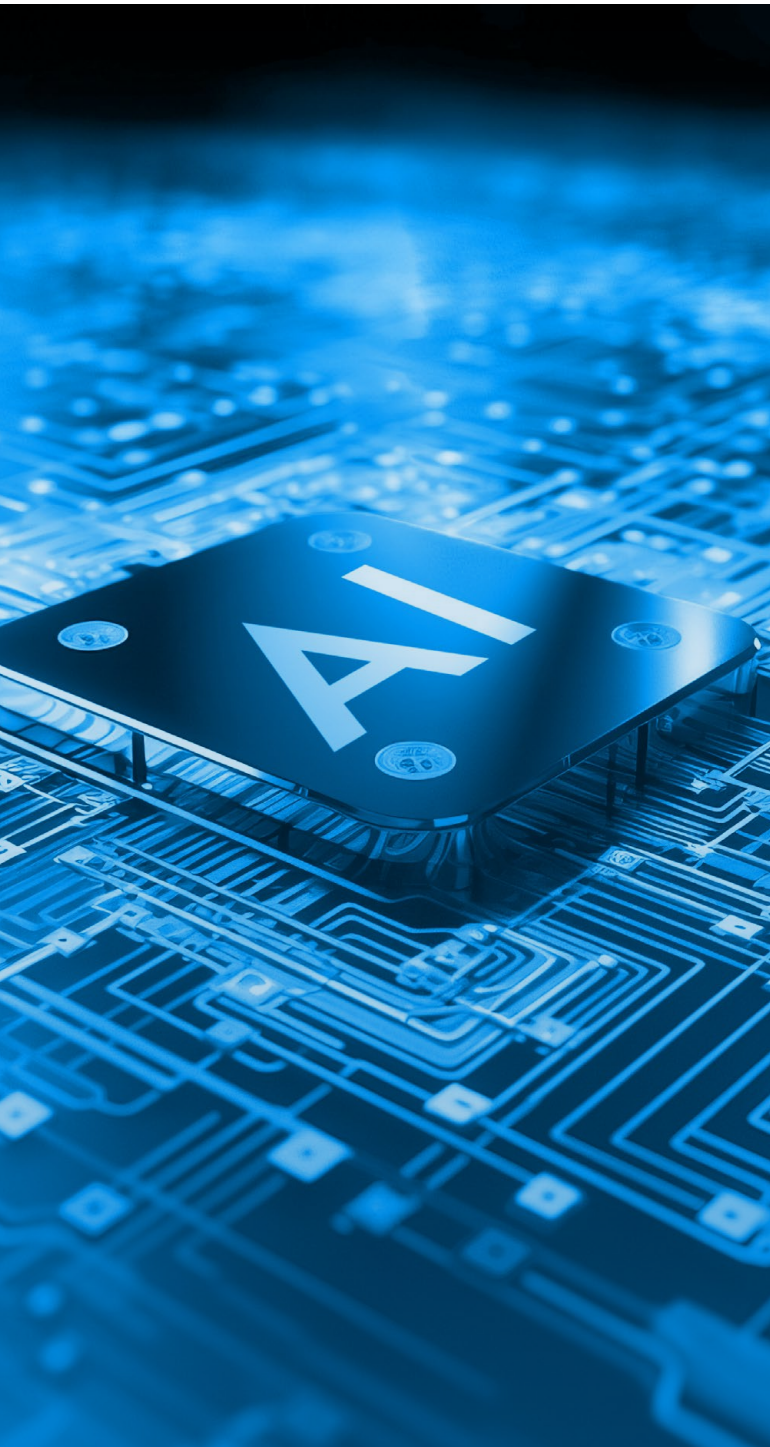CSA PUBLIC POLICY CENTRE

Ahead of the Curve: A Roadmap for Regulating Digital Technologies

December 2023

CSA Public Policy Centre

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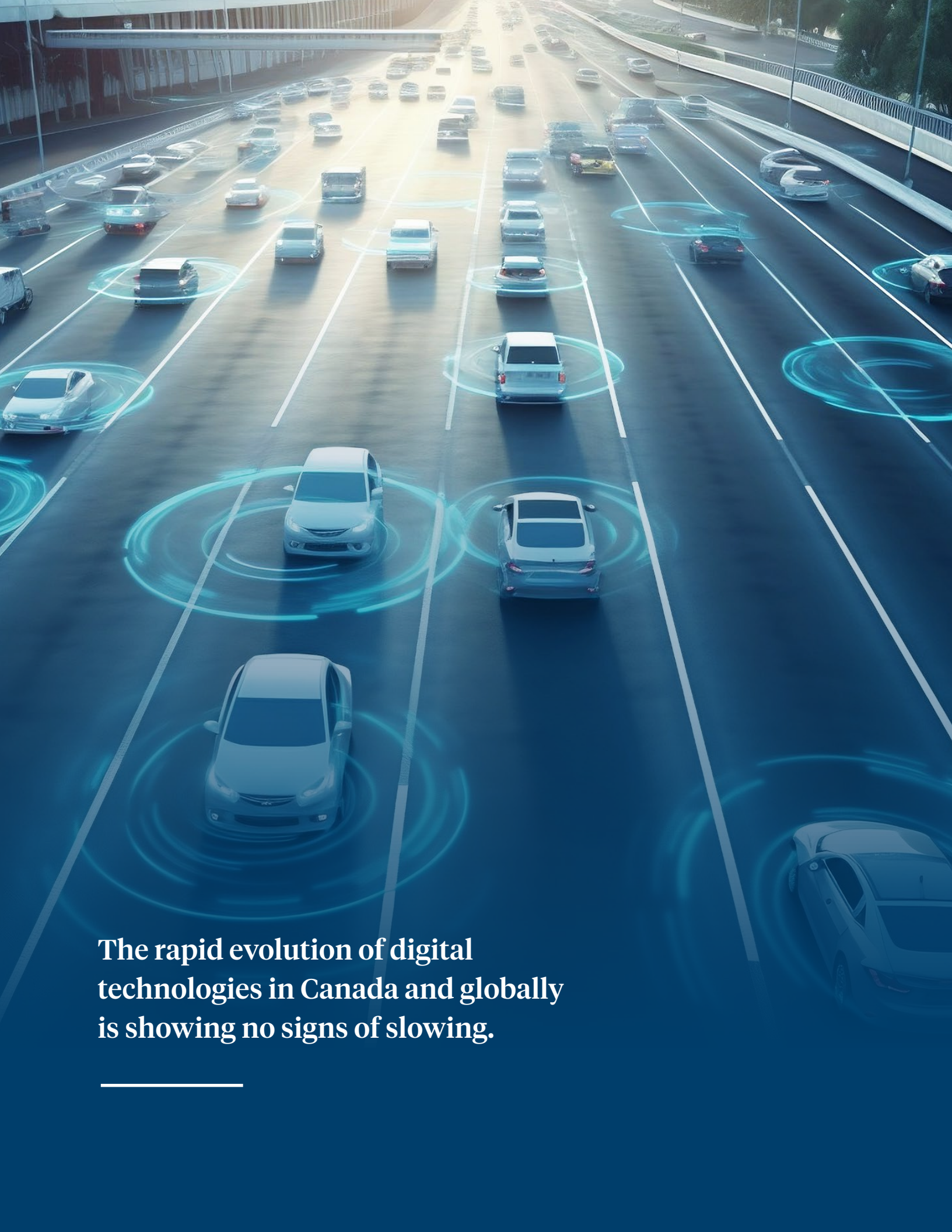
ABOUT THE DIGITAL GOVERNANCE COUNCIL

The Digital Governance Council (formerly the CIO Strategy Council) works through its members across the public and private sectors to strengthen trust in Canada's digital economy by collaboratively identifying, prioritizing and acting on digital governance opportunities and challenges.

Acknowledgements

The rapid evolution of digital technologies in Canada and globally is showing no signs of slowing.

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Introduction

The rapid evolution of digital technologies in Canada and globally is showing no signs of slowing. Public attention has recently been captured by the advances of large language models such as ChatGPT, which give the impression of mastering sophisticated writing and conversational tasks. Other artificial intelligence (AI), digital, and advanced robotics applications, ranging from autonomous vehicles to eldercare robots to social media apps like TikTok, continue to pose questions to policymakers as these digital technologies reshape the way Canadians live, work, and socialize.

New technologies can provide real benefits to Canadians and offer solutions to social and economic challenges. Desirable new consumer products, ground-breaking medical discoveries, and solutions to the climate crisis are possible when innovation is encouraged. At the same time, however, digital technologies take regulators into uncharted territory—and the speed at which these technologies are emerging has created a sense of urgency for needed intervention.

In March 2023, several prominent digital technologists and experts called for a pause on the development of AI systems in order to give developers, policymakers and regulatory authorities time to catch up, understand, and act to effectively govern the technology. The unforeseen impacts of digital technologies can potentially be significant and irreversible. However, traditional approaches to rulemaking are not well-suited to the digital age and have been slow to protect the interests of Canadians, particularly children and under-represented populations.

Digital technologies disrupt conventional product development and usher in unpredictable behaviours, applications, and impacts at a novel scale and speed. Traditional approaches to review and regulation move

New technologies can provide real benefits to Canadians and offer solutions to social and economic challenges. Desirable new consumer products, ground-breaking medical discoveries, and solutions to the climate crisis are possible when innovation is encouraged.

much more slowly. For regulators to meaningfully mitigate the challenges associated with digital technologies, while leveraging their opportunities, a broader approach to action – beyond traditional regulation – should be considered. Traditional regulatory frameworks should be reimagined to be flexible, proactive, and innovative and complemented by other approaches such as investments in public sector capacity and standards-based solutions.

This report provides an overview of what a reimagined approach could look like in practice. The first section explores three case studies of relevant digital technologies (generative AI, 3D printing, and blockchain) as a means of highlighting some of the common issues that digital technologies raise for policymakers and regulators—ranging from the blurring of jurisdictional boundaries to consumer safety concerns.

In the context of these challenges, the second section offers potential policy pathways for more effective approaches to regulation of digital technologies in Canada. Governments should consider a multi-faceted approach that includes:

- enhancing existing approaches by establishing core principles, shifting from reactive to proactive approaches, and developing strategies to put people first in a data-rich world.

- investing in the public sector by improving intergovernmental cooperation, enhancing skills, capacity, and knowledge, and establishing a Digital Centre of Excellence.

- using complementary tools such as risk-based approaches (e.g., certifications, audits, and inspections), standards-based solutions, and legal frameworks.

The Regulatory Challenges of Digital Technology

Digital technologies encompass a broad range of applications and innovations, from computer hardware and software to the internet and social media to artificial intelligence, amongst others. Some of these applications and innovations can be addressed by existing regulatory structures. This paper focuses on novel applications and innovations in the digital realm that do not conform to the characteristics identified and monitored by current regulatory structures, particularly those that disrupt, or have the potential to disrupt, existing norms, behaviours, and markets at scale. This section presents three case studies of such digital technologies: Generative AI, 3D printing, and blockchain, providing a brief overview of the technology itself, its potential consequences for Canada's society, economy, and environment, and implications for policymakers. These case studies highlight the complexity and breadth of issues that disruptive digital technologies bring to the table.

01

Case Study

Generative AI

What is Generative AI?

Generative Artificial Intelligence (AI) is digital technology that produces content such as text, audio, images, and videos based on user prompts.[1] The earliest AI concepts appeared in the 1950s. Advances in computing power and machine learning algorithms in the 1990s and 2000s helped to set the stage for rapid development of deep learning models over the past 15 years, which in turn set the stage for the recent advances in generative AI. Now, its applications are numerous, ranging from generating code with GitHub Copilot, to creating realistic images using platforms like DALL-E. These AI systems generate content that mimics characteristics of human-generated content at accelerated rates, opening avenues for efficiency and creativity in diverse sectors.[2] The technology uses data to identify patterns, and therefore the quality of its outputs improves with the quality and quantity of data that it receives.

Beyond content generation, the deployment of generative AI holds the potential to revolutionize fields by identifying patterns and solutions at speeds that are beyond human capacity.[3]

What are the potential consequences?

The role of data is integral to the development and use of generative AI. However, there is a lack of clarity in how existing frameworks governing data privacy and intellectual property rights apply to the development and use of AI, necessitating an overhaul of legislative measures.[4] The scope of this challenge is immense, with generative AI impacting a wide range of industries, from software development to music and photography, as well as the personal privacy and cybersecurity of individuals whose data is mined and used (with or without their permission or compensation). The blurring of jurisdictional responsibilities adds to the regulatory complexity—with unclear responsibilities between federal and provincial governments in Canada[5] and the global nature of the internet that intersects with regional regulations—thus creating potential conflicts and exploitable loopholes.[6]
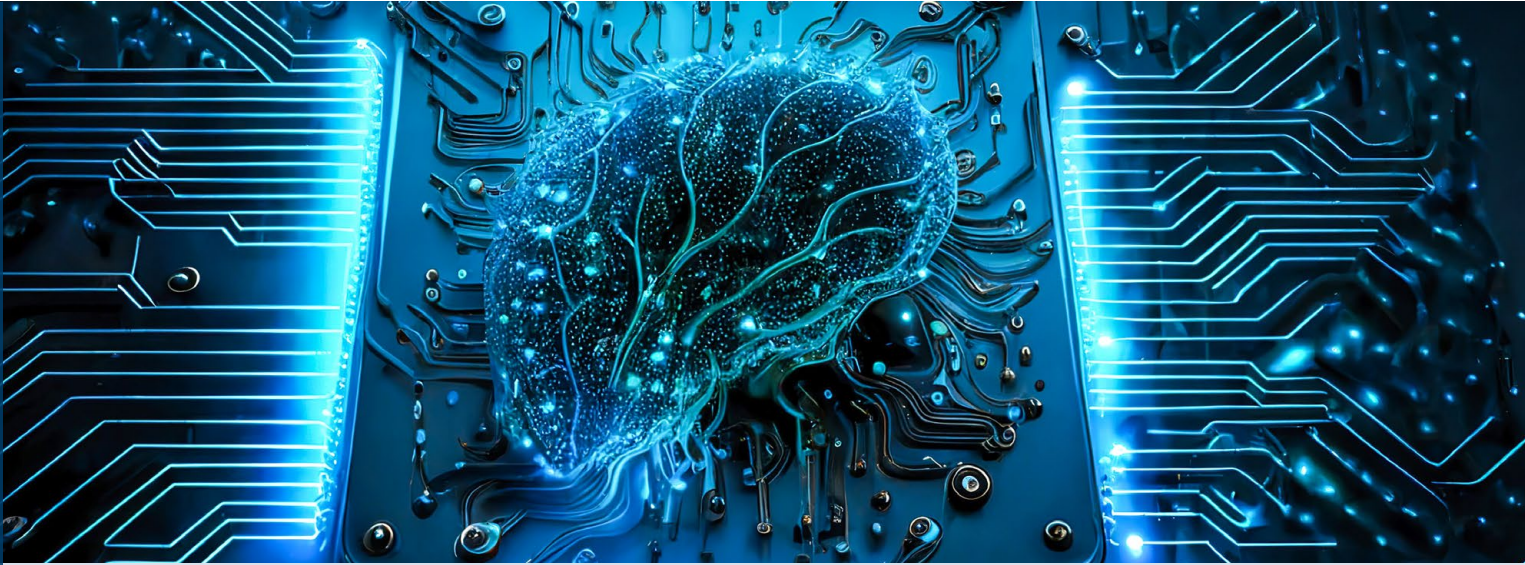
01

Case Study

The deployment of generative AI holds the potential to revolutionize fields by identifying patterns and solutions at speeds that are beyond human capacity.

Beyond the challenges to data privacy, "deepfakes" (e.g., using this technology to manipulate images, audio, or video) have been used to create false narratives and fraudulent content, exacerbate the spread of misinformation, and foster criminal activities.[7] The European Union Agency for Law Enforcement Cooperation has identified this facet of AI as a growing concern, warning that generative AI fuels online harassment, extortion, fraud, social unrest, and political polarization.[8]

And finally, while there are examples of AI that can support the quest for solutions to climate change, the technology's high energy use is a concern.[9] According to numerous assessments, information and communications technologies are currently responsible for approximately 3% of worldwide greenhouse gas emissions.[10] As the development and application of AI escalates, the energy demands for operating and training its extensive language models are projected to rise,[11] compromising national and international efforts to mitigate climate change.

What does this mean for regulatory efforts?

The complexity of generative AI, its ability to disrupt countless industries, the global nature of its development, and growing concerns for its impact on the public, has left governments around the world struggling to respond.

The rapid pace of AI innovation in particular has led to a "regulatory lag" as policymakers struggle to keep up with the evolving landscape.[12] This lag highlights how the absence of proactive and effective rules creates space for unforeseen, and potentially negative, consequences to emerge. This has been further exacerbated by the monopolistic behaviours exhibited by a few tech giants, which further strain the efforts to introduce and enforce equitable policies.[13]

Stringent data protection laws, such as the General Data Protection Regulation (GDPR) in the European Union, have been introduced to mitigate threats to personal privacy and data security and promote greater transparency and control over personal data.[14] Given the global nature of AI, collaboration and partnerships are being explored to develop and harmonize standards to guide AI's responsible use.[15]

02

Case Study

3D Printing

What is 3D printing?

3D printing, or additive manufacturing, is a process in which an object is built from the base up by adding one layer of material at a time.[16] It differs from traditional, or subtractive, manufacturing, where objects are made by removing material from a larger block.[17] 3D-printed objects are created by a computer-aided design using a digital scan of an object to guide a physical 3D printer that builds the object layer by layer.[18] 3D printers use materials such as metals, polymers, ceramics, foams, gels, or biomaterials to create the objects.

In its current form, 3D printing excels in spaces that require small volumes of customized objects, such as prototypes, biomedical devices and prosthetics, specialty car parts, and aerospace engineering.[19] As the technology becomes more efficient and affordable, additive manufacturing will allow for decentralized production of all kinds of products. Further, digital designs can be distributed around the world so that goods are produced locally and in small quantities.[20]

What are the potential consequences?

As an advanced method of manufacturing, 3D printing can accelerate innovation and improve productivity as fewer labour hours are needed to take a product idea to production. However, mass adoption could change the type of labour required to produce and transport items (e.g., there could be an increase in demand for designers and computer scientists).[21] The process and on-demand nature of additive manufacturing reduces production waste and eliminates the need for storage of excess inventory.[22] This, alongside the reduction in transportation-related emissions due to local manufacturing,[23] will likely make 3D printing a more sustainable manufacturing process.

However, 3D printing disrupts existing legal and regulatory frameworks that oversee phases of manufacturing from design to product safety and poses potential risks to public health and

3D printing disrupts existing legal and regulatory frameworks that oversee phases of manufacturing from design to product safety and poses potential risks to public health and safety.

safety—particularly as consumer access to 3D printing technology increases. Decentralization and customization could make it difficult for regulators to ensure adherence to product standards as 3D printing increases both the number of manufacturers and the number of products, weakening oversight of consumer product safety.[24] There have also been concerns regarding the ability of consumers to create dangerous products (e.g., weapons),[25] as well as health and safety issues associated with using the technology itself (e.g., exposure to hazardous materials).[26]

Further, the decentralized nature of 3D printing, coupled with digital scanning capabilities, disrupts Intellectual Property (IP) rights by making it easier to manufacture counterfeit products and harder to enforce patent, trademark, industrial design, and copyright laws.[27]

02

Case Study
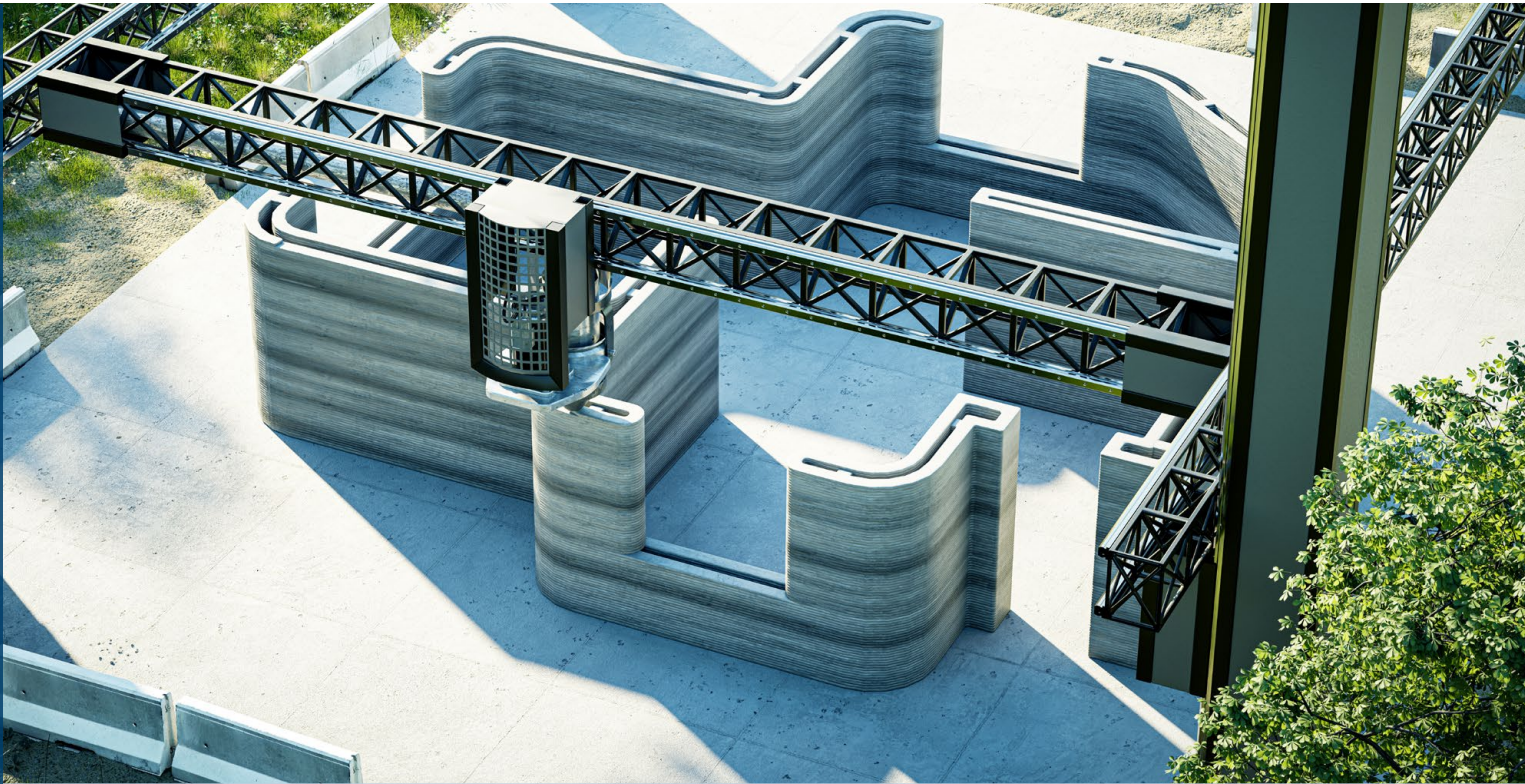
What does this mean for regulatory efforts?

Given the breadth of products that can be manufactured using 3D printing, the implications of this technology extend across economic sectors and regions. 3D printing can be used to create endless consumer and industrial products — products which are currently created and brought to market under a host of rules and regulations written before autonomous, decentralized production was possible. Reproducing a designer shoe will have implications for the IP owner of the original product, whereas reproduction of items related to food, customized medical devices, or automotive parts are tightly regulated for quality assurance and safety — and products generated by 3D printing may not meet these standards.

Legal and regulatory frameworks across all industries must be reviewed to take both broad access and consumer access to 3D printers into consideration. While jurisdictional responsibility is clear in some cases — intellectual property, for example, is a federal responsibility — other areas such are consumer protection are subject to shared responsibilities between federal and provincial/ territorial governments.

Across all jurisdictions, governments will face difficulty with ensuring regulatory compliance as 3D printing democratizes and decentralizes the manufacture of goods. Enforcement of both IP and consumer protection laws is typically more reactive in nature — often initiated by lawsuits or consumer complaints — which could become increasingly challenging if consumers can use these devices to replicate or create products in their homes. When these products pose significant public health and safety risks, the urgency to act is heightened.[28]

Where further regulatory efforts are necessary, it will be important to approach them by prioritizing consumer and product safety, while also balancing incentives to innovate with consumer access.[29]

Blockchain and other distributed ledger technologies form the basis of several digital technologies—most notably cryptocurrencies, where blockchains form the ledger and verification system for all transactions.
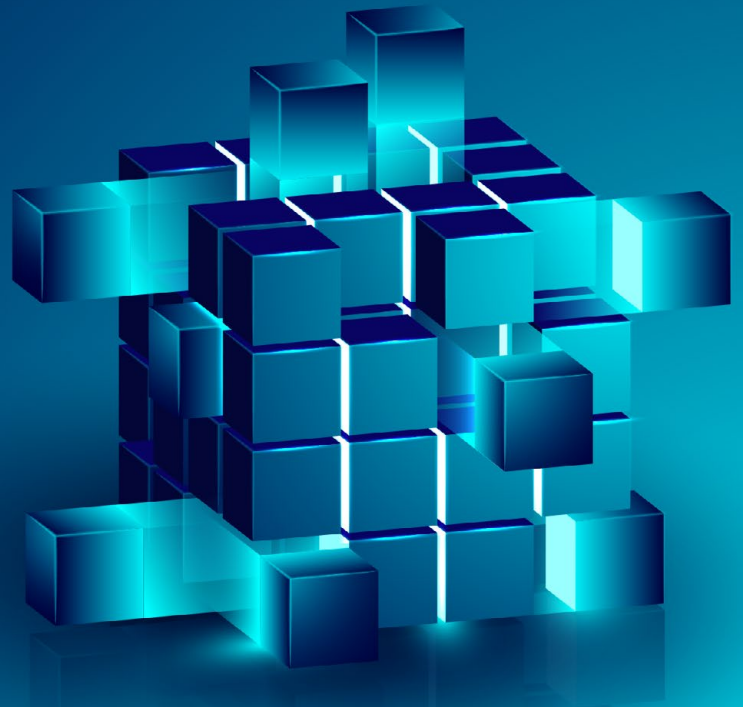
Blockchain

What is blockchain?

Blockchains are a decentralized digital ledger technology—they record transaction data across a peer-to-peer network without a designated authority responsible for approving the transactions.[30] Since ownership of the transaction data is distributed amongst participants—each computer in the network has a copy—and information cannot be deleted, blockchains establish shared ledgers that maintain a reliable and verified record of every transaction that has occurred on the network.[31]

Applications of blockchain feature direct transactions among individuals and organizations, establishing unchangeable communal records.[32] Industries that benefit from these applications include finance, logistics, and government services. Blockchain and other distributed ledger technologies also form the basis of several digital technologies—most notably cryptocurrencies, where blockchains form the ledger and verification system for all transactions.

What are the potential consequences?

The decentralized nature of blockchain allows many participants to access the ledger and process transactions irrespective of whether an affected participant can access the transactions while they are being processed, creating a new avenue for cyberattacks.[33] Blockchains' immutable ledgers raise privacy concerns because information related to every transaction that has been processed is permanently saved, which is particularly concerning for personal and other sensitive information—it cannot be deleted when detected and/or no longer needed.[34]

The application of blockchain technology in cryptocurrencies creates its own challenges. Volatility across crypto assets and their activities has raised significant concerns regarding market integrity and consumer protection. Between early 2020 and November 2021, market capitalization of cryptocurrencies grew tenfold and came to represent 1% of global financial assets (US$2.6 trillion).[35] While this figure has since fallen, the

Regulation of cryptocurrencies should consider the uniqueness of digital assets and the platforms used to exchange them.

rapid growth and tumultuous declines in a market that consists mostly of unbacked assets (i.e., without intrinsic value) has generated concerns regarding financial stability around the world.[36]

As an industry that is unknown territory for most consumers, this leaves many individuals vulnerable to scams and manipulation. Between January 2021 and March 2022, the US Federal Trade Commission reported that consumers lost over $1 billion from fraud related to cryptocurrencies.[37] Younger consumers are more than three times as likely as older consumers to experience losses, with those in their 30s being hardest hit.[38]

In addition to regulatory oversight, blockchains require significant amounts of energy given the amount of information that needs to be processed for each transaction. Bitcoin, one of the most energy intensive blockchains, uses the same amount of energy per transaction as VISA would use for almost 2 billion transactions.[39] In Canada, provincial utilities have begun suspending service to cryptocurrency operations given "overwhelming energy demands and low economic return."[40]

What does this mean for regulatory efforts?

There are many benefits to blockchain technologies, despite their challenges. However, decentralization— the driving principle behind blockchain technologies— makes regulation difficult. There have been growing calls from regulators around the world to address

cryptocurrencies, although these digital assets are not bound by borders and transactions are facilitated online. This is in stark contrast to the existing structure and authority of central banks and domestic banking regulation in countries like Canada.[41]

Regulation of cryptocurrencies should consider the uniqueness of digital assets and the platforms used to exchange them. There have been ongoing conversations about whether crypto assets are securities and therefore should be regulated as such. The US is still trying to answer this question.[42] While the Canadian Securities Administrators has provided guidance around when securities law may apply to cryptocurrencies,[43] securities regulation falls under provincial jurisdiction and some regulatory agencies have expressed concerns about the ability to enforce existing rules.[44] Some have suggested the need for a new framework, rather than incorporating crypto assets into existing regulations that are ill-suited to address the unique challenges and opportunities they introduce.[45]

The EU has taken the most significant steps toward creating a holistic approach to considering cryptocurrencies with its Markets in Crypto-Assets (MiCA) regulation. MiCA attempts to address many of the issues identified—consumer protection, accountability for crypto companies, and prevention of illegal activity such as money laundering, as well as limiting environmental impacts.

A Path Forward: More Effective Regulatory Approaches

As the case studies have highlighted, there are several characteristics of digital technologies that challenge traditional regulatory approaches, which include:

- the rapid speed and scale of innovation
- opportunities for monopolistic behaviours to emerge
- lack of legal clarity arising from new business models and approaches
- blurred jurisdictional accountability, both domestically and internationally
- a range of privacy and security issues arising from the unique role of data
- challenges protecting the public interest and anticipating issues

Current regulatory and legislative frameworks are designed for steady-state affairs, thorough engagement and research, and long periods between updates. They are not keeping pace with the evolving challenges of digital technology.

The regulatory model for digital technologies should start with core principles and an operating framework to guide decisions. The model should include a thorough and ongoing approach to risk-assessment, an array of policy and regulatory instruments fit to specific tasks, and up-to-date skills and competencies for policymakers and regulators.

Some specific areas that merit consideration and hold potential are discussed below, and can be categorized into three types of strategies:

- Enhancing existing approaches
- Public sector collaboration and investment
- Using complementary tools

Enhancing Existing Approaches

Maintain Core Values Through a Principles-based Approach

One of the key challenges disruptive digital technologies present to policymakers and regulators is assessing how to uphold core values—e.g., public interest, consumer protection, product safety, or corporate and fiscal integrity—while supporting the drive for a vibrant society and economy. Permissive regulatory approaches foster innovation and competition; precautionary approaches protect public welfare or safety.

The recent experiences of cryptocurrencies are an example of an emergent technology that has been relatively lightly regulated, and in a patchwork fashion, across North America. In the wake of significant volatility throughout 2021 and 2022 and the collapse of FTX and QuadrigaCX, there have been renewed calls for tighter regulatory action in the space.[46] At the same time, balancing the interests of different stakeholder groups can prove challenging when decisions need to be taken quickly and traditional consultations are time-consuming and may not yield a clear consensus.

Policymakers should seek to establish a strategic operating framework that supports key questions about objectives and values related to government's role in the economy and society more broadly.[47] These could include:

▪ What are the impacts of regulatory decisions on broader policy objectives such as equity, accessibility, and longer-term issues (e.g., tax revenue for fiscal health)? How can strategic foresight (e.g., exercises conducted with impacted stakeholders that model various potential futures and test potential actions against each of those scenarios) be used to reduce the risks of unforeseen issues emerging?

▪ What is the role of the government in the market? Is there a prospect of effective and transparent self-regulatory action from new actors, or of the market correcting itself? Could this prospect be encouraged through measures short of regulatory action, such as transparency measures that would inform the public's ability to make more informed decisions?

▪ How can holistic approaches to risk-assessment, which consider different values that could be impacted by new technologies, be utilized efficiently? For example, if climate change action is a key policy value, would regulatory action or a hands-off approach best ensure progress toward that action? Does that progress mitigate potential harms to consumer welfare or existing stakeholders' interests?

▪ Are there red-line uses of digital technologies that should not be permitted (e.g., predictive policing, use of health data to determine insurance coverage, the manufacture of certain products)?

Ultimately, Canada must adopt a careful and critical approach to digital technology innovation that optimizes benefits while minimizing harms and ensuring safety. It is important to leverage feedback and data from affected groups in real time and to consider risks based on a multi-dimensional analysis of the values at play and trade-offs at stake. Doing so requires a clearly articulated set of principles that guide specific decisions and regulatory/policy responses.

Shifting from Reactive to Proactive Approaches

There is merit in exploring efforts to adopt proactive regulatory approaches that set parameters for disruptive technologies in real-time, rather than waiting for market entry and consequences to play out, which may be impossible to undo. The State of California's iterative approach to autonomous vehicle regulations is a recent example of a continuous, evolving process of provisional rule-setting, pilot programs, evidence-gathering and adjustments that could serve as a model for regulators.[48]

The Ontario Securities Commission and Canadian Securities Administrators have also trialled the concept of regulatory sandboxes that feature faster approvals for fintech firms to test products on a time-limited basis in recent years.[49] These models work best when guided by a core set of operating principles that inform and shape which types of relief or assistance are provided to innovative firms; and ensure that guardrails are in place to protect the public interest, whether investors or other interested parties. Sandboxes and pilots offer the key benefit of providing evidence of market impacts without committing to a long-term regulatory approval process made without sufficient evidence. Being prepared to re-write or adjust provisional rules quickly based on new data and information, is a core element of the type of iterative policymaking that is necessary in a rapidly changing environment. Work is underway to develop a national standard to mobilize knowledge and scale these approaches across the country.[50]

Proactive strategies may benefit from taking precautionary or rights-based approaches when it comes to protecting the public interest from potential harms related to new technologies. For example, the rise of direct-to-consumer genetic testing is not currently prohibited, but the *Genetic Non-*

The collection of vast amounts of data from individuals raises questions around personal privacy and informed consent.

Discrimination Act protects consumers from the risk of potential discrimination from private health insurers due to inferred implications of genetic testing.[51] Taking a similar approach to updating the *Competition Act* to include additional triggers and greater thresholds for approving merger reviews could help alleviate anti-competitive tendencies of digital firms and support a flourishing innovation marketplace.

Adopt a People-first Approach in a Data-rich World

The role of data in the business models of digital firms is unique: rather than a by-product of its operations, data is a key asset in and of itself and, in some cases, the end goal. Analysis has shown that the role of data in digital firms can exacerbate existing competition issues – for example, data enables more sophisticated forms of gatekeeping, self-preferencing and copying. Digital firms collect vast amounts of data, and when data is proprietary and access is exclusive to the firm, this provides a competitive advantage — allowing a head start to the development of new technologies, the replication of existing popular products, and introduces significant barriers for new market entrants.[52]

Further, mergers of dominant digital firms can create a strong data holding that introduces barriers to entry for all other firms in each market and can play an important role in "killer acquisitions" in which a firm acquires

competitors to eliminate competition.[53] The role of data also introduces new challenges to competition law, as existing frameworks are likely insufficient where data is considered the primary currency.[54]

The collection of vast amounts of data from individuals raises questions around personal privacy and informed consent. Data is being constantly collected through use of technology in everyday life with limited public understanding of how that data is used. While consumers are often unhappy with data collection practices, there is a feeling of powerlessness and "resignation" that personal data will be collected without meaningful consent.[55] These practices also have an outsized impact on marginalized communities by exacerbating existing structural inequity — an issue that the US Department of Commerce has recently initiated an investigation into.[56] Further, the role of data in perpetuating digital monopolies directly harms consumers and workers.[57]

For regulators, an increased focus on data portability — enabling users to access, manage, and transfer personal information that is collected from the digital firms they engage with is crucial. The concept of data portability can empower consumers by providing them greater control over their data and avoid being locked into a relationship with any particular digital firm.[58] While data portability requirements impose stricter rules on digital firms around the collection and management of

user data, it can also benefit new market entrants and encourage innovation.[59] Data portability is included as a key principle within Canada's Digital Charter and is proposed in Canada's new privacy legislation.[60]

The digital literacy of Canadians will always lag industry changes. The extent to which consumers, users, and providers of data understand relevant privacy, security, safety, and misinformation risks, can help mitigate imbalances fuelled by digital platforms.[61] Regulators have, for example, recently focused on highlighting the volatile and risky nature of cryptocurrencies for investors.[62] Meanwhile, the Competition Bureau has released a number of publications aimed at educating consumers about fake online reviews, third-party online resellers, and subscriptions.[63] While these efforts are important, they should not be viewed as replacements for, but rather supplements to, efforts at broader regulatory and legislative action that rebalances the informational and power asymmetries in a digital world.

Public Sector Collaboration and Investment

Inter-governmental Cooperation

As a smaller market, Canada needs to be actively engaged in international and multi-lateral efforts to regulate digital technologies. The International Grand Committee on Big Data, Privacy and Democracy is one recent effort to bring together parliamentarians from several countries to discuss and explore topics of common concern.[64] The OECD and G20 have had success in gaining consensus and translating that agreement into action on the tax implications of the digital economy through the Base Erosion and Profit Shifting Project.[65]

Canadian policymakers should also continue to explore opportunities to align domestic legislation with emerging consensus and regulatory efforts in leading jurisdictions where possible. Several elements of the proposed *Digital Charter Implementation Act* are, for example, consistent with the European Union's General Data Protection Regulation (GDPR). Consistency with existing international regulatory frameworks, where they are aligned with Canada's policy objectives, makes compliance and enforcement efforts more likely to succeed.

Where possible, Canada should also promote compatibility and interoperability of products, processes and regulatory approaches, by leveraging standards, trade agreements, and international fora. Organizations such as the International Organization for Standardization (ISO) and OECD provide a venue and important thought-leadership opportunities in this regard, as well as accredited Standards Development Organizations in Canada.

Domestically, there are opportunities for Canadian governments to establish standing political intergovernmental bodies that could flag issues and coordinate responses across all three levels of government, in areas like regulation of autonomous vehicles and the emerging world of generative AI. Closer intergovernmental partnerships would reduce the risks of unintended consequences stemming from one government acting alone and provide greater regulatory certainty for businesses and consumers.

Enhancing Public Sector Skills, Capacity, and Knowledge

Policymakers must fund the capacity and skills development of public sector staff to anticipate, understand, and develop enforceable policies and regulations. The United States has, to good effect, used programs such as the Presidential Innovation Fellows to bring technologists and engineers into government agencies for time-limited secondments that leverage their technical and digital expertise to improve public sector digital expertise.[66]

Canada and Ontario have both introduced Digital Service teams within the past decade to focus on digital service delivery efforts in a cross-government manner. In a similar vein, Canada's rapid development of the COVID Alert app was largely accomplished through the efforts of developers from private sector firms, Blackberry and Shopify. Taking such approaches from the digital service delivery realm and adapting them to a policymaking and regulatory function could take the form of secondments from the private sector into key departments charged with oversight, or more formal, long-term recruitment efforts designed to bring individuals with industry expertise into government to work with regulators.

If the benefits and challenges presented by digital technologies are in fact fundamental to the future of society, then regulators cannot be expected to operate on tight budgets to undertake the critical collaboration, analysis, and research work needed to achieve optimal outcomes that balance innovation with the protection of the public interest.

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One key challenge for governments using secondments is the loss of specialized talent to higher-paying private sector roles, which contributes to a reliance on consultants to supplement talent gaps. Developing a more comprehensive talent strategy that details where and how consultants should be leveraged must be a priority, as should developing competitive compensation for in-house staff.

Boosting training budgets to ensure policymakers and regulators have knowledge of digital technologies is critical. Equally important, is the need to expand efforts to incorporate foresight methodologies and inclusive, broad consultation approaches such as design labs into the policymaking process — as Policy Horizons Canada has effectively done at the federal level. Rapid deployment of special project teams from a variety of departments, and where necessary, different levels of government, could also help ensure that policymakers aren't caught off guard or developing siloed responses to emerging issues.

If the benefits and challenges presented by digital technologies are in fact fundamental to the future of society, then regulators cannot be expected to operate on tight budgets to undertake the critical collaboration, analysis, and research work needed to achieve optimal outcomes that balance innovation with the protection of the public interest. Canada must invest in high-quality work to achieve high-quality regulatory frameworks.

Create a Digital Centre of Excellence

Given the multitude of issues and challenges posed by digital technologies and how these technologies cut across traditional jurisdictional boundaries, Canadian policymakers may wish to establish a Digital Centre of Excellence. Such a centre could be the place to develop expertise relevant to a range of digital technologies, hire and recruit staff from private firms, develop policy positions that cut across departmental and governmental mandates, and issue recommendations for governments at all levels to consider.

This approach could not only inform regulatory responses and frameworks but also lay the groundwork for better cooperation among governments on digital service delivery issues in areas such as healthcare and social services. Depoliticizing digital issues and

providing a longer-term outlook on opportunities and risks could ease the way for a more stable, forward-looking, and evidence-based approach to some of the issues outlined in this report.

Complementary Tools

Adopt Risk-Based Approaches: Certifications, Audits, and Inspections

The risks associated with different technologies vary greatly—a chat-bot designed to assist with customer complaints about telecom service downtimes is not as consequential as an algorithm used by Crown counsel in determining sentencing recommendations. Where human health, safety, and liberty issues are at play, a higher bar ought to be in place before the deployment of an algorithm that would remove or reduce the discretion of a decision-maker or service-provider.

The Government of Canada's Algorithmic Impact Assessment (AIA) Tool provides a model of the types of questions and issues that should be considered for AI technology.[67] It is a mandatory risk assessment of the impact level of automated decision systems for all Canadian government departments.

In other cases, pre-market approvals and inspections of digital technologies should be considered in much the same way that drugs and medical devices require a thorough assessment prior to market entry. What types of audits can be developed to better understand the risks posed by algorithms? Emerging practices suggest that relevant factors to consider include understanding the inner workings of algorithms, their outputs, the datasets they are trained on, and reviewing their transparency and how explainable they are.

Undertaking these audits, not just pre-market entry but also on a regular, ongoing basis to capture any evolving issues will also be vital. Certifying technologies through a standards-based process, informed by a range of stakeholders, could provide meaningful assurance as to which products and services can be trusted in a rapidly evolving marketplace.

Enhanced transparency around the use of AI is also a potential means of enhancing trust and stemming disinformation and misinformation. The United States'
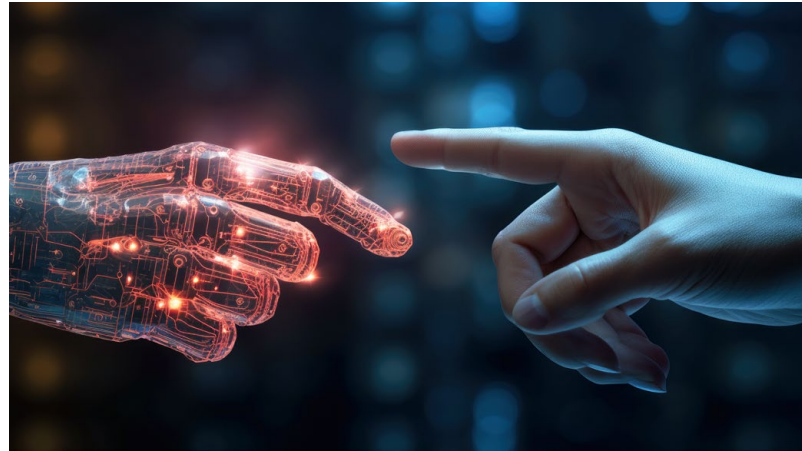
Federal Election Commission is looking at ways to halt the flow of AI-generated deepfake ads in the run-up to the 2024 presidential election. One advocacy group has proposed clear disclosures around the use of AI technology that mischaracterizes the views of a political opponent rather than an outright ban.[68]

Consider a Role for Standards

Canadian policymakers and regulators should consider which levers in their toolboxes are better suited to addressing digital challenges that are outside the current regulatory framework. Standards development evolves with industry expertise, providing a flexible approach to managing the risks and opportunities of digital technologies by elevating best practices. The incremental, iterative, and collaborative approach offered by standards is well-suited to technologies with uncertain impacts.[69]

Standards play an important role in providing the blueprint to legislative compliance, as they are initially voluntary and may become mandatory when incorporated by reference in regulations or when Ministers are granted powers to recognize standards.[70] However, regulatory review of referenced standards is time-consuming and may not keep pace with digital innovation. Proposed changes to Bill S-6, federal legislation aimed at regulatory modernization, reveal the shortcomings of this approach, addressing only a handful of acts referencing outdated standards.[71] In contrast, enabling legislation such as Bill C-27 bestows powers on the federal Privacy Commissioner to recognize codes of practice and certification programs for organizations, ensuring a flexible approach is available for organizations to demonstrate compliance under the *Consumer Privacy Protection Act.*[72]

Other approaches can be used to supplement the role of standards, such as codes and certification programs that promote minimum requirements or best practices (e.g., Natural Resources Canada's Energy Star labelling program) through either voluntary participation or adoption into legislation.[73] For example, the federal government recently introduced a voluntary code of practice for generative AI that provides guidance to companies that use or develop such systems.[74] The code is intended to serve as an interim step that could be augmented or replaced by formal regulation in the future as part of the Artificial Intelligence and Data Act legislative framework.

The international standards development community has developed, and is in the process of developing, a broad range of standards around issues such as data quality, certification of AI systems and defining the different types of AI systems.[75] These efforts will become increasingly important as AI becomes more prevalent and the cross-border common understanding and treatment of language, issues, definitions, and approaches becomes crucial to underpin joint regulatory and industry approaches. Standards-development processes that, in advance, consider issues around ethics, safety, and privacy can help reduce downstream risks to consumers. These potential benefits require standards that are developed with a diversity of stakeholders, including consumer and broader public interest groups as well as social scientists and regulators.

Standards can play a key role in augmenting regulation by providing a means of demonstrating compliance with desired outcomes. If companies can prove through certification or compliance testing that they can achieve an intended outcome, then regulators need not go as far through formal regulatory action as they might have otherwise. International standards can also facilitate interoperability, reducing transaction costs for both consumers and industry.

Leverage Legal Frameworks

General product liability claims through tort or contract law principles could serve as an effective discipline in the market to preclude or check negligent behaviour. However, these types of claims require willing litigants who will step up after harm has been done, are time-consuming and costly, and don't provide forward-looking guidance for industry or consumers and citizens.

Liability for third-party content on platforms is approached differently across jurisdictions. In China and Thailand, for example, platforms face strict liability regimes that hold companies responsible for third-party content.[76] Conversely, Section 230 of the *Communications Decency Act* in the US provides broad immunity to companies for the content on their platforms.[77]

Conditional liability sits between these two approaches, providing immunity to platforms so long as they follow specific procedures—for example, requiring platforms to remove content upon being notified of an infringement.[78] In Canada, the federal government has brought forward proposals that generally take a conditional liability approach.[79] However, international agreements can include provisions that limit the federal government's policy options—for example, Article 19.17 of the Canada-US-Mexico Agreement (CUSMA) imports s.230(c) of the *US Communication Decency Act,* which limits online platform liability on the content posted by their users.[80,81]

While the federal government has committed to protecting Canadians against harmful online content, there is not a legal framework in place yet.[82] Following consultations on a proposed approach in 2021, the Department of Canadian Heritage announced it was restarting the process after significant concerns were expressed from stakeholders, such as the potential for over-removing content and the impact that could have on marginalized groups.[83]

There are open questions about the extent to which generative AI technology will upend existing copyright and IP regimes. Inventors are seeking to name AI as authors and inventors in copyright and patent cases.[84,85]

Meta and ChatGPT are being sued in US District Court over claims of copyright infringement stemming from their large language models being trained on "shadow library" websites with illegal copies of published material that essentially steal the work of authors.[86] These thorny legal questions provoke deep unknowns, and it remains to be seen how this will unleash or restrict future innovations.

Conclusion

Digital technologies are ubiquitous, and Canadians can only expect their reach and impact on their lives to grow in the years to come. Ensuring that the benefits of these technologies are seized while their potential downsides, ranging from the spread of misinformation to heightening of bias, are identified and addressed is no easy feat. The speed with which these technologies can emerge and proliferate, their unforeseen and unanticipated impacts and the limitations of existing siloed and relatively slow regulatory approaches are all real issues with no quick and easy answers.

However, as outlined in this report, there is a range of promising tools and approaches that can lead to quicker, more targeted, and effective efforts. By taking a broader approach to regulation—one that involves guiding principles, public sector investment, and complementary tools—governments can better address the complex challenges posed by digital technologies. Critically however, these are all approaches that will require constant attention, resourcing, and effort across levels of government and across sectors.

The digital world is not within the grasp of one department or level of government, or country, for that matter. Enhancing Canada's efforts to collaborate, share information, operate based on principles that protect the most vulnerable, and centre the voices of marginalized communities and individuals, will increase the likelihood that Canadians will live in a digital age that works for everyone.

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