CCP Response to the IPO Consultation on Artificial Intelligence and Intellectual Property

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Please consider this response as public and citable.[1]

This submission draws partly on the empirical comparative research conducted by Dr Sabine Jacques for the Japanese Institute of Intellectual Property in March 2020, Dr Scott Summers' work for the UK Data Archive and book publication with his UK Data Service colleagues on best practices for managing and sharing research data, and other relevant research on IP. The evidence presented focuses on the three parts of the call (copyright, licensing, and patents respectively).

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[1] Suggested reference: Jacques, S., Summers, S., Evans, B. & Kahwaji, A. (2022) "CCP Response to Consultation on Artificial Intelligence and Intellectual Property". Centre for Competition Policy Consultation Response, 7 January.

Brief summary:

This submission offers evidence in response to the following questions posed in the call on Artificial Intelligence and Intellectual Property:

1) *Copyright – CGWs*
    1.2) Please rank these options in order of preference (most to least preferred) and explain why.
2) *Copyright (TDM)*
    2.1)Licensing or exceptions to copyright for text and data mining, which is often significant in AI use and development.
    2.2)Please rank the options in order of preference (most to least preferred) and explain why.
3) *Patents*
    3.1) Please rank these options in order of preference (most to least preferred) and explain why?

The evidence draws from:

- A review of historical developments in copyright and patent laws;
- A review of recent cases and most relevant literature;
- Empirical research into patentability requirements for AI inventions;
- Reusing text data for reproducibility purposes in research.

We find that:

- There is little evidence that copyright protection for computer-generated works is necessary for the objective sought. There is also a lack of evidence that the current protection for CGW is efficient. To the contrary, literature suggests that the current provision is unnecessary and disadvantageous. Whilst the provision might have some relevance now in relation to the state of the technology, its relevance is likely to decrease as human contribution becomes harder to identify;
- In relation to TDM, evidence suggests that legislative intervention in the form of a broaderTDM exception would be beneficial for promoting innovation;
- As for AI inventorship, there is currently no evidence that a legislative change as proposed is warranted. However, there are other areas of patent law where legislative intervention might be beneficial.

We recommend that:

- The current protection for CGWs is removed;
- A broader TDM exception for any use, which does not allow rights holders to opt-out, be introduced;
- And that no legal change in relation to inventorship is made at this point in time.

Introduction

AI represents tremendous opportunities for human creators and inventors in their creative processes. AI can enhance the processing of vast amounts of real-time data, AI creates actionable insights based on identified patterns without the need for human intervention and AI can solve interoperability issues between devices where operating systems have not been designed to allow devices to communicate with each other. The increasing reliance on AI in creative and innovative processes has an impact on copyright and patent laws around the world, representing both challenges and opportunities for the IP regime. And whilst a reform of copyright and patent laws alone will not resolve all of the competition issues in the affected industries, some legislative intervention could facilitate 'the UK to be the best place in the world for research and innovation' as well as being at the 'forefront of the artificial intelligence and data revolution'.[2]

If AI tends to be defined as representing human-type activities carried out by a machine, there are multiple ways in which a machine can exhibit 'intelligence' and this represents a first hurdle for policy making as for centuries, humans have been trying to devolve tasks to machines. However, the difference today is that some machines can go beyond the mere execution of a pre-defined task to show autonomy without constant input from a human. But here again, not all AIs are equal and there are different levels of autonomy ranging from constituting a mere tool (aka AI-assisted) to being fully autonomous (aka AI-generated), thereby creating unexpected outputs. Currently, the technology is at the stage of 'weak' or 'narrow AIs' where a human operator is still required although indubitably at different stages of the creative process. AI systems are mostly currently limited to what they have been programmed or designed to do. Whatever the form of AI currently, the importance of human intervention in collecting reliable data and preparing it for the AI system is crucial beyond doubt.

Section A: Copyright – computer-generated works

2. Please rank these options in order of preference (most to least preferred) and explain why.

For any legislative changes in this area, it is critical to define creativity to later assess whether AIs are capable of such endeavour. But before doing so, it is noteworthy that UK copyright law hinges the concept of creativity upon both the creative process and the creative outcome. Indeed, creativity is present at the outcome stage as authorial works need to satisfy the originality criterion (defined as the 'author's own intellectual creation').[3] Additionally, the availability of defences to copyright infringement may depend upon creative choices operated by the author during the creative process.[4]

UK copyright law is deeply rooted in labour theory. Formulated by John Locke in the 17th century, this theory implies that every man ought to be the proprietor of the result of their labour. The underlying justification being that if one owns their body, they are equally entitled to owning the fruits of their

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[2] Impact assessment, 'Consultation stage impact assessment on Artificial Intelligence and Intellectual Property' (2021) available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029930/impact-assessment.pdf, p. 1.

[3] As established since *Infopaq* and well implemented in the UK since *Meltwater*. Case C-05/08 *Infopaq International A/S v. Danske Dagblades Forening* [2009] ECR I-6569; *Newspaper Licensing Agency Ltd v Meltwater Holding BV* [2011] EWCA Civ 890 (27 July 2011).

[4] One of the most obvious example being in relation to the parody exception where the intent of the alleged infringer plays a role in the success of the defence. S. Jacques, *The Parody Exception in Copyright Law* (OUP, 2019) p. 94.

labour. Conversely, this means that the underlying materials which are relied upon in the creative process but not copyright protected such as an idea or a concept, cannot be privately owned. The idea that the author ought to be a human being was already present in Locke's work.[5] In 1695, there was a proposed amendment to shift first ownership of copyright from the author to the Stationers' Company as the sole printer of literary works. Locke was against the proposal and believed that the author, not the printers should have property rights over their works.[6]

Under the utilitarian theory lies the idea that copyright is there to promote social welfare which is achieved through providing creators with the incentives to create and disseminate works in society.[7] In short, copyright is conceived as a positive right to further a societal goal. Bar this right, less creators might invest the time and effort to create a work which may easily or cheaply be copied by others.

There is no denying that the concept of authorship has changed throughout time. Long gone is the idea of this sole creative genius and copyright law does recognise the collaborative efforts behind a work through joint or co-authorship provisions. However, it is also undeniable that the concept of authorship in international treaties has been conceived with the human author in mind. Scrutinising the Berne Convention for example, Prof. Ricketson acknowledges that the Berne Convention does not define who the author is but the text itself is written in a way which clearly identifies the author as a human being and not a machine whatever its intelligence.[8] An exception to this relates to cinematographic works where copyright can be vested in the maker of this type of work. As Ricketson rightfully points out this is an exception which should not be elevated as a principle. After all, if the Berne Convention does allow granting first ownership of copyright to film producers rather than a person, it carefully refrains from using the term 'author' and refers to 'maker'.[9]

Whilst current UK copyright legislation gives the possibility to vest copyright in the human behind the AI system, it appears appropriate to reflect on the suitability of such provision or the introduction of a new sui generis protection for computer-generated works. To some extent, we are already living in a world where almost fully automatised machines can make art (e.g. AARON, BRUTUS, Computoser and IAMUS). In which case, the notion of human author becomes absurd as the activities carried out by the human behind the machine are unlikely to attract copyright protection in the first place. Therefore, recognising creativity here is likely to jeopardise the legitimacy of the copyright system. Recognising copyright in AI-systems could lead to a shift in copyright goals by rewarding the commercial value in a work rather than the fruits of human labour. Therefore, UK law would be moving away from Locke's theory as the philosophical underpinning to copyright. It is one thing to accommodate investors in copyright works and quite another to elevate the machine or AI system as a justification for copyright protections.[10]

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[5] A. Ramalho, *Intellectual Property Protection for AI-generated Creations* (Routledge, 2021) p. 22.

[6] J. Hughes, 'Locke's 1964 Memorandum and more incomplete copyright historiographies' (2010) 27 *Cardozo Arts & Entertainment*, pp. 555-572.

[7] S. Jacques, *The Parody Exception in Copyright Law* (OUP, 2019) p. 41.

[8] S. Ricketson, 'The 1992 Horace S. Manges Lecture - People or Machines: The Berne Convention and the Changing Concept of Authorship' (1991) 16 *Colum.-VLA J. L. & Arts*, pp. 1-38.

[9] Berne Convention 1886, article 4.

[10] S. Ricketson, 'The 1992 Horace S. Manges Lecture - People or Machines: The Berne Convention and the Changing Concept of Authorship' (1991) 16 *Colum.-VLA J. L. & Arts*, pp. 1-38.

One common argument in favour of copyright protection in computer-generated works is that bar this protection, there would be less investment in AI systems. This transpires in the consultation documents where the impact assessment notes that 'the economic rationale for protecting CGWs is that it provides an incentive for private enterprise to invest in their production'.[11] However, as rightly noted in the impact assessment, other countries do not have CGW protection and there are nevertheless enough incentives to produce CGWs.[12] There is therefore no current market failure justifying legislative intervention. The incentive to invest in CGWs production is provided by adequate protection for computer programs (through copyright and/or patent) as well as the sui generis protection for databases for the parameters of the AI-system. Without further empirical evidence into the necessity of such protection, recognising protection in CGWs currently appears contrary to article 2(6) of the Berne Convention. In our opinion, human authorship is cornerstone to the copyright paradigm and legislating in this area would create a substantial shift in copyright policy which is currently not warranted. Additionally, as section 9(3) of the CDPA could conflict with international copyright law and does not appear necessary for the objective sought, it is contended that it should be removed. This is also contended by Ramalho who sees this provision as unnecessary and disadvantageous. Unnecessary due to the fact that the interpreter still has to identify the human being part of the creative process. Disadvantageous because the person making the arrangements may not be the person closest to the creative process.[13] Additionally, if the predictions on the future of autonomous AI are correct, it may become impossible to identify this human behind the machine making this provision useless. In sum, we submit that Option 1 on the removal of protection for CGWs is the best option at present.

Copyright – TDMs

7. Licensing or exceptions to copyright for text and data mining, which is often significant in AI use and development.

Text and data mining (TDM) has seen rapid growth in its use in recent years, particularly in regards for research involving big data.[14] The focus of our response for this question shall be around the use of TDM in research and the future role AI will play and impacts this shall have on the reproducibility requirements for research.

In recent years within academia, there has been a major push and acceleration of the open science and open research agenda, from the government, universities themselves, funding bodies, and publishers to make research data more open, reproducible, and shareable with other researchers, to help prevent the need to reproduce data which has been collected before.[15] When thinking about the

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[11] Impact assessment, 'Consultation stage impact assessment on Artificial Intelligence and Intellectual Property' (2021) available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1029930/impact-assessment.pdf, p. 8

[12] ibid.

[13] A. Ramalho, *Intellectual Property Protection for AI-generated Creations* (Routledge, 2021) p. 60.

[14] H. Hassani and others, 'Text Mining in Big Data Analytics' (2020) 4 *Big Data and Cognitive Computing* 1 <http://dx.doi.org/10.3390/bdcc4010001>.

[15] For example, see the ESRC Research Data Policy Principles (https://www.ukri.org/wp-content/uploads/2021/07/ESRC-200721-ResearchDataPolicy.pdf), the National Data Strategy Policy Paper 2020 (https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy) and, the UK Reproducibility Network (UKRN) (https://www.ukrn.org).

use of TDM and AI, this agenda – particularly around the importance of reproducibility of research – needs to be borne in mind. Reproducibility is a core part of research as it enables conclusions and claims to be able to be effectively tested by other researchers and built upon.[16]

One of the challenges researchers can face under the current copyright system, is that whilst for their non-commercial research another's copyright-protected data can be mined and utilised, the subsequent dataset is then unlikely to be able to be depositable with an archive for other researchers to utilise (and test for reproducibility purposes).[17] This issue becomes particularly problematic – from a reproducibility perspective – when the text or data is mined from various sources which may be updated or changed overtime, or might not be accessible by other researchers at a later date. This situation is likely to be amplified in the coming years as more research is undertaken utilising AI to speed up the process and complete the mining analysis. As AI improves, it will be become increasing more efficient and cost effective to have it undertake this analysis and trawl the data to mine. It will also likely lead to an increase in the use of AI and TDM analysis for research projects as it becomes more accessible to use AI and easier for researchers to do so. Therefore, the ability to license or deposit the dataset in some form for examination by others will be a key challenge which needs to be considered and overcome.[18] This consultation is a timely opportunity for the IPO to address these current – and future – challenges through reform and guidance for researchers.

Of the five options proposed, it is submitted that Option 1 would be the best solution to the current challenges that are faced with using AI for TDM (from a research reproducibility perspective). Improving the licensing environment will help with the reproducibility of research – and as was noted above – can specifically exclude commercial research where this is felt necessary by the rights' owner. Options regarding the use of licences include Community Data Licences, Open Data Commons Licences or Creative Commons Licences, (where these are appropriate).[19] Depending on the type of data mined and the end research data/database being produced, different licence options will need exploring. For example, Creative Commons Licences allow rights owners to easily communicate the rights they are willing to waive for others to use their work,[20] or the requirements placed upon others in using their original work.[21] Open Data Commons Licences are typically more suitable for databases (as they take these rights specifically into consideration).[22] It is possible that the government may feel that a separate category of licence needs creating here specifically for TDM and AI research, which can have multiple variants such as Creative Commons Licences have (to allow rights' holders to permit

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[16] Empirical research has highlighted the importance of this replicability in practice, e.g. Tom Hardwicke et al, 'An empirical assessment of transparency and reproducibility-related research practices in the social sciences (2014–2017)' *R. Soc. open sci.* (https://royalsocietypublishing.org/doi/10.1098/rsos.190806#d3696177e1).

[17] There are a variety of Data Archives where research data can be deposited for reuse and reproducibility, with one of the largest for social science data being the UK Data Archive (https://ukdataservice.ac.uk).

[18] When data is deposited within a research data archive restrictions and controls can be placed on it to limit future reuse, such as, for non-commercial purposes only. For an example and discussion of access controls, see S. Summers, 'Access Controls and Licensing Data', Creating Shareable Research Data: Managing and Archiving Social Science Research Data Presentation (2017) accessible at https://dam.ukdataservice.ac.uk/media/605024/2017-11-28_access_controls__licencing_of_data_final_-pdf.pdf.

[19] For example, see L. Corti, V. Van den Eynden, L. Bishop, M. Woollard, M. Haaker and S. Summers, *Managing and Sharing Research Data: A Guide to Good Practice* (2nd edn, Sage Publishing 2019), Chapter 9, pp 227-232 for a discussion of sharing data and licensing.

[20] Work here broadly including 'generic digital content' e.g. text, images or films.

[21] L. Corti, V. Van den Eynden, L. Bishop, M. Woollard, M. Haaker and S. Summers, *Managing and Sharing Research Data: A Guide to Good Practice* (2nd edn, Sage Publishing 2019), p228.

[22] ibid.

commercial or non-commercial research based upon their original work). This final option would place the choice firmly in the hands of the original rights holder, which may be seen as more beneficial than some of the latter options proposed within the consultation document, which would remove this choice from the rights holder completely or explicitly requires them to opt-out.

8. Please rank the options in order of preference (most to least preferred) and explain why.

Thinking about this issue and not from just a research reproducibility angle, there exists a strong commercial argument for the UK government to bring the TDM exception in line with the exception recently introduced by the EU. Indeed, the risk of an exodus of AI innovators from the UK's leading research and development hubs to their European counterparts must not be underestimated. More broadly, the significant economic benefits to the UK maintaining its position as the "#3 international AI leader behind the USA and China" are difficult to dispute and, to a great extent, rely upon the maintenance of a responsive, evolutionary approach to lawmaking.[23] Accordingly, one could argue Option 3 should be viewed as the minimum intervention, and would benefit from any reduction in transaction costs that may be facilitated by integrating the educational materials, model licences and codes of practice proposed in Option 1.

Yet, this EU derived formulation of the TDM exception may not represent the optimum intervention. A number of critical shortcomings to the EU exception can be identified and, based upon the drafting of this consultation, would be applicable to Option 3. Academics have argued that the provision under Article 4 of the Digital Single Market Directive for rights holders to opt-out unduly restricts TDM in the EU to the extent that it may, according to Rosati, "even defeat its purpose altogether".[24] Best endeavours to stimulate TDM would appear to fall on the deaf ears of firms accustomed to using intellectual property as a shield. This position is supported by Ducato and Strowel, who point to evidence of private ordering in the form of contractual prohibitions on TDM already employed by online platforms.[25] Whilst Option 4 dispenses with an opt-out, and could be considered as the most preferred option, the proposal would fail to overcome a further criticism of the EU exception, namely that the requirement for lawful access inhibits TDM both for research and commercial ends. With regard to the former, Geiger et al. explain how the requirement enables rights holders to erect financial access barriers to the disadvantage of the numerous modestly endowed research organisations.[26] As for the latter, mandating legal access risks significantly impairing both the quantity and quality of sources available for the development of AI. Ducato and Strowel draw attention to profound repercussions, declaring that where "input data are scarce, incomplete, not-well curated and not representative the resulting output will be poor and unreliable", a reality to which Crawford's *Atlas of AI* attests.[27]

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[23] 'Artificial Intelligence Industry in the UK Landscape Overview 2021: Companies, Investors, Influencers and Trends' (Second Edition), Innovation Eye (2021), p. 50.

[24] Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, OJ L 130, 17.5.2019; E. 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) 2 *Asia Pacific Law Review* 198, p. 215.

[25] R. Ducato and A. Strowel, 'Limitations to Text and Data Mining and Consumer Empowerment: Making the Case for a Right to Machine Legibility' (2019) 50 *International Review of Intellectual Property and Competition Law* 649, as cited in R. Ducato and A. Strowel, Ensuring Text and Data Mining: Remaining Issues With the EU Copyright Exceptions and Possible Ways Out (2021) 43 *European Intellectual Property Review*, 2021/5, p. 327.

[26] C. Geiger, G. Frosio and O. Bulayenko, 'The Exception for Text and Data Mining (TDM) in the Proposed Directive on Copyright in the Digital Single Market - Legal Aspects' (2018) *Policy Department for Citizens Rights and Constitutional Affairs, Directorate-General for Internal Policies of the Union, European Parliament*, p. 22.

[27] R. Ducato and A. Strowel, 'Ensuring Text and Data Mining: Remaining Issues With the EU Copyright Exceptions and Possible Ways Out' (2021) 43 *European Intellectual Property Review*, 2021/5, p. 330; K. Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (Yale University Press, 2021).

In response to concerns that greater intervention neglects the legitimate interests of rights holders, consideration of the purpose and objectives of copyright and the database right respectively reveals why TDM should not give rise to infringement claims. Dealing firstly with the database right and the test for infringement of the extraction right, Ducato and Strowel emphasise the position of the CJEU in *Directmedia Publishing*, according to which "the objective" of the right is to protect against the "unauthorised appropriation of the results" of the rights holder's investment in making the database, with a focus on acts that involve "reconstitution" of the database or a substantial part thereof.[28] They argue that since TDM entails the use of certain data contained in a database, rather than an act involving "reconstitution", it cannot amount to "unauthorised appropriation" and should be treated as a form of *consultation* that falls outside the scope of Article 7 of the Database Directive.[29] Turning to copyright, Gervais regards that the purpose of TDM is "*not* to convey the same or similar expressive creativity via a different medium."[30] Whilst the CJEU's decision in *Infopaq* confirms that copyright protection extends to parts of a copyright work that include elements which are the expression of the author's intellectual creation, and this has been fully integrated in UK copyright law since *Meltwater*, as reminded by Rosati, the view of Advocate General Szpunar in *Cofemel* that the right does not extend to "elements merely inspired by the ideas expressed by the work" should be keenly regarded.[31] Notably, Ducato and Strowel distinguish between infringements of the reproduction right and instances where a copyright work is reproduced for the purpose of TDM but not used *as a work*, and this very much echoes the test for infringement which has developed under trade mark law.[32]

The present consultation highlights the need to clarify both the test for infringement of the reproduction right under copyright and of the extraction right under the database right. Perhaps more fundamentally, it also underscores a pressing need for the law to address the problems of restriction and refusal of access to key input data in a way that penetrates rather than perpetuates the patchwork of inapposite intellectual property rights operating thereon. As argued by Rosati, a fundamental problem with regulating TDM under copyright law is that a risk of liability arises if legal access cannot be obtained or activities fall outside the scope of permissible exceptions "irrespective of whether the process of copying (if any) is intermediate and finalized at extracting what copyright law does not protect".[33] Ultimately, data access is likely to remain severely restricted wherever copyright and the database right are relied upon as the primary gatekeepers.

Patents

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[28] Case 304/07 *Directmedia Publishing GmbH v. Albert-Ludwigs-Universität Freiburg* [2008] ECLI:EU:C:2008:552, para 33, as cited in R. Ducato and A. Strowel, 'Ensuring Text and Data Mining: Remaining Issues With the EU Copyright Exceptions and Possible Ways Out' (2021) 43 *European Intellectual Property Review*, 2021/5, p. 335.

[29] R. Ducato and A. Strowel, 'Ensuring Text and Data Mining: Remaining Issues With the EU Copyright Exceptions and Possible Ways Out' (2021) 43 *European Intellectual Property Review*, 2021/5, p. 335.

[30] D. Gervais, 'Exploring the Interfaces Between Big Data and Intellectual Property Law', (2019) 10 *Journal of Intellectual Property, Information Technology and Electronic Commerce Law* 22, p. 32.

[31] C-5/08 *Infopaq International A/S v Danske Dagblades Forening*, [2009] EU:C:2009:465, para. 39; *The Newspaper Licensing Agency and others v Meltwater Holding BV and others* [2011] EWCA Civ 890; Opinion of Advocate General Maciej Szpunar in C-683/17 *Cofemel – Sociedade de Vestuário SA v G-Star Raw CV* [2019], EU:C:2019:363, para. 62, as cited in E. 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) 2 *Asia Pacific Law Review* 198, p. 216.

[32] R. Ducato and A. Strowel, 'Ensuring Text and Data Mining: Remaining Issues With the EU Copyright Exceptions and Possible Ways Out' (2021) 43 *European Intellectual Property Review*, 2021/5, p. 333-334.

[33] E. 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) 2 *Asia Pacific Law Review* 198, p. 215.

11. Please rank these options in order of preference (most to least preferred) and explain why?

Despite what some commentators would like us to believe, we are not yet at a stage where AI is capable of inventing autonomously. Incrementally, AI does speed up the innovation process but remains a tool for the inventor rather than replacing the human inventor. This does not mean that a rebalancing of patenting interests is not warranted. As patenting activities become cheaper and faster, this can create strains on the patent system. Often described as finding a solution to a particular problem, the inventive process actually encapsulates more than this activity. It includes identifying and formulating the problem to be solved, modelling a solution and applying the solution to the problem initially identified. AI systems are not yet capable of identifying problems on their own. Therefore, the innovative process is not fully automated yet. As reminded by Ramalho, this does not mean that AI systems are incapable of having ideas.[34] To the contrary they can dramatically speed up the experimentation process through a trial-and-error approach in numerous technical fields. Nevertheless, there is still a human required to initially define the overall problem which the ideas formulated by the AI system are supposed to solve.[35] The current state of the technology means that we are currently standing at the centre of a spectrum where AI systems can be more than just tools for the inventor but are not yet fully autonomous. AI systems are not able to construct inventive concepts but AI systems are able to autonomously generate, test and select possible solutions to a given technological problem.[36]

Overtime, many different justifications to the existence of a patent system have been advanced.[37] Similarly to what was summarised in relation to copyright earlier in this consultation, some proponents to the patent system have relied on natural rights theory.[38] Accordingly, inventors should be entitled to reap the fruits of their mental labour. Others have relied on justice theory purporting that the inventors' contributions to society should be recognised by the grant of a reward.[39] Primarily rooted in economic considerations, the incentive theory argues that the possibility of a monopoly is attractive enough to foster innovation and constitutes the most appropriate form of return for the intellectual labour deployed. Whilst this theory may incentivise individuals to apply for a patent it might not be the most efficient way to foster inventive activities. But the most popular justification focuses on the public interest.[40] Although justifications to the patent system are fluid overtime, it is

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[34] A. Ramalho, *Intellectual Property Protection for AI-generated Creations* (Routledge, 2021) p. 78.

[35] ibid; Josef Drexl and others, 'Artificial Intelligence and Intellectual Property Law: Position Statement of the Max Planck Institute for Innovation and Competition of 9 April 2021 on the current debate' (2021) *Max Planck Institute for Innovation and Competition Research Paper No. 21–10, 23* <www. ip.mpg.de/fi leadmin/ipmpg/content/stellungnahmen/MPI_PositionPaper__SSRN_21-10.pdf>. The authors goes further insofar as they comment that human decision making throughout the innovative process is still very much a necessity for applying the solutions to the initial problem defined.

[36] Even in the case of DABUS. A. Ramalho, *Intellectual Property Protection for AI-generated Creations* (Routledge, 2021) p. 84.

[37] S. Jacques, Patenting Algorithms in an Internet of Things and Artificial Intelligence World (March 2020) *Japanese Institute of Intellectual Property*, p. 3.

[38] John Locke being often relied upon but also Georg Hegel. J. Locke, *Second Treatise on Civil Government, in Two Treatises of Government* (Peter Laslett ed., CUP, 1988) Ch V. J. Hughes, 'The Philosophy of Intellectual Property' (1988) 77 *GEO. L. J.*, p. 329.

[39] P. J. Heald, 'A Transaction Costs Theory of Patent Law (2005) 66 *Ohio ST. L. J.,* p.473.

[40] R. Tushnet, 'Intellectual Property as a Public Interest Mechanism' in R. Dreyfuss & J. Pila (eds), *The Oxford Handbook of Intellectual Property Law* (OUP, 2018), p. 100. Although Ramalho differs and argues that the incentive or utilitarian theory is the main justification for the patent system. A. Ramalho, *Intellectual Property Protection for AI-generated Creations* (Routledge, 2021) p. 86.

safe to say that there is a common agreement that the public should only endure the harm done by the grant of a patent provided that there is matching public benefit.[41] Furthermore, the patent system is a regulatory tool with a strong utilitarian nature aimed at fostering technological advancements and improvement of life quality in society.

If for long, the patent system has rested on the idea of the sole inventor, this perception of the inventor is far from reflecting the reality of the innovative process. The reality is that many new technologies are invented simultaneously or nearly simultaneously by two or more teams working independently of each other. This is not well presented in the classical theories of patent law. For example, applying the Prospect theory, under which we give a patent early to one company to control research and development,[42] enables the idea of the winner-takes-it-all effect and gives a vast advantage to first movers that affects the following invention and the cumulative nature of the inventive process. Thus, revisiting the definition of the inventor in the patent theories in light of the inventive activities' actuality in the contemporary scene will enable a clearer, more contextual discussion on naming the inventor/s in a patent form. Furthermore, any legislative change will be supported by a robust and integrated theoretical base.

Under the EPC (through a combination of articles 60 and 81) as well as under UK law (section 13 UK Patents Act 1977),[43] there is a strong indication that the inventor is supposed to be a natural person (as confirmed by the purpose of this call). The requirement for the inventor to be a natural person is also confirmed by the DABUS cases,[44] as only a natural person can hold economic and moral rights under the law. Deciding to name the AI-system as an inventor brings us back to the roots of the patent system and its goals. If we agree that the patent system ought to be public-serving by ensuring that inventions reach society and that knowledge underlying the invention is disseminated, then legislative changes should contribute to these overarching goals. Currently, enabling AI-systems to be named as inventors would not reflect the state of the technology. Whilst some AI-systems may be more advanced than others in their autonomy, they still rely very much on human input at various stages of the innovative process. Therefore, it would be a fiction to name the AI-system as an inventor even if the lines between human ingenuity and AI reliance are being blurred as more often than not there is a multitude of actors involved in the innovative process. Not only does the current state of play rely on a human controlling the AI system but innovation itself relies increasingly on interdisciplinary teams coming together to solve a problem. The necessity of such legislative change is also hard to grasp. After all, as the innovative process does not form part of the disclosure requirement (as opposed to how the invention ought to be performed), there is no impediment to the patentability of an invention devised by an AI system.

Furthermore, simply enabling AI-systems to be named as inventors would not create the desired result of unlocking investment in AI development or to promote the use of AI for the public benefit. Making this legislative change would not be aligned with the spirit of the current patent system. It is

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[41] L. Bently, B. Sherman, D. Gangjee and P. Johnson, *Intellectual Property Law* (OUP, 2018) p. 397.

[42] M. A. Lemley, 'The Myth of the Sole Inventor' (2012) 110 *MICH. L. REV.* p. 709.

[43] Also present in other jurisdictions like the US: section 100(f) 35 US code, Australia: Section 15 APA. Interestingly, Japan does not have a statutory provision on who can be an inventor but court decisions hint that only human can be designated as such A. Ramalho, *Intellectual Property Protection for AI-generated Creations* (Routledge, 2021) p. 124.

[44] Case J 0008/19, *DABUS*, ECLI:EP:BA:2019:J000819.20191129 and *Thaler v The Comptroller-General of Patents, Designs And Trade Marks* [2020] EWHC 2412 (Pat) (21 September 2020).

undeniable that the patent system aims to reward human ingenuity. This is exemplified by the categories of subject-matters which exclude discoveries, scientific theories, mathematical methods from patentability as these are considered non- technical. Naming the AI as inventor or offering another type of protection as suggested in option 3 would therefore enable granting a monopoly over a system which is likely to be considered as an essential tool in the human inventor's hands to further innovation. Therefore, eventually hindering innovation.[45]

As mentioned in the impact assessment of this call for consultation if the objective is to incentivise the reliance on AI systems, there may be better ways to foster investment in this area. This could be done through a mix of public and private investment in AI-systems and the facilitation of collaborative partnerships. An important part of boosting AI investment is to invest in citizen education in AI. Too little education programs currently offer training in AI. Other initiatives have taken place in Canada,[46] Finland, Germany,[47] and France in this regard. The idea being that by enabling students to understand AI and how it can be used in a specific field then there is a higher chance that people will see how innovation enhancing AI can be.

This does not mean that no legislative changes should be made. We would like to bring to the Government's attention the possibility to revisit the disclosure requirement. Currently, patent applications do not require inventors to disclose how an invention has been invented. The only requirement is to explain to the person skilled in the art how to make and use the invention. If the patent system operates a trade-off between the grant of a monopoly in exchange for information enabling further innovation by others, it would be interesting to include that the rules and processes used in the invention are explained.[48] It is understood that patent applications as a source of knowledge are currently underutilised. If the idea behind having an enabling disclosure requirement is to foster the innovation cycle or catalyse scientific advances, perhaps a review of this part of the patent system is warranted as the social goal of contributing to the dissemination of knowledge and information is not met. Moving away from a system requiring the disclosure of how to make and use the invention towards a system requiring an explanation of why and how an invention works could be more aligned on the underlying goal.[49] Doing so will also enable the regulation of high-risk AI which could put the life and health of individuals at risk like in critical infrastructures such as transport, the safety of devices (such as used during a surgery) or other sensitive fields. Ultimately, this would also contribute to enhancing trust in AI as there would be an incentive for individuals to find ways so that the AI explains the choices made resulting in a particular invention.

Section B: Respondent information

A: Please give your name (name of individual, business or organisation).

Prepared by Sabine Jacques, Scott Summers, Benjamin Evans and Alia Kahwaji of the Centre for Competition Policy, University of East Anglia

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[45] *Mayo Collaborative Services v. Prometheus Laboratories*, 566 U.S. 66 (2012), 71, 101.
[46] Pan-Canadian Artificial Intelligence Strategy.
[47] AI Made in Germany.
[48] S. Jacques, Patenting Algorithms in an Internet of Things and Artificial Intelligence World (March 2020) *Japanese Institute of Intellectual Property*, p. 51.
[49] ibid.

B: Are you responding as an individual, business or on behalf of an organisation?

1) Business – please provide the name of your business

2) Organisation – please provide the name of the organisation

The Centre for Competition Policy (CCP)

3) Individual – please provide your name

C: If you are a responding on behalf of an organisation, please give a summary of who you represent.

The Centre for Competition Policy (CCP) is a multi-disciplinary research centre focused on competition, consumer policy and regulation, made up of about 40 affiliated faculty, including faculty with specialties in industrial organisation economics and competition law. The faculty comes from schools of business, economics, law and political science and communications. Over more than 15 years, the CCP has had projects and funding exceeding £10m since its founding, with £10m coming from the Economic and Social Research Council. The CCP has an organisational structure that includes three staff, a director and two deputy directors, as well as a steering committee that meets multiple times per year and a management board that meets once a year to oversee the Centre's operations. This institutional structure provides ongoing backup and organisational resources and experience for ensuring output delivery that is both high quality and on time.

D: If you are an individual, are you?

1) General public

2) An academic

3) A law professional

4) A professional in another sector – please specify

5) Other – please specify

E: If you are responding on behalf of an organisation, are you?

1) An academic institution

F: If you are responding on behalf of a business or organisation, in which sector(s) do you operate? (choose all that apply)

20) Education

G: How many people work for your business or organisation across the UK as a whole? Please estimate if you are unsure.

5) 1,000 or more

H: The Intellectual Property Office may wish to contact you to discuss your response. Would you be happy to be contacted to discuss your response? Yes

I: If you are happy to be contacted by the Intellectual Property Office, please provide a contact email address.

sabine.jacques@uea.ac.uk

J: Would you like an acknowledgement of receipt of your response? Yes

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