A Consultation on a Modern Copyright Framework for Artificial Intelligence and the Internet of Things

Contents

1. Introduction

Since the beginning, copyright law has been shaped by major technological developments, starting with the printing press that led to copyright law, and then by other new technologies, from photography, to radio broadcasting, photocopiers and home recording devices, to the Internet and digitisation.[1] To keep pace with these technological disruptions, copyright law has had to respond and adapt. An example of such adaptation is the 2012 *Copyright Modernization Act*, which introduced a number of new provisions to ensure Canada's copyright framework continues to be effective in the digital reality of the time. Copyright law is now faced with another major technological evolution: artificial intelligence (AI), a general-purpose technology with widespread and increasing implications throughout the economy and society. AI is raising questions as to whether the copyright framework can adequately address new situations that are arising and increasingly will arise, and whether changes to the copyright framework are needed. Examples of new situations that are arising include the use of copyrighted works as part of text and data mining (TDM) to train and develop AI applications, and the use of AI to create, produce and distribute literary, musical and other kinds of works.

Recent breakthroughs in AI development have been achieved in part because of the availability of large amounts of machine-readable digital content online and of large amounts of data generated as a result of the increased digitisation of the economy, including everyday products that are connected to each other and to the Internet. This interconnected web of software-enabled products has given rise to the Internet of things (IoT), which is introducing its own set of new challenges to copyright law. The IoT highlights not only the importance of technological protection measures (TPMs) for rights holders but also the barriers to consumers' ability to repair certain software-enabled products equipped with TPMs that prevent access to the software. Challenges are also appearing in certain manufacturing industries, where small and medium enterprises (SMEs) are encountering increasing difficulties in developing interoperable products, in part because of the presence of TPMs.

Stakeholders raised challenges relating to AI and IoT during the 2018-19 parliamentary review of the *Copyright Act* (the Act). In response, the Standing Committee on Industry, Science and Technology (INDU) concluded in its final report that the Government should consider copyright policy measures addressing challenges with both AI and IoT.[2] The Standing Committee on Canadian Heritage (CHPC), which studied remuneration models for artists and creative industries as part of the review, heard less stakeholder testimony about these challenges and did not make any recommendations regarding AI and IoT. Members of CHPC nonetheless emphasised in their final report, *Shifting Paradigms*, the importance for the Government to increase its support for creators and creative industries in adapting to new digital markets.[3]

Overall, rapid advances in technology are having a profound impact on how Canadians do business, innovate, create and share cultural products. AI technology and its applications are a major driver of investment nation-wide, with more and more Canadians using digital technology to create, consume,

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[1] "History of copyright", online: Wikipedia https://en.wikipedia.org/wiki/History_of_copyright; "The history of copyright", online: Australian Libraries Copyright Committee https://libcopyright.org.au/the-history-of-copyright/.
[2] Canada, Parliament, House of Commons, *Statutory Review of the Copyright Act: Report of the Standing Committee on Industry, Science and Technology*, 42nd Parliament, 1st Session, No 16 (June 2019) [INDU Report], online: House of Commonshttps://www.ourcommons.ca/DocumentViewer/en/42-1/INDU/report-16/.
[3] Canada, Parliament, House of Commons, *Shifting Paradigms: Report of the Standing Committee on Canadian Heritage*, 42nd Parliament, 1st Session, No 19 (May 2019) [CHPC Report], online: House of Commons https://www.ourcommons.ca/DocumentViewer/en/42-1/CHPC/report-19/.

and fulfill their business needs. In this context, copyright law in Canada seeks to foster a marketplace suited to the changing needs of users, while continuing to offer creators the rights they need to encourage investment and job creation throughout the economy.

1.1 Goal of this consultation

As Budget 2021 lays out, one of the Government's strategic priorities in the post-pandemic recovery is to create jobs and growth, support Canadian researchers and innovators and ensure Canada's economy takes advantage of the opportunities ahead. This consultation is in support of that priority and furthers the mandate of the Ministers of Canadian Heritage and Innovation, Science and Industry to review the *Copyright Act*.[4]

Building on the evidence gathered during the parliamentary review, the goal of this consultation is to gather additional evidence to help the Government determine whether and what copyright policy measures should be taken to ensure Canada's copyright framework continues to achieve its underlying policy objectives and related priorities in the face of the challenges brought about by AI and IoT. With this consultation, the Government invites both evidence of a technical nature and views on potential policy directions described in more detail in the paper. AI and IoT are fast evolving technologies, uses of these technologies are changing, and consumers and businesses are facing new copyright-related challenges when using these complex technologies.

The types of technical evidence sought in this consultation include technical information about how an AI model integrates data from copyright-protected works as it "learns" from that data, the roles of various human players involved in the creation of works using AI, the extent to which copyrighted-protected works are integrated in AI applications after they are trained and commercialised, and the uses of AI-assisted and AI-generated works by businesses and consumers. With respect to IoT, evidence sought includes technical information about TPMs, how stakeholders interact with TPMs in their respective industries, and the necessary steps, third party assistance, and devices required to circumvent a TPM and perform associated tasks, such as repair or achieving interoperability of two products. Relaying experiences in other markets or jurisdictions that have enacted new measures related to AI and copyright would also be of interest.

In considering possible copyright measures relating to AI and IoT, the Government will be guided by the extent to which measures would help achieve the following objectives:

a) Support innovation and investment in AI[5] and other digital and emerging technologies in all sectors in Canada. AI has tremendous potential for society if used ethically and responsibly, and could also drive productivity growth across the economy.
b) Support Canada's cultural industries and preserve the incentive to create and invest provided by the economic rights set out in the Act. Creators, innovators and rights holders should be adequately remunerated for their works or other copyright subject matter.
c) Support competition and marketplace needs regarding IoT devices and other software-enabled products. Consumers want to be able to maintain and more easily repair the products they own, while innovators want flexibility and certainty to develop software-enabled products that are interoperable with those of other manufacturers.

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[4] "Minister of Innovation, Science and Industry Mandate Letter" (13 December 2019) and "Minister of Canadian Heritage Mandate Letter" (13 December 2019), online: Office of the Prime Minister https://pm.gc.ca/en/mandate-letters.
[5] *Budget 2021* proposes to provide up to $443.8 million over ten years, starting in 2021-22, in support of the Pan-Canadian Artificial Intelligence Strategy. See Government of Canada, *Budget 2021* at 148, online: Department of Finance https://www.budget.gc.ca/2021/report-rapport/toc-tdm-en.html.

2. Artificial intelligence (AI)

There is no single agreed definition of AI. The Organisation for Economic Co-operation and Development (OECD) defines AI as "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions […] designed to operate with varying levels of autonomy."[6] The World Intellectual Property Organisation (WIPO) defines AI as including "machines and systems that can carry out tasks considered to require human intelligence, with limited or no human intervention … [and] techniques and applications programmed to perform individual tasks."[7] The OECD also describes the various steps involved in the lifecycle of an AI system: "i) 'design, data and models'; […] encompassing planning and design, data collection and processing, as well as model building; ii) 'verification and validation'; iii) 'deployment'; and iv) 'operation and monitoring'."[8]

The Act protects literary works, which includes computer programs.[9] Therefore, software code that is in an AI system can be protected by copyright. Beyond this, developments in AI are raising a broad range of copyright policy questions that have a bearing on innovation, investment and remuneration for copyright owners in Canada. A first set of policy questions, which are part of steps i) and ii) described above, relate to TDM and the use of copyrighted content as inputs to develop AI, in particular for machine learning. Another set of copyright policy questions, which are part of steps iii) and iv) described above, are raised by the increasing capacity of AI applications to generate or assist in generating literary, musical, artistic or other kinds of works or other copyright subject matter. These policy questions include the attribution of copyright to AI-generated works and the determination of authorship and ownership of AI-generated works or AI-assisted works. A third, distinct but interrelated, set of policy questions are linked to the use and commercialising of AI applications and the liability for any infringement that occurs. This section of the consultation paper proposes to discuss these three sets of policy questions in turn.

This consultation recognises that the absence of an agreed definition of AI poses challenges for copyright policymaking. Experts in the field of AI have not yet reached agreement on common definitions, and techniques are evolving rapidly. Copyright policy will have to consider relevant differences between general AI, narrow AI, deep learning, algorithmic methods that do not necessarily involve AI, and automation and computation in general. For example, differing levels of human intervention involved in the creation of a work using these different techniques may factor into the determination of authorship, if any, and ownership of the work. To facilitate discussion, this paper considers AI broadly to encompass the variety of possible AI techniques and applications. The Government welcomes insights on potential definitions of AI for the purpose of copyright policymaking.

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[6] Organization for Economic Co-operation and Development [OECD], Legal Instrument 0449 (2019), Recommendation of the Council on Artificial Intelligence, online: OECD https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449?_ga=2.124697866.1898590258.1621541868-1852956558.1620326402.
[7] World Intellectual Property Organization [WIPO], Revised Issues Paper on Intellectual Property Policy and Artificial Intelligence (2020), online: WIPO https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=499504.
[8] OECD, *supra* note 6.
[9] *Copyright Act*, RSC 1985, c C-42, s. 2, "literary work".

2.1 Text and data mining (TDM)

The central policy issue to be explored in this part of the consultation is whether amendments should be introduced in the Act to clarify how the copyright framework applies to TDM activity, and if so, what should those amendments be. There is currently some uncertainty regarding the extent to which existing exceptions in the copyright framework apply to TDM activity. At the same time, copyright owners may find it difficult to enforce their rights and seek remuneration in the context of TDM, particularly for their works or other copyright subject matter that are publicly available online.

Enabled by increasingly more powerful computing tools and exponentially more abundant digital content and data, TDM refers to various techniques of informational analysis, including the computer-based, automated process of analysing large amounts of machine-readable information to identify trends, patterns, and relationships, and to make predictions.[10] TDM allows researchers and analysts to gain knowledge at a scale and speed that would be impossible to achieve manually, thereby making research more efficient and effective. Discoveries made and insights gained from TDM advance science, the arts and humanities, and help businesses solve problems, innovate and create more value. TDM is currently demonstrating benefit in many socially valuable applications, including health care and legal services.[11] TDM is also crucial for the development of AI technologies, especially in training AI systems and enabling machine learning.[12]

The process of conducting TDM may require the making of reproductions of large quantities of works or other copyright subject matter to extract particular data and information from them. This process may be carried out using scientific or text-based data, as well as images, sounds, or other creative works. The Act provides authors with exclusive rights to their works, which prevents others from reproducing all or a substantial part of the works unless a license is in place or an exception or limitation on enforcement applies.[13] These rights can be assigned or licensed (e.g., a transfer of the rights of ownership or exclusive licences) to another person or organization (e.g., a publisher or collective), which will in turn allow them to exercise these rights and commercially exploit the work or other subject matter. The Act also provides performers and sound recording makers a right to equitable remuneration for the public performance or communication to the public of their subject matter.[14] Furthermore, the Act provides legal protections for TPMs, which allow copyright owners to utilise TPMs to restrict access to copyrighted content or prevent others from engaging in infringing activities (e.g., making copies). These rights exist to promote the creation and distribution of content, to foster investment and job creation, and to create a thriving marketplace that offers consumers choice and access to diverse content.[15]

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[10] The 2019 EU Directive on Copyright and Related Rights in the Digital Single Market defines TDM as: "any automated analytical technique aimed at analysing text and data in digital form in order to generate information which includes but is not limited to patterns, trends and correlations." See European Union, Directive on Copyright and Related Rights in the Digital Single Market [EU Directive] (2019), online: European Union https://eur-lex.europa.eu/eli/dir/2019/790/oj.

[11] See for example: "Canada's artificial-intelligence advantage in healthcare" (2018), online: iPolitics https://ipolitics.ca/2018/08/29/canadas-artificial-intelligence-advantage-in-healthcare/; "The Ontario AI start-up helping to transform the legal sector" (2018), online: Government of Ontario https://www.investontario.ca/spotlights/ontario-ai-start-helping-transform-legal-sector.

[12] On how TDM is used to train AI, see Eleonora Rosati, "Copyright as an Obstacle or an Enabler? A European Perspective on Text and Data Mining and its Role in the Development of AI Creativity" (2019) Asia Pacific Law Review, online: Elsevier https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3452376.

[13] *Copyright Act*, ss. 3(1), *supra* note 9.

[14] *Ibid*, ss. 19(1).

[15] In *Théberge v Galerie d'Art du Petit Champlain Inc.*, the Supreme Court of Canada described the purpose of copyright as a "a balance between promoting the public interest in the encouragement and dissemination of works of the arts and intellect and obtaining a just reward for the creator (or, more accurately, to prevent someone other than the creator from appropriating whatever

Because of the large quantity of works or other subject matter often involved in TDM, obtaining any necessary authorisation from the right holders to make reproductions of the works or other subject matter being mined can be a significant burden, especially for works or other subject matter available on the Internet. In light of this difficulty, some rights holders now offer licenses to large quantities of their works specifically for TDM. However, if an exception applies to certain TDM activities then seeking authorisation or a license to make reproductions may not be required.

While the Act has many exceptions to copyright infringement, as noted above it is yet unclear how and to what extent these might, or should, apply to TDM. Two exceptions in particular have been raised in the context of TDM activity: 1) the fair dealing exception for research in section 29, and, 2) the exception for temporary reproductions for technological processes in section 30.71.[16] Fair dealing allows the use of copyrighted material that might otherwise amount to copyright infringement without permission from the owner for certain purposes and under certain conditions. Although the Supreme Court of Canada in *Law Society of Upper Canada v. CCH Canadian Limited (2004)* provided a framework to analyze whether dealing is for an allowable purpose and whether dealing is fair, this analysis is fact-specific.[17] A Canadian court applied this fair dealing framework in the context of one type of TDM activity, namely a "web-crawler" that gathered text and photos from websites to populate the defendant's own website.[18] However, uncertainty remains whether the same analysis would apply to different TDM activities and with different outputs.

As for the exception for technological processes, the Copyright Board of Canada interpreted this provision as "intended to capture copies that happen automatically, or without the direct control of the user", and that are automatically deleted once the technological process is completed.[19] Like in the case of fair dealing, there is uncertainty whether and to what extent this exception would apply to various TDM needs. While some TDM activity may require making ephemeral copies, other TDM may require copies of works to be stored indefinitely.

2.1.1 Recommendations from the parliamentary review

During the parliamentary review of the Act, some stakeholders testified before INDU that there is uncertainty as to how the *Act* and existing exceptions apply to TDM activity.[20] Businesses and researchers perceived existing exceptions in the Act as not well suited to the needs of TDM. Businesses explained that a part of the TDM activity they conduct is for commercial purposes and that they need to maintain any copies of the works or other subject matter they make for verification and validation purposes.[21]

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benefits may be generated)." See *Théberge v Galerie d'Art du Petit Champlain Inc*., 2002 SCC 34, at para. 30, online: CanLII https://www.canlii.org/en/ca/scc/doc/2002/2002scc34/2002scc34.html#par30.

[16] There are other exceptions in the Act that could apply to TDM, but they would likely apply in more limited situations and to a smaller subset of users. The limitation on damages in the case of infringement by providers of information location tools in ss. 41(27) of the *Copyright Act* might also apply to certain activities that might be considered TDM.

[17] *CCH Canadian Ltd. v Law Society of Upper Canada*, 2004 SCC 13, online: Supreme Court of Canada https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/2125/index.do.

[18] See *Century 21 Canada Limited Partnership v Rogers Communications Inc*., 2011 BCSC 1196, online: CanLII https://www.canlii.org/en/bc/bcsc/doc/2011/2011bcsc1196/2011bcsc1196.pdf. Another case that examined fair dealing in the context of reproductions of images on public websites is *Trader v CarGurus*, 2017 ONSC 1841, online: CanLII https://www.canlii.org/en/on/onsc/doc/2017/2017onsc1841/2017onsc1841.html.

[19] See *SOCAN, Re: Sound, CSI, Connect/SOPROQ, Artisti - Tariff for Commercial Radio, 2011-2017* (2016), at para. 175-186, online: Copyright Board https://decisions.cb-cda.gc.ca/cb-cda/decisions/en/366778/1/document.do.

[20] For stakeholder views on TDM see INDU Report at 85-87, *supra* note 2.

[21] See for example, *Promoting Artificial Intelligence in Canada: A Proposal for Copyright Reform,* Element AI Inc. (brief) (3 October 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10078507/br-external/ElementAI-e.pdf.

Stakeholders made a number of recommendations for legislative amendments to provide greater clarity regarding TDM activity. Stakeholder recommendations included to: expand the purposes allowed under the fair dealing exception to include TDM;[22] amend the fair dealing exception to make it open-ended, like the fair use provision in the United States;[23] amend the exception for temporary reproductions for technological processes in section 30.71 of the *Act* to cover TDM;[24] and create a new dedicated exception specifically for TDM.[25]

Stakeholders from the rights holder community made few remarks about TDM during the review, but expressed the view that there are too many exceptions in the Act and that additional exceptions could deprive them of revenues or harm their ability to exploit their works.[26] These concerns were discussed by CHPC, which highlighted how challenges with remuneration in digital markets vary by creative industry, and recommended that "the Government of Canada increase its support for creators and creative industries in adapting to new digital markets."[27]

In its final report, INDU made two recommendations that apply to TDM. First, INDU recommended that the Government "amend the *Copyright Act* to facilitate the use of a work or other subject-matter for the purpose of informational analysis".[28] Second, INDU recommended "amending section 29 of the *Copyright Act* to make the list of purposes allowable under the fair dealing exception an illustrative list rather than an exhaustive one".[29] This second recommendation would have implications on more than TDM activity.

2.1.2 Approaches in other jurisdictions

A number of Canada's key trading partners have elected to introduce a specific exception for TDM in their copyright legislation, including Japan, the United Kingdom, France, and Germany. In 2019, the European Union adopted the EU Directive on Copyright in the Digital Single Market, which requires EU member states to provide two mandatory TDM exceptions: one for the purposes of scientific research (Article 3) and another exception that covers lawfully accessible works and other subject matter, including content publicly available online (Article 4)[30]. EU member states had until June 7, 2021 to transpose the Directive into national law. The United States does not have an explicit exception for TDM. However, certain appellate-level courts have provided guidance about the extent to which copies made as part of TDM activity for commercial purposes would constitute fair use.[31]

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[22] See for example, *Untitled*, Creative Commons (brief) (15 May 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR9887146/br-external/CreativeCommons-e.pdf.

[23] See for example, *Brief – Statutory Review of the Copyright Act submitted by Pascale Chapdelaine, on behalf of Canadian intellectual property law scholars*, Pascale Chapdelaine & Myra Tawfik (brief) (22 October 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10166923/br-external/ChapdelainePascale01-e.pdf.

[24] See for example, *Untitled*, Mark Hayes (brief) (2 November 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10166884/br-external/HayesMark-e.pdf.

[25] See for example, *The Software Alliance to the Standing Committee on Industry, Science and Technology Regarding the 2018 Statutory Review of the Copyright Act*, BSA: the Software Alliance (brief) (26 September 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10057455/br-external/BSATheSoftwareAlliance-e.pdf.

[26] See for example, *Untitled*, Brush Education (brief) (15 August 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10008276/br-external/BrushEducationInc-e.pdf; or, *Untitled*, l'Association acadienne des artistes professionnels du Nouveau-Brunswick (brief) (10 December 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10268365/br-external/AssociationAcadienneDesArtistesProfessionnel-le-sDuNouveauBrunswick-9959774-e.pdf

[27] CHPC Report, Recommendation 1, *supra* note 3.

[28] INDU Report, Recommendation 23, *supra* note 2.

[29] *Ibid*, Recommendation 18.

[30] EU Directive, *supra* note 10.

[31] See *Authors Guild v Google, Inc.*, 804 F (3d) 202 (2d Cir 2015), online: Google Scholar https://scholar.google.ca/scholar_case?case=2220742578695593916&hl=en&as_sdt=6&as_vis=1&oi=scholarr and *Authors Guild v HathiTrust,* 755 F (3d) 87 (2d Cir 2014), online Google Scholar https://scholar.google.ca/scholar_case?case=4571528653505160061&hl=en&as_sdt=6&as_vis=1&oi=scholarr.

2.1.3 Call for evidence and possible way forward for Canada

The Government is seeking both information on the nature of TDM activity in Canada and the views of stakeholders on whether and how to clarify the treatment of TDM activity under the copyright framework.[32] First, the Government is seeking evidence to better understand the nature of TDM activity and industry practices in Canada. For that purpose, this consultation paper asks the following questions that arise in the development of possible copyright policy measures regarding TDM:

    i.   What barriers does the Act pose for TDM?

    ii.   What kind of TDM activities are stakeholders conducting, and what steps are involved (e.g. making reproductions of copyrighted works; circumventing a TPM; extracting and labelling data, etc.)?

    iii.   Who are the main actors in the TDM and AI value chains (e.g. are there third parties who provide services to assist in TDM activity)?

    iv.   What kind of copyright licenses for TDM activity are typically available, and how do these licenses meet the needs of those conducting TDM activity?

    v.   Are rights holders facing challenges with TDM activity and in licensing their works for TDM activity? If so, what is the nature and extent of those challenges?

    vi.   What is the current role of TPMs and digital locks in TDM activity? What barriers do rights holders face in employing TPMs to prevent infringing activity in the context of TDM? Similarly, what barriers do TPMs pose for users conducting TDM activity?

    vii.   What are common outputs of TDM activity (e.g. scientific research; AI applications; databases; various models; business knowledge, etc.), and what subsequent uses are made of these outputs?

    viii.   Are there concerns whether these outputs infringe copyright (e.g. do the outputs include complete reproductions or a substantial part of the works that were mined, licensed or otherwise)?

    ix.   Are the results or outputs of TDM activity sold or licensed to other parties who then make other subsequent uses of the outputs?

    x.   Are there concerns that the use of copyright protected works in TDM could affect or infringe the moral rights of rights holders set out in section 14.1 of the Act?

    xi.   Are there experiences of TDM approaches in other jurisdictions that could inform a Canadian consideration of this issue?

Second, subject to stakeholder responses to the above questions, the Government seeks comments on the possibility of introducing a targeted TDM exception in the Act with a clear purpose and limits. A number of choices would be available with respect to its scope, safeguards, and limitations, which would be informed by evidence provided by stakeholders in response to the above questions. While remaining open to other options inspired by the responses to questions above, the Government welcomes feedback on the following non-exhaustive list of potential choices for a new infringement exception for TDM. Policy choices would include:

Regarding scope, whether the exception should:

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i. apply to TDM for commercial purposes, non-commercial purposes, or specific industries only (e.g. training AI models);
ii. apply to all works and other subject matter (i.e. sound recordings, fixed performances and communication signals), or to a subset of works or other subject matter;
iii. permit all reproductions, incidental inclusions, all acts that would otherwise infringe copyright, or other specific activity;
iv. permit retention of reproductions for verification, validation or other purposes, or require the destruction of reproductions after a period of time or upon request from a copyright owner;
v. permit reproductions in TDM techniques that are entirely automated using computers, or that employ both computer automation and human operations (e.g. reproductions to facilitate the labelling by humans of data in the works); or
vi. be available only to individuals or entities that conduct TDM activity and use the output directly, or also be available to third parties in the TDM and AI value chain (e.g. businesses who conduct TDM activity on behalf of clients; businesses who create TDM software; users who purchase or license TDM output, etc.).

Regarding safeguards and limitations, whether the exception should:
i. be conditional on the works or other subject matter reproduced for the purpose of TDM having been legally obtained (e.g. through ownership or license; respecting machine-readable instructions from the copyright owner in accordance with industry standards, such as a robot.txt file, or a Creative Commons license);
ii. require a person to take reasonable measures to prevent the distribution or transmission of reproductions of works or other subject matter, except in defined circumstances; or
iii. require a person not to further reproduce any works or other subject matter, except in defined circumstances.

Each of these policy choices would have pros and cons. For example, a TDM exception with a broad scope could increase Canada's international competitiveness and foster innovation and attract investment in AI. At the same time, a broad scope could decrease economic returns on copyright assets by discouraging licensing activity. Similarly, safeguards and limitations should provide the desired protections against abuse while not being too onerous on those taking advantage of the exception. All comments on whether and how to clarify the treatment of TDM activity under the copyright framework are welcome, including additional ideas, legal analysis, and supporting evidence and data.

2.2 Authorship and ownership of works generated by AI

The second set of copyright policy questions relating to AI is about the more fundamental topic of authorship and ownership of works generated by AI or works created with the assistance of AI (i.e. AI-assisted works). In its review, INDU recommended that the Act "be adapted to distinguish works made by humans with the help of AI-software from works created by AI without human intervention," in order to "help Canada's promising future in artificial intelligence become reality."[33]

Aided by increasingly more sophisticated TDM, machine learning, and other technological advancements, AI can now create content previously attributable only to human persons. At this time, the creation of a work or other subject matter by AI typically involves some degree of human input; either programmers or users must instruct an AI application to perform its task. But over time, an AI

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[33] INDU Report, *supra* note 2.

system's capacity to independently generate works or other subject matter is expected to continue to increase. For example, there are now AI applications that can write movie scripts, software and music, and draw animation with little human input beyond the development of the AI itself.

These rapid developments in AI technology, combined with its burgeoning application across various sectors in the economy, lead the Government to consider whether the Act is suited to address novel questions of authorship and ownership of AI-generated or AI-assisted works. Moreover, the Government is considering whether, even if the Act is suited to address these issues, additional clarity regarding the authorship and ownership of such works could be provided to create more certainty in the marketplace. In considering these questions, the Government aims to ensure the Act supports Canada's competitiveness in AI, creators and the creative industries in Canada, while also fostering innovation and access to creative subject matter.

The Act does not explicitly define the term "author" or whether an AI application can be an author of a work. However, Canadian copyright jurisprudence suggests that an author must be a natural person who exercises skill and judgment in creating the work, reflective of the fact that the Act ties the term of protection to the life and death of an author.[34] The Supreme Court has also noted that skill and judgment "must not be so trivial that it could be characterized as a purely mechanical exercise."[35] Even if an AI-generated work could be linked back to an "author", it is not clear who should be the first owner of copyright in such a work. While AI-assisted works, in contrast to AI-generated works, appear better suited to authorship—as humans are involved in generating the work—some commentary[36] suggests that the vast array of AI technologies and the varying degrees of human input involved present issues with determining which and/or how many contributors are the appropriate authors and first owners of such a work.

For example, programmers may develop an AI application specifically with the capacity to create works. These programmers might have trained the AI to recognize artistic merit by feeding it multiple examples of artistic works, and programmed it to generate its own original artistic works. Users may also take that same AI application, provide additional input and use the application to generate works. The user might ask the AI to generate multiple works, and then curate those works to choose one in particular that meets certain artistic standards. In addition, the user may modify the selected work generated by the AI, adding the user's own artistic contribution. A user with more sophisticated technical knowledge may adapt the AI application, either directly or through additional training of the AI, causing it to generate works that meet their particular objectives and needs. These possibilities, though a simplification, illustrate the variety of possible human intervention involved in AI-assisted works. These possibilities create uncertainty as to whether an AI-assisted work would be "original" under Canadian copyright law and deserving of copyright protection.

Stemming from this difficulty in identifying the author of AI-generated or AI-assisted works is the issue of determining a first owner of such works, as the author of the work is generally the first owner of the copyright.[37] However, for certain works (e.g. works by employees) and other copyright subject-matter (i.e. a performance or sound recording), the Act provides for a first owner of copyright other than an

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[34] *CCH Canadian Ltd. v Law Society of Upper Canada*, *supra* note 17; *Setana Sport Limited v 2049630 Ontario Inc. (Verde Minho Tapas & Lounge)*, 2007 FC 899, at para. 4, Online: CanLII https://www.canlii.org/en/ca/fct/doc/2007/2007fc899/2007fc899.html?autocompleteStr=Setana%20Sport%20Limited%20v%2020496 30%20Ontario%20Inc&autocompletePos=1.

[35] *CCH Canadian Ltd. v Law Society of Upper Canada*, at para. 16, *supra* note 17.

[36] See generally Mark Perry & Thomas Margoni, "From Music Tracks to Google Maps: Who Owns Computer-Generated Works?" 11-2010 Western University Scholarship@Western Law Publications, online: The University of Western Ontario https://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1026&context=lawpub.

[37] *Copyright Act*, s. 13(1), *supra* note 9.

author.[38] As discussed in more detail below, there could be ways of clarifying first ownership of AI-generated or AI-assisted works by reconsidering how to define an author, or without relying on authorship.[39]

2.2.1 Recommendations from the parliamentary review

During the parliamentary review of the *Copyright Act*, stakeholder views on the issue of authorship and ownership of works created by AI varied. Some stakeholders expressed concern that the lack of clear indication as to who, if anyone, is the author or owner of AI-generated content creates uncertainty for market participants and could negatively impact investment, innovation, and creativity in the field of AI in Canada.[40] Others remarked that copyright law "is meant to encourage human beings to create and disseminate works" and stressed that skill and judgment by a human is required for copyright protection to apply to a work.[41]

Stakeholders highlighted different approaches Canada could take to respond to this issue.[42] Some suggested making it explicit in the Act that works created autonomously by AI, without exercise of skill and judgment on the part of a human, should not qualify for copyright protection and should fall in the public domain. Others described a need for the law to better recognize the variety of ways that AI is used to create works or other subject matter. For instance, some suggested that AI-assisted works should be granted copyright protection according to the usual copyright principles, i.e. to the extent that a human exercises sufficient skill and judgment to produce an original work using AI, that human would be the author. Correspondingly, an AI-assisted work that does not result from the exercise of skill and judgment on the part of a human would not be afforded copyright protection. Finally, some proposed to provide copyright protection to works created autonomously by AI in certain circumstances.[43]

In its report, INDU considered these possible approaches without recommending one in particular. INDU ultimately recommended that "Canada consider amending the *Copyright Act* or introducing other legislation to provide clarity around the ownership of a computer-generated work."[44]

2.2.2 Approaches in other jurisdictions

How AI in general is impacting intellectual property policy is a topic of discussion in many countries and at WIPO.[45]

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[38] *Ibid*, s. 24. With regard to a performer's performance, a sound recording, and a communication signal, the first owner of the copyright is the performer, maker, and broadcaster that broadcasts it, respectively.
[39] See Rex Shoyama, "Intelligent Agents: Authors, Makers and Owners of Computer Generated Works in Canadian Copyright Law" (2005) 4:2 Canadian Journal of Law and Technology, online: Dalhousie University https://digitalcommons.schulichlaw.dal.ca/cgi/viewcontent.cgi?article=1063&context=cjlt.
[40] See for example, *Untitled*, Dessa (brief) (14 December 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10269429/br-external/Dessa-e.pdf.
[41] See for example, *Brief - Statutory Review of the Copyright Act submitted by Myra Tawfik on behalf of Canadian intellectual property law scholars*, Myra Tawfik (brief) (22 October 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10278308/br-external/BannermanSara02-e.pdf.
[42] For stakeholder views on authorship of AI-generated works see INDU Report at 50-51, *supra* note 2.
[43] See for example, *Intellectual Property Institute of Canada (IPIC) Submission on the Statutory Review of the Copyright Act*, IPIC (brief) (9 November 2018), online: House of Commons, INDU https://www.ourcommons.ca/Content/Committee/421/INDU/Brief/BR10201958/br-external/IntellectualPropertyInstituteOfCanada-e.pdf.
[44] INDU Report at 51, *supra* note 2.
[45] WIPO, Conversation on Intellectual Property and Artificial Intelligence (2019), online: WIPO https://www.wipo.int/about-ip/en/artificial_intelligence/conversation.html.

Notable existing approaches to address authorship issues around AI-generated works are those of the United Kingdom, Ireland, and New Zealand, which attribute authorship of computer-generated works to the person who arranged for the created work. The UK Copyright Designs and Patents Act states that "in the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."[46]

In September 2020, the UK Intellectual Property Office released a consultation paper on AI and copyright and asked for views on whether to modify the UK's approach to protecting works generated by AI.[47] That paper notes that the concept of originality has evolved since this provision was introduced in UK law in 1988, and this evolution has created uncertainty about how to apply the provision to works generated by AI. The UK, in its summary of the consultation responses received, noted that stakeholders felt there was a need to clarify how to distinguish between human and AI contributions to works.[48]

2.2.3 Call for evidence and possible approaches in Canada

AI capabilities to generate works and other subject matter continue to evolve, with uncertain ramifications for creators, rights holders, innovators and content users. To better understand how AI technologies are used in the creation of works or other subject matter, and to facilitate a proactive policy discussion on authorship and ownership of AI-assisted or AI-generated works, the Government invites stakeholders to share their views and/or present evidence in response to the following questions:

i. How are individuals and organisations using AI to produce or to assist in the production of works or other copyright subject matter?
ii. Are AI-assisted works the result of deliberate choices by humans (potentially exhibiting skill and judgment), are there important variations in that regard depending on the AI application, and how could that change as AI becomes more autonomous?
iii. What challenges or disputes are being encountered when determining copyright and authorship or ownership for works or other subject matter produced by or with AI?
iv. Is the uncertainty surrounding authorship or ownership of AI-assisted and AI-generated works impacting the development and adoption of AI applications to produce works or other subject matter? If so, how?
v. What risk mitigation measures are businesses taking to protect their investments when using AI to produce works and then commercialising those works? Similarly, what risk mitigation measures are businesses taking when commercialising AI applications that can be used to produce works?
vi. What kind of licenses are being employed for the use of works or other subject matter produced with AI? What are the implications for licensing if those that develop the AI are deemed to be the authors or owners of AI-generated works?

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[46] *Copyright, Designs and Patents Act 1988, United Kingdom*, 1988 c. 48, s. 9, online: National Archives https://www.legislation.gov.uk/ukpga/1988/48/section/9.
[47] Intellectual Property Office (UK), Artificial intelligence call for views: copyright and related rights (2020), online: UK Government https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/artificial-intelligence-call-for-views-copyright-and-related-rights.
[48] Intellectual Property Office (UK), Government response to call for views on artificial intelligence and intellectual property (2021), at para. 19, online: UK Government https://www.gov.uk/government/consultations/artificial-intelligence-and-intellectual-property-call-for-views/government-response-to-call-for-views-on-artificial-intelligence-and-intellectual-property.

The Government is seeking the views of stakeholders on whether and how to change Canada's copyright framework to address uncertainties surrounding the authorship and ownership of works generated by AI or created with the assistance of AI. At this time, three alternative broad approaches could be considered in Canada, reflective of evidence presented during the parliamentary review and proposals made by scholars. Each of these approaches would have fundamentally different consequences for the marketplace, and introduce unique ancillary policy issues to resolve. These three approaches are presented for discussion purposes and do not foreclose other possible approaches that could come to light as a result of further analysis and stakeholder responses to the above questions. Additional evidence and information is required to convert these possible approaches into specific policy options.

One possible approach would be to attribute authorship of AI-generated works to the person who arranged for the work to be created, similar to the UK's copyright framework. This could require establishing factors to distinguish between AI-assisted works that meet the human authorship threshold from those that do not. This approach could mean that AI-generated works receive similar copyright protection as works created by humans.

A. Would an approach to AI-generated works that attributes authorship to the human who made arrangements for the creation of the work be feasible or desirable for Canada? Would it be feasible to distinguish between AI-assisted works, which would remain subject to the current copyright framework for authorship, and AI-generated works, which would be subject to a new framework? How should the concept of "making arrangements for the creation of the work" be interpreted? Should such an approach provide for economic rights alone for AI-generated works (i.e. no moral rights)?[49]

A second possible approach could be to clarify that copyright and authorship apply only to works generated by humans, or that no copyright may subsist in a work created without a human participating in some shape or form in the creation of the work.[50] As a result of this approach, it would be clear that any works generated by AI without a human author would immediately fall in the public domain for others to use without payment or permission required. However, when a creator uses an AI to generate a work and in the process contributes skill and judgment to the work, the creator would be the author and first owner, and the work would not fall in the public domain. While this approach could add some clarity for market participants and the courts, the difficulty in differentiating human from non-human contributions to AI-assisted works would remain a challenge.

B. Would an approach to AI-generated works that renders them ineligible for copyright be feasible or desirable for Canada? Would such an approach chill investment in AI technologies and/or the generation of works and other subject matter by AI? Would such an approach facilitate and stimulate the use of AI in the human creation of works? Could an AI-generated work be sufficiently defined (and distinguished from AI-assisted works and human-authored works) to carve these works out of the copyright framework?

A third possible approach could be to create a new and unique set of rights for AI-generated works. Such an approach would aim to provide flexibility by allowing for actors not directly related to the

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[49] See for example, Martin Miernicki and Irene Ng, "Artificial intelligence and moral rights" (2021) 36 AI & Society 319, online : Springer https://doi.org/10.1007/s00146-020-01027-6.
[50] This is the approach recommended in Daniel J. Gervais, "The Machine as Author" (2020) 105:5 Iowa Law Review 2053, online: University of Iowa https://ilr.law.uiowa.edu/print/volume-105-issue-5/the-machine-as-author/ and in Carys Craig, "AI and Copyright Law" in Florian Martin-Bariteau & Teresa Scassa (eds), *Artificial Intelligence and Law in Canada* (2021), Ottawa: LexisNexis.

creation of a work using AI to own the rights in the work.[51] Additional evidence would be required to establish which new and different rights would subsist in such works,[52] and to guide a number of policy choices, including the appropriate term of protection and the remedies in case of infringement. It would be necessary to specify a different contribution requirement, applying exclusively to AI-generated works, which would determine who is the first owner of those new rights in AI-generated works. Consideration would also need to be given to the application of moral rights to only human authors. Under this approach, in cases where a human exercised sufficient skill and judgment in the creation of a work using AI to make that work "original", that human would be the work's author and this new set of rights would not apply.

C. Would an "authorless" approach to AI-generated works be feasible or desirable for Canada? Would it be feasible to attribute ownership of an AI-generated work to a person responsible for the work? If so, what are appropriate criteria to determine this person? Would it be feasible to distinguish between AI-assisted and AI-generated works under this approach? What impact would this approach have on human artists and the creative industries?

All comments on whether and how to clarify authorship and ownership of AI-assisted or AI-generated works under the copyright framework are welcome, including additional ideas and other possible approaches,[53] legal analysis, and supporting evidence and data.

2.3 Infringement and liability regarding AI

Infringement and liability surrounding AI-generated works is the third policy area that raises novel questions of copyright law, though this issue was not the subject of a recommendation by INDU as part of the parliamentary review of the Act. Given the novelty of AI technologies, Canadian courts have not yet rendered decisions regarding liability for infringement that may result from the use of AI, either through the inputs used to train an AI or through the outputs generated by an AI system in the form of works. In light of section 2.1 above, which discussed a potential new exception for TDM that aims to alleviate some infringement concerns when training an AI, this section will focus on the potential for AI to generate works that infringe the copyright in other works, or for an AI application itself to be found to infringe copyright.

In either of these scenarios, it could be difficult for a copyright owner who is alleging infringement in the AI application or AI-generated work to identify the person, or persons, responsible and to establish liability in a court. Similar issues with identifying human contributions to AI-generated works arise as discussed in section 2.2 above. Determining liability and infringement may become increasingly complex as the level of human involvement in AI-assisted works decreases and AI's capacity to independently create works increases. In this context, the Government is calling for additional evidence from stakeholders to help guide consideration of whether and how to amend the Act to provide more clarity in the marketplace.

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[51] An example of such an approach was proposed by Pierre-Luc Racine, "Fostering Expressive Knowledge: The Copyrightability of Computer-Generated Works in Canada" (2020) 60:3 Law Review of the Franklin Pierce Center for Intellectual Property, online: UNH https://ipmall.law.unh.edu/sites/default/files/hosted_resources/IDEA/60/fostering_expressive_knowledge_-_pierre-luc_racine_60_3.pdf.

[52] The rights set out in s. 3(1) of the *Copyright Act* were designed to serve human authors. Therefore, some of these rights might not be appropriate for works generated by AI.

[53] For example, see Tom Lebrun, "L'apprentissage machine est une appropriation" (2018) 30:3 Les cahiers de la propriété intellectuelle, online: CPI https://cpi.openum.ca/articles/v30/n3/apprentissage-machine-est-une-appropriation/. Lebrun suggests that works generated by AI should be considered "reproductions".

The Government notes that removing ambiguity in these policy areas could have a positive impact on the marketplace, facilitate more efficient enforcement of copyright, and further support innovation and investment in AI. While international discussions regarding liability for infringement by an AI-generated work are taking place in various countries and at WIPO,[54] no country appears to have yet introduced amendments to their copyright law to provide greater clarity with respect to infringement and liability regarding AI-generated works.

2.3.1 Infringement under copyright law in Canada

There may not be a singular answer to clarify liability for infringement by an AI application or by an AI-assisted or AI-generated work. This section explores the variety of questions raised by this issue but it does not attempt to be exhaustive.[55] The Government welcomes feedback on additional issues not described below and on technical distinctions between types of AI.

For the AI application itself, it is unclear whether the use of copyrighted works to train AI results in reproduction of a substantial part of those works. It is also unclear whether the operation of an AI, and subsequent updating of an AI model, results in reproduction of a substantial part of works that initially trained the AI. Further, it is unclear who, if anyone, would be responsible for such infringing activity— e.g. whether a human was sufficiently involved in training the AI or updating its model to be held responsible for resulting infringement, or whether the AI directed its own training and updates. The answers to these questions will likely vary based on the type of AI system at issue and its function.

Additionally, the Act states that a person who provides a service primarily for the purpose of enabling acts of copyright infringement can be liable if an actual infringement occurs by means of the Internet or another digital network as a result of using that service.[56] It is uncertain whether creating or making an AI application available on the Internet that results in the infringement of a work would rise to this liability threshold. Liability under this provision may become increasingly difficult to establish as users contribute more substantially to AI applications before the application generates or assists in generating an infringing work and as the AI becomes more autonomous.

For an AI-assisted or AI-generated work, similar questions arise as discussed in the previous section on authorship and ownership. Namely, is there a sufficient degree of human involvement in an AI-assisted or AI-generated work to attribute personal liability when that work infringes another work? Alternatively, if such a work is found to infringe, was the level of human involvement sufficient to constitute "authorization", and can an AI application be "authorized"? Authorization may also be relevant to whether selling or licensing an AI designed to generate works constitutes authorizing that user to generate infringing works. While Canadian jurisprudence has indicated that authorizing the mere use of equipment that could be used to infringe does not amount to authorizing infringement,[57] this question may be complicated by the fact that the "equipment" was trained with copyrighted works. The answers to these questions may depend on the type of AI at issue and its function.

Additional questions of liability arise with the subsequent use of infringing AI-assisted or AI-generated works, or infringing AI applications. For example, the Act prohibits secondary infringement, which occurs when a person knows or should have known that a work or other copyright subject matter infringes copyright and does an act set out in subsection 27(2), such as selling, renting, or distributing

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[54] WIPO, at issue 8, *supra* note 7.
[55] For example, this section does not discuss situations where an AI application circumvents a TPM. It is unclear who would be liable if an AI circumvented a TPM in the process of training or other operations, and the answers to this question will vary substantially based on the type of AI at issue and its function.
[56] *Copyright Act,* ss. 27(2.3), *supra* note 9.
[57] *CCH Canadian Ltd. v Law Society of Upper Canada*, at para. 38, *supra* note 17.

an infringing copy of a work or other copyright subject matter.[58] The uncertainties surrounding primary infringement discussed above may have reverberating effects on secondary infringement, potentially chilling the market for AI-assisted and AI-generated works.

Across these scenarios, another consideration relates to establishing infringement by reproduction. A plaintiff must establish that the infringing party had access to the original copyrighted work, that the original work was the source of the copy, and that all or a substantial portion of the work was reproduced.[59] AI presents many challenges to establishing these facts, as it may be difficult to determine whether a programmer, user, some other party, or the AI itself accessed the plaintiff's work in the process of generating or contributing to an infringing work, and whether access by one of those parties can be imputed to the others. It may be even more difficult to establish that a substantial part of a work was reproduced during this process. As noted above, the operation and type of AI creates further complication for establishing access or reproduction. Certain types of AI may encounter the "black box problem", which can be described as "the inability to fully understand an AI's decision-making process and the inability to predict the AI's decisions or outputs."[60] On the other hand, transparent AI allows humans to understand what is happening in the AI model by seeing how the AI was trained and how decisions are made,[61] which may remove some barriers to establishing infringement.

2.3.2 Call for evidence regarding liability

The Government recognizes that there is less evidence currently available on these questions relative to other questions discussed in this consultation. That said, the Government understands that there are important benefits to collecting additional evidence before considering whether and how Canada's copyright framework should be clarified with respect to infringement and liability by AI applications and AI-generated or AI-assisted works. The Government would welcome receiving both additional evidence and recommendations on possible measures to address trends in the marketplace. To advance policy discussions, the Government welcomes responses to the following questions:

i. When commercialising AI applications, what measures are businesses taking to mitigate risks of liability for infringement for the AI application itself and for an AI-generated or AI-assisted work?

ii. What challenges are copyright holders facing when licensing their rights in the context of AI? What challenges are copyright holders facing when enforcing their rights in the context of AI, and how could these be solved?

iii. What are the barriers to determining whether an AI accessed or copied from a specific work during the process of generating, or contributing to, an infringing work?

iv. To what extent do AI applications contain reproductions of the copyrighted content used in training them? Are there important variations across types of AI?

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[58] *Copyright Act*, ss. 27(2), *supra* note 9. This subsection also applies to acts with respect to copyright subject matter made outside of Canada that would be infringing if it had been made in Canada.
[59] See for example *Société des lotteries du Québec v Club Lotto International C.L.I. Inc*., [2001] FCJ 94 at para. 124, 204 FTR 21, online: Federal Court
https://decisions.fct-cf.gc.ca/fc-cf/decisions/en/item/38201/index.do?q=fair+dealing&alternatelocale=en and
U & R Tax Services Ltd v H & R Block Canada Inc, [1995] F.C.J. No. 962 at para. 35, 62 C.P.R. (3d) 257.
[60] Yavar Bathaee, "The Artificial Intelligence Black Box and the Failure of Intent and Causation" (2018) 31:2 Harvard Journal of Law and Technology at 905, online: Harvard Law https://jolt.law.harvard.edu/assets/articlePDFs/v31/The-Artificial-Intelligence-Black-Box-and-the-Failure-of-Intent-and-Causation-Yavar-Bathaee.pdf.
[61] Deloitte, "Transparency and Responsibility in Artificial Intelligence: a call for explainable AI" (2019), online: Deloitte https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/innovatie/deloitte-nl-innovation-bringing-transparency-and-ethics-into-ai.pdf.

v.   Are creators and users of AI applications facing additional risks of infringement for activities besides reproduction (e.g. making AI-generated or AI-assisted content available online)?

vi.   Similar to the question in section 2.2 above, who are the different human parties involved in creating an AI system that can generate works, or assist in generating works, and what factors affect their role in that process?

All comments on whether and how to clarify infringement and liability regarding AI are welcome, including additional ideas, legal analysis, and supporting evidence and data.

3. Internet of things

The Internet of Things (IoT) is generally described as the network of Internet connected devices beyond computers, smartphones and tablets. As of November 2020, the IoT has evolved into a widespread international system of approximately 12 billion Internet-connected devices (excluding smartphones and tablets).[62] The proliferation of devices connected to the Internet is transforming supply chains, competition, and the control consumers have over their purchases. This, along with the proliferation of various other software-enabled products that may not necessarily connect to the Internet, is raising questions about the Act's provisions regarding technological protection measures (TPMs), also called digital locks.

TPMs are used to control access to digital copyrighted content (e.g., software), or to prevent users from exercising a right established in the Act without authorisation. TPMs can be used to protect any copyrighted work, a performer's performance fixed in a sound recording, or a sound recording. While protection for TPMs was originally promoted as a tool to encourage the creative industries to offer their works in the digital realm, TPMs are now being used broadly across the economy to protect software incorporated within products, in industries such as manufacturing, in ways that are linked to achieving other business objectives, including strengthening cyber security and requiring consumers to only use manufacturer-authorised repair services.

Legal protections for TPMs were introduced in the Act in 2012, consistent with the WIPO Internet Treaties that Canada ratified in 2014. As a result, a person who performs certain TPM circumvention activities may be subject to civil remedies (e.g., damages) or criminal penalties in the case of circumventions for commercial purposes. Remedies for a violation of the prohibitions regarding TPM circumvention activities are separate and independent of any remedies for copyright infringement that might occur following or as a result of TPM circumvention activities.

The Act provides legal protections for TPMs by setting out three prohibitions regarding TPM circumvention activities: the prohibition against a) circumventing a TPM, b) providing services to circumvent TPMs, and c) dealing in TPM circumvention technology (e.g. manufacturing and selling circumvention tools and devices). The Act does include a number of exceptions that permit TPM circumvention activity for certain purposes, including to ensure interoperability of computer programs, to conduct encryption research, or to unlock a cell phone to change telecommunications services. The Act also contains two regulation-making authorities to introduce additional exceptions to the prohibitions regarding TPM circumvention activities.

Obligations to protect TPMs have also been integrated into Canada's trade agreements. In particular, the Canada-United States-Mexico Agreement (CUSMA) requires Parties to prohibit: a) circumventing

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[62] "State of the IoT 2020: 12 billion IoT connections, surpassing non IoT for the first time" (2020), online: IoT Analytics https://iot-analytics.com/state-of-the-iot-2020-12-billion-iot-connections-surpassing-non-iot-for-the-first-time/.

a TPM and b) providing circumvention services or dealing in circumvention technology. CUSMA limits Parties' ability to enact new exceptions to these prohibitions to seven categories of defined activities.[63] However, Parties may introduce TPM exceptions covering additional activities when TPM protection causes an actual or likely adverse impact on non-infringing uses of copyright subject matter.[64] CUSMA further limits Parties' ability to enact new TPM exceptions to particular prohibitions.[65]

3.1 Recommendations from the parliamentary review

During the parliamentary Review of the Act, many stakeholders from the user community in various economic sectors testified that in their view TPMs are too restrictive and prohibit legitimate non-infringing activities. User stakeholder concerns included that TPMs restrict competition and ability to repair, impede businesses, undermine innovation and make interoperability difficult, undermine education and access to works, and impede the preservation mandate of libraries, archives and museums. Users called for amending the Act to permit the circumvention of TPMs for any non-infringing purpose, or to create additional exceptions to permit TPM circumvention activity for specific purposes. Some users also called for clarifying the law to ensure terms and conditions in private contracts or end-user license agreements cannot override exceptions in the Act.

INDU also heard some rights holder stakeholders in the creative industries highlight the important role TPMs play in the protection of copyright for those industries. These stakeholders noted that some businesses use TPMs to facilitate remuneration for works, protect against piracy, protect financial investments, and enable various business models based on exclusivity.[66]

The final report by INDU emphasised the importance of TPMs for creative industries while also recognizing the challenges that TPMs are posing. INDU recommended: "[t]hat the Government of Canada examine measures to modernize copyright policy with digital technologies affecting Canadians and Canadian institutions, including the relevance of technological protection measures within copyright law, notably to facilitate the maintenance, repair or adaptation of a lawfully acquired device for non-infringing purposes."[67]

Building on the evidence gathered during the parliamentary review, the Government is seeking the views of stakeholders on specific ways to adapt certain TPM provisions under the copyright framework to reflect the new market dynamics created by digital technologies. The Government is especially interested in possible measures to facilitate repair and interoperability, which are discussed in turn below.

3.2 Repair

The shift towards IoT devices and software-enabled vehicles has transformed the ownership and control consumers have over their purchases. Consumer products ranging from kitchen appliances to cars that were once only mechanical, or electrical but lacking digital capabilities, are now being

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[63] These seven categories of activities are: a) ensuring interoperability of computer programs; b) identifying flaws in encryption technology; c) protecting minors from accessing inappropriate content online; d) testing or correcting the security of computer systems or networks; e) identifying and disabling the collecting of personal information; f) law enforcement, intelligence, or security; and g) access by a non-profit library, archive, or educational institution for the purpose of making acquisition decisions. See "Canada-United States-Mexico Agreement [CUSMA]" article 20.66, at para. 4(a)-(g), online: Global Affairs Canada https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cusma-aceum/text-texte/toc-tdm.aspx?lang=eng.
[64] *Ibid*, article 20.66, at para. 4(h).
[65] *Ibid*, article 20.66, at para. 5.
[66] For stakeholder views on TPMs see INDU Report at 69-72, *supra* note 2.
[67] *Ibid*, Recommendation 19.

embedded with software. These technological transformations can make products more useful and responsive for consumers. However, at the same time, the software that controls the components of the product can be protected by copyright, which reduces some of the abilities consumers have traditionally exercised, including the ability to repair their own purchases when they malfunction or break. Furthermore, software-enabled products that have a short life or that are costly or burdensome for Canadians to repair are contributing to e-waste both domestically and overseas.[68] Enhancing the ability for Canadians to repair software-enabled products would be aligned with Canada's goals of protecting the environment.[69] Additionally, it could lead to new economic opportunities, such as an increase in SMEs that offer repair services for software-enabled products, and/or better access to repair services for consumers.

Unless their activities are covered by the existing TPM exceptions, consumers and businesses may violate one or more of the TPM prohibitions in the Act if they conduct circumvention activity for the purpose of repairing their product without the authorization of the relevant copyright owner.

Under the Act, a digital lock is considered a TPM only if it controls access to, or restricts the doing of certain specified acts with respect to, a copyrighted "work, […] a performer's performance fixed in a sound recording or […] a sound recording."[70] A digital lock that only protects access to something other than a copyrighted work, performer's performance fixed in a sound recording or a sound recording, would not be considered a TPM under copyright law. Copyright law can hinder repair to the extent that a product includes a copyrighted work (e.g. software) and repairing that product involves reproducing a substantial part of that work and/or circumventing a TPM that controls access to that work. For further clarity, a compilation of data is a type of work that can receive copyright protection where the selection and arrangement of data involves the exercise of skill and judgment.[71] Moreover, it could be possible that a TPM protects access to both copyrighted and non-copyrighted content in a product.

In addition to TPM circumvention rules under the Act, a person who wishes to repair a product with software embedded in it and who needs to circumvent a TPM to do so could face other potential impediments, such as terms and conditions in any end-user license agreement. Such agreements are generally contracts between the manufacturer of the product and the user, and could include conditions that prohibit certain acts necessary for repair, or that void the product warranty if the owner of the product repairs the product themselves or does not use an authorised repair service provider.[72]

Other challenges and considerations might come into play regarding repair. For example, independent repairers might have difficulty accessing proprietary diagnostic, servicing and repair materials or tools owned and closely held by original equipment manufacturers, which are required to repair a product.

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[68] "E-waste is the Toxic Legacy of our Digital Age", online: IFIXIT https://www.ifixit.com/Right-to-Repair/E-waste
[69] See for example Canada's clean technology plan, online: Government of Canada https://www.canada.ca/en/services/science/innovation/clean-technology.html, or the various programs and initiatives administered by Environment and Climate Change Canada, online: Government of Canada https://www.canada.ca/en/environment-climate-change.html.
[70] Copyright Act, s. 41, definition of "technological protection measure", supra note 9.
[71] Ibid, s. 2, "compilation"(b).
[72] In February 2019, ISED commissioned Option consommateurs, a non-profit consumer research and advocacy organisation, to undertake research on IoT devices. The research entailed a case study of 22 connected objects sold to Canadian consumers by gathering relevant findings from the analysis of legal documentation, such as end-user license agreements (EULA). One of the findings of the research is that the EULAs for most products contained various restrictions related to repairs, including explicitly prohibiting users from circumventing TPMs or using third party repair services. Determining whether those restrictions are legally enforceable was not part of the research. See Innovation, Science and Economic Development Canada, Consumer Related Copyright Issues on the Internet of Things: A Study of Connected Objects Available to Canada Consumers (2020), online: ISED http://www.ic.gc.ca/app/oca/crd/dcmnt.do?id=5282&lang=eng.

Consideration must also be given to preserving product safety and maintaining cyber-security.[73] While the Government acknowledges the role these issues outside copyright play in facilitating the repair of software-enabled products, this consultation aims to find solutions to only the copyright issues.

There are two broad approaches available under the Act to introduce a new TPM exception for repair: 1) introduce a specific legislative exception to the prohibitions regarding TPMs for the purpose of repair, or 2) exercise the regulatory authorities under the Act to create a regulatory TPM exception for the purpose of repair.

An example of a legislative TPM exception for the purpose of repair is the one proposed in Private Member's Bill C-272.[74] Bill C-272 seeks to provide an exception to the prohibition against circumventing TPMs and to the prohibition against dealing in TPM circumvention technology if "for the sole purpose of diagnosing, maintaining or repairing a product in which [a] computer program is embedded".[75] This consultation offers stakeholders the opportunity to share their perspectives on TPMs and repair, including on topics relevant to Bill C-272 where they overlap with this consultation.

Section 41 of the Act sets out two Governor in Council (GiC) authorities to make regulations, each of the two authorities differing in intent and scope. Under the first authority (subsection 41.21(1)), the GiC may make regulations to exclude from the application of the prohibitions under section 41.1 any TPM or class of TPMs if the GiC considers that the application of the prohibitions to those TPMs or class of TPMs would unduly restrict competition in the aftermarket sector. The second authority (subsection 41.21(2)) provides that the GiC may make regulations to prescribe additional circumstances in which the prohibition against circumventing a TPM, set out in paragraph 41.1(1)(a), does not apply, having regard to a number of factors (e.g. whether being permitted to circumvent a TPM could adversely affect the market for the work). The second authority also permits the GiC to make associated regulations to require the owner of the copyright in a work protected by a TPM to provide access to the work, and to "prescribe the manner in which, and the time within which, access is to be provided, as well as any conditions that the owner of the copyright is to comply with."[76]

3.2.1 Call for evidence regarding repair

The Government is considering whether and how to make changes to Canada's TPM framework to facilitate repair, and calls on stakeholders to provide evidence that would inform decision-making and possible options. Stakeholders are invited to engage with both Parliamentarians who are studying Bill C-272 as well as with this consultation. The Government would be interested in receiving stakeholder input in response to the following questions that arise in considering possible copyright measures to facilitate repair:

    i.   What kinds of repair activities require access to copyrighted works (e.g. software) and circumvention of TPMs (e.g. repairing, maintaining, testing, diagnostics, modifying, enhancing, and achieving interoperability with another product)?

    ii.   Which repair activities, if any, require copying all or part of the software protected by a TPM; and if so, what is the nature and extent of the copying that is required to repair a product?

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[73] See, for example, the *Canada Consumer Product Safety Act*, SC 2010, c 21, which prohibits the manufacture, import, advertisement, or sale of any consumer product that is a "danger to human health or safety". See also the Radio Standards Specifications, Health Canada's Safety Code 6, and the prohibitions under the *Radiocommunication Act*, RSC, 1985, c R-2, s 4.

[74] Canada, Parliament, House of Commons, *Bill C-272: An Act to Amend the Copyright Act (diagnosis, maintenance or repair)*, 43rd Parl, 2nd Sess (Feb 2021), online: House of Commons https://www.parl.ca/LegisInfo/BillDetails.aspx?Language=E&billId=11112088.

[75] *Ibid*.

[76] *Copyright Act*, para. 41.21(2)(b), *supra* note 9.

iii. What kinds of TPMs hinder repair of software-enabled products (e.g., do the TPMs *control access* to copyright subject matter, or *prevent copying* of copyright subject matter such as software)?

iv. What forms do the TPMs take (e.g. are TPMs mostly digital in form, or are they instead part of the physical configuration of a product[77])?

v. What is the nature and extent of effort required to determine whether, which, or how many TPMs must be circumvented for repairs? For example, are there instances where multiple TPMs must be circumvented to repair a product, or it is difficult to determine whether a digital lock is actually a TPM in the sense of copyright law?

vi. Do individuals and businesses who repair software-enabled products sometimes realise after the fact that they have inadvertently circumvented a TPM?

vii. To what extent do repair activities involve: (a) a repair person/company circumventing a TPM on behalf of a client as part of the repair service; and (b) a repair person/company making or providing a technology, device, or component to another person to be used in order to circumvent a TPM for the purpose of repair?

viii. Is cyber security, public safety and/or the disclosure of personal information at risk when a person circumvents a TPM for the purpose of repairing a product (e.g. interference with the functioning of a product and release of unsafe products on the marketplace); if so, what mitigation measures can be taken to reduce these risks?

ix. Are there products, or categories of products, for which the circumvention of TPMs for the purpose of repairing them would introduce undue risks to personal health and safety or to network functionality and public safety access?

x. Do TPMs unduly restrict competition in the aftermarket sector? If so, are particular TPMs or classes of TPMs of concern? Are particular industries or products affected more than others; and if so, how are they affected and how does it affect consumers?

xi. What other factors, besides protecting copyrighted works, do original equipment manufacturers consider when employing a TPM to protect software in a product (e.g. quality assurance and protecting their brand, strengthening cyber security, protecting privacy, respecting safety and environmental standards, etc.)?

xii. What considerations should be taken into account if copyright owners were required to provide access to software protected by TPM for the purpose of repairing a product?[78]

xiii. What harm, if any, could be done to the economic interests of manufacturers and their copyright if it would be permitted to circumvent TPMs on their products for the purpose of repair?

As mentioned earlier, TPMs were conceived as an incentive to copyright owners, especially in the creative industries, to make their works available in digital formats. In considering any exceptions to the prohibitions regarding TPM circumvention activities for the purpose of repair, the Government wants to ensure that any new TPM exception for repair does not interfere with the creative industries' ability to rely on TPMs to protect their investments.

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[77] See for example *Nintendo v King*, 2017 FC 246 at para. 86-87, online: Federal Court https://decisions.fct-cf.gc.ca/fc-cf/decisions/en/item/223922/index.do?q=Nintendo.

[78] For example, para. 41.21(2)(b) of the *Copyright Act* gives authority to the Governor in Council to make regulations to require copyright owners to provide access, *supra* note 9.

3.3 Interoperability

With the digitisation of the Canadian economy, both the prohibitions regarding TPM circumvention activity and the TPM exception for interoperability of computer programs[79] have taken on more significance. As noted earlier, increasingly more products are now embedded with software that controls their operation and features, and that collects data. Manufacturers of these products can choose to protect copyright-protected software and compilations of data with TPMs.

Digitisation has created new opportunities and challenges for businesses. Large manufacturers have seized on the ability to use TPMs to protect their copyrighted software from unauthorised uses, which can allow them at the same time to exert some degree of control over how consumers use the software-enabled products they sell and how SMEs integrate into the production value chain. Along with, or instead of TPMs, manufacturers may also use various proprietary technologies that can make it more difficult for others to make interoperable products.

These TPM and non-TPM-related barriers to interoperability have prompted some industries to develop industry-wide standards for certain important technologies in recognition of the economic benefits that interoperability can provide the whole of the industry. Nevertheless, and especially absent industry standards that facilitate interoperability, these barriers to interoperability can become barriers to entry for SMEs or inhibit the ability of SMEs to innovate and unlock new markets.

As an example, SMEs in various manufacturing industries may emerge to develop new "add-on" products that allow owners of original equipment to customize or enhance the usefulness of that equipment. SMEs can only develop such products if they are interoperable with the original equipment, and TPMs may prevent access to, or copying of, software on original equipment required to ensure that interoperability. TPMs may thereby represent a challenge for Canadian SMEs in integrating into global value chains, which is important for their competitiveness.

As with repair, the Government recognizes that many issues outside copyright law are impacting interoperability in the digital economy. For example, terms of use on software-enabled products may prohibit consumers from making some uses of their products, including installing or developing interoperable add-on products. As noted above for repair, this consultation aims to find solutions to only the copyright issues.

One industry of note has experienced frustrations over these interoperability and other digital challenges. Canada's agricultural manufacturing industry has raised concerns that the TPMs used by some original equipment manufacturers on their agricultural products' software, along with the use of proprietary technologies, impede their ability to develop innovative third-party products that are interoperable with those of original equipment manufacturers. Other industries may be facing similar challenges.

The Government is currently considering whether the exception to permit the circumvention of TPMs for the purpose of interoperability of computers programs is suited to this new reality. As digitisation continues, the Government wants to ensure that the copyright framework is able to maintain appropriate incentives for investment and innovation, while also promoting competition. Ensuring that copyright law does not unduly restrict interoperability must be balanced against copyright law's objective of incentivising investment in copyrighted works. From a public policy perspective, interoperability of computer programs facilitates interaction between different digital applications and

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[79] *Ibid*, s. 41.12.

platforms, which contributes to ease of market entry for new businesses, fosters competition, promotes overall business competitiveness and supports incremental innovation. Interoperability also gives consumers more ability to make the most use of the products they buy.

3.3.1 Current TPM exception for interoperability

In recognition of the public policy benefits for innovation and competition of facilitating interoperability,[80] the Act sets out a TPM exception for interoperability of computer programs.[81] The exception applies to all three circumvention prohibitions under the Act, namely the prohibition against: circumventing TPMs (paragraph 41.1(1)(a)), providing TPM circumvention services (paragraph 41.1(1)(b)), and dealing in circumvention technology (paragraph 41.1(1)(c)). This TPM exception also has safeguards. For example, the exception to the prohibition against circumventing a TPM only applies to a "person who owns a computer program or a copy of one, or has a licence to use the program or copy."[82] Furthermore, the exception does not apply if a "person does an act that constitutes an infringement of copyright."[83]

The TPM exception for interoperability of computer programs exists in parallel with the copyright infringement exception for interoperability of computer programs (section 30.61). This exception establishes that it is not an infringement of copyright when a person who owns a copy of a computer program, or has a licence to use a copy of the computer program, reproduces it for the "sole purpose of obtaining information that would allow the person to make the program and another computer program interoperable."[84] The person must not "use or disclose that information, except as necessary to make the program and another computer program interoperable or to assess that interoperability."[85] However, the exception applies if the information obtained is incorporated in another computer program made to be interoperable, and this computer program "is then sold, rented or otherwise distributed".[86] The two exceptions – copyright infringement (section 30.61) and TPM circumvention activities (section 41.12) – work together to support interoperability.

Some representatives of Canada's agricultural manufacturing sector argue that the TPM exception for interoperability does not provide them sufficient protection from liability for the kinds of activities they need to undertake to innovate and manufacture products required for the Canadian market that are interoperable with products from original equipment manufacturers.[87] They have raised, for example, the uncertainty as to whether this exception applies when access to data, as opposed to access to a computer program, is needed to ensure interoperability.[88] In addition, they have suggested that limiting this TPM exception to interoperability between two computer programs does not offer protection from liability in cases where only one computer program is involved in achieving interoperability of products.

[80] The Government that introduced the current TPM provisions in the *Copyright Act* in 2012 explained in the House of Commons that the TPM exceptions allow "Canadians to make reasonable use of content while providing creators and businesses, whose work depends on this content, with the tools and certainty they need to launch new products and services." See *House of Commons Debates*, 41-1, Vol 146 No 031 (18 October 2011) at 1030 (Hon. Christian Paradis), online: House of Commons https://www.ourcommons.ca/DocumentViewer/en/41-1/house/sitting-31/hansard#4376746
[81] *Copyright Act*, s. 41.12, *supra* note 9.
[82] *Ibid*, ss. 41.12(1).
[83] *Ibid*, ss. 41.12(6).
[84] *Ibid*, para. 30.61(1)(a).
[85] *Ibid*, para. 30.61(1)(b).
[86] *Ibid*, ss. 30.61(2).
[87] See for example "Urgent action needed: support for changes to Canadian copyright law" (2020), Agricultural Manufacturers of Canada [AMC], online: AMC https://www.a-m-c.ca/blog_home.asp?display=48; https://www.a-m-c.ca/blog_home.asp?display=63; and "Growing exports, fostering innovation and ensuring a strong workforce in the ag manufacturing sector essential for Canada's economic recovery" (2020), online: AMC https://www.a-m-c.ca/blog_home.asp?display=64.
[88] Anthony Rosborough, "If a Machine Could Talk, We Would Not Understand It: Canadian Innovation and the Copyright Act's TPM Interoperability Framework" (2021) 19 Journal of Law and Technology, [Forthcoming] available online: Elsevier https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3848830.

Notably, they have called for amending this TPM exception to define interoperability as "the ability of a system, software or product to exchange and make use of information and services with other systems."[89]

This uncertainty for manufacturers may be chilling investment and innovation domestically, and there have been few court decisions in Canada on circumvention of TPMs to give guidance to market participants. The *Nintendo v King* (2017 FC 246)[90] decision was the first Federal Court decision to interpret and apply the prohibitions regarding TPM circumvention activity since TPM provisions were introduced in the Act in 2012. Particularly relevant to interoperable products, the Court considered whether physical configurations of a product can be characterized as a TPM under copyright law if they control access to a copyrighted work and found that they were in that case.[91]

3.3.2 Call for evidence regarding interoperability

The Government is calling for stakeholders to present evidence of challenges they are having with the copyright framework in achieving interoperability. More specifically, the Government is seeking views on elements of section 30.61 and section 41.12 of the Act that might not be providing businesses sufficient freedom to operate and to innovate. Additional evidence from stakeholders that would be useful in this regard includes responses to the following:

i. What is the nature of information needed from copyrighted works to make software-enabled products interoperable?

ii. What kinds of TPMs hinder interoperability of software-enabled products (e.g., do the TPMs *control access* to copyright subject matter, or *prevent copying* of copyright subject matter such as software)?

iii. What forms do the TPMs that must be circumvented to ensure interoperability take (e.g. are TPMs mostly digital in form, or are they instead physical in nature[92])?

iv. What is the nature and extent of effort required to determine whether, which, or how many TPMs must be circumvented to achieve interoperability? For example, are there instances where multiple TPMs must be circumvented to make a product interoperable, or it is difficult to determine whether a digital lock is actually a TPM in the sense of copyright law?

v. Do individuals and businesses who reverse engineer, develop, and/or install interoperable products sometimes realise after the fact that they have inadvertently circumvented a TPM?

vi. What are the steps involved in achieving interoperability, including any necessary TPM circumvention activity, and who are the people who perform each of the steps (e.g. does achieving interoperability commonly entail the assistance of third-party services or developing tools to circumvent TPMs)?

vii. Do users who can circumvent a TPM to obtain information generally also have the skills to make computer programs interoperable, or do they need assistance in either of these steps?

viii. What is the nature and extent of copying (e.g. of all or part of the software in a product), if any, that is necessary to achieve interoperability? Are there important differences between types of products in this regard?

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[89] "The serious hidden problem facing Canada's agricultural innovators" (2021), online: Policy Options https://policyoptions.irpp.org/magazines/february-2021/the-serious-hidden-problem-facing-canadas-agricultural-innovators/.
[90] *Nintendo v King*, at para. 86-87, *supra* note 77.
[91] *Ibid*.
[92] *Ibid*.

ix.   To what extent does the requirement that a person must own a computer program or a copy of one, or have a licence to use the program or copy to benefit from the TPM exception for interoperability represent a barrier to certain product development activity?

x.   What mitigation measures are businesses taking to reduce legal risks associated with TPM circumvention activity for the purpose of interoperability?

xi.   To what extent can industry-led initiatives, such as the development of open interfaces, support interoperability between software-enabled products?

xii.   What factors outside of copyright law do original equipment manufacturers consider when employing a TPM that hinders interoperability (e.g. protecting their market and brand, safeguarding product safety, protecting privacy, respecting environmental standards, etc.)?

4. Conclusion

The Government welcomes all comments providing additional perspectives or evidence concerning all or any of these issues and potential options to address. Input could include reactions to possible approaches discussed, suggestions of other options or further evidence regarding these copyright policy issues. Comments may be e-mailed to copyright-consultation-droitdauteur@canada.ca until September 17, 2021. Comments received will be made publicly available following the close of the consultation. Participants are requested to submit their comments in a word document so that they can be easily converted to HTML, and to provide descriptive text for any tables or graphics. Please consult the Government's Content Style Guide to ensure your document meets the formatting requirements.