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WIPO Conversation on Intellectual Property (IP) and Artificial Intelligence (AI)

Second Session

DRAFT ISSUES PAPER ON INTELLECTUAL PROPERTY POLICY AND ARTIFICIAL INTELLIGENCE

prepared by the WIPO Secretariat

INTRODUCTION

1. Artificial intelligence (AI) has emerged as a general-purpose technology with widespread applications throughout the economy and society. It is already having, and is likely to have increasingly in the future, a significant impact on the creation, production and distribution of economic and cultural goods and services. As such, AI intersects with intellectual property (IP) policy at a number of different points, since one of the main aims of IP policy is to stimulate innovation and creativity in the economic and cultural systems.

2. As policy makers start to decipher the wide-ranging impacts of AI, the World Intellectual Property Organization (WIPO) has started to engage on the aspects of AI that are specific to IP. There are several threads to this engagement, notably:

(a) AI in IP Administration. AI applications are being increasingly deployed in the administration of applications for IP protection. WIPO Translate and WIPO Brand Image Search, which use AI-based applications for automated translation and image recognition, are two examples of such AI applications. Several IP Offices around the world have developed and deployed other AI applications. In May 2018, WIPO convened a meeting to

discuss these AI applications and to foster the exchange of information and the sharing of such applications.[1] The Organization will continue to use its convening power and position as the international organization responsible for IP policy to continue this dialogue and exchange.

(b) IP and AI Strategy Clearing House. AI has become a strategic capability for many governments across the globe. Strategies for the development of AI capacity and AI regulatory measures have been adopted with increasing frequency. The Organization has been encouraged by its Member States to collate the main government instruments of relevance to AI and IP with the aid of the Member States. To this end, a dedicated website will be published shortly that seeks to link to these various resources in a manner that facilitates information sharing.

(c) IP Policy. The third thread is an open and inclusive process aimed at developing a list of the main questions and issues that are arising for IP policy as a consequence of the advent of AI as an increasingly widely used general-purpose technology. For this purpose, a Conversation was organized at WIPO in September 2019 with the participation of Member States and representatives of the commercial, research and non-governmental sectors.[2] At the conclusion of the Conversation, a plan for the continuation of discussions by moving to a more structured dialogue was agreed in outline. The first step in the plan is for the WIPO Secretariat to develop a draft list of issues that might provide the basis for a shared understanding of the main questions that need to be discussed or addressed in relation to IP policy and AI.

3. The present paper constitutes the draft prepared by the WIPO Secretariat of issues arising for IP policy in relation to AI. The draft is being made available for comments by all interested parties, from the government and non-government sectors, including Member States and their agencies, commercial actors, research institutions, universities, professional and non-governmental organizations and individuals. All interested parties are invited to submit their comments to ai2ip@wipo.int by February 14, 2020. Comments are requested on the correct identification of issues and if there are any missing issues in order to formulate a shared understanding of the main questions to be discussed. Answers to the identified questions are not required at this stage. Submissions may cover one, more than one, or all issues. All comments will be published on the WIPO website.

4. Following the closure of the comment period, the WIPO Secretariat will revise the Issues Paper in the light of comments received. The revised Issues Paper will then form the basis of the Second Session of the WIPO Conversation on IP and AI, structured in accordance with the Issues Paper, which will be held in May 2020.

5. The issues identified for discussion are divided into the following areas:

(a) Patents

(b) Copyright

[1] A summary of the meeting is available at https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=407578.
The Index of AI initiatives in IP offices is available at WIPO's dedicated website to AI and IP https://www.wipo.int/ai.
[2] A summary of the Conversation is available at https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=459091.

(c) Data

(d) Designs

(e) Technology Gap and Capacity Building

(f) Accountability for IP Administrative Decisions

PATENTS

Issue 1: Inventorship and Ownership

6. In most cases, AI is a tool that assists inventors in the invention process or constitutes a feature of an invention. In these respects, AI does not differ radically from other computer-assisted inventions. However, it would now seem clear that inventions can be autonomously generated by AI, and there are several reported cases of applications for patent protection in which the applicant has named an AI application as the inventor.

7. In the case of inventions autonomously generated by AI:

(i) Should the law permit or require that the AI application be named as the inventor or should it be required that a human being be named as the inventor? In the event that a human inventor is required to be named, should the law give indications of the way in which the human inventor should be determined, or should this decision be left to private arrangements, such as corporate policy, with the possibility of judicial review by appeal in accordance with existing laws concerning disputes over inventorship?

Points of consideration for issue 1(7)(i):

Issue of legal personhood of AI: An algorithm does not carry legal personhood and as usually understood under patent law, an inventor is a natural person. Thus, the main question that arises is whether an entity other than a natural person can be an inventor? Further, the legal status of AI is not defined, even as a corporate entity. Thus, one of the fundamental questions is the legal personhood of AI – can it be an independent entity or an extension of a human inventor's or corporate entity's personhood.

Potential loss of Public Interest Aspect: In most jurisdictions the patent system allows an inventor – a natural person benefits of a legal monopoly for a certain period of time in lieu of disclosure of an invention to the public. The system is in place firstly to incentivize innovation and secondly for further advancement of science and technology. An algorithm is essentially a tool that maybe employed by a natural person or a corporate entity to arrive at a desired outcome which may be deemed innovative by current patentability standards. Thus, the following issue arise:

a) The incentivisation of innovation aspect is lost especially for natural persons if an algorithm is deployed by a corporation en masse.

b) The massive rate at which AI can generate solutions which cross the present threshold of patentability may lead to skewing of the balance sought via the patent system against public interest due to excessive monopoly generated by automation of innovation.

(ii) The inventorship issue also raises the question of who should be recorded as the owner of a patent involving an AI application. Do specific legal provisions need to be introduced to govern the ownership of autonomously generated AI inventions, or should ownership follow from inventorship and any relevant private arrangements, such as corporate policy, concerning attribution of inventorship and ownership?

(iii) Should the law exclude from the availability of patent protection any invention that has been generated autonomously by an AI application? See also Issue 2, below.

Issue 2: Patentable Subject Matter and Patentability Guidelines

8. Computer-assisted inventions and their treatment under patent laws have been the subject of lengthy discussions in many countries around the world. In the case of AI-generated or -assisted inventions:

(i) Should the law exclude from patent eligibility inventions that are autonomously generated by an AI application? See also Issue 1(iii), above.

(ii) Should specific provisions be introduced for inventions assisted by AI or should such inventions be treated in the same way as other computer-assisted inventions?

Points of consideration for Issues 2(8)(i) & (ii):

A sui generis system for protection of AI based invention should be developed that addresses the issues associated with the protection of AI and balances the public interest aspect. Co-inventorship by an algorithm in conjunction with either a natural or legal entity maybe allowed wherein the legal entities exercise the rights and obligations associated with the IPR. The protection regime maybe shorter, the algorithm deposition in a repository maybe mandatory and to prevent a monopoly that maybe a drag on innovation ecosystem FRAND like obligations might be incorporated.

(iii) Do amendments need to be introduced in patent examination guidelines for AI-assisted inventions? If so, please identify which parts or provisions of patent examination guidelines need to be reviewed.

Issue 3: Inventive Step or Non-Obviousness

9. A condition of patentability is that the invention involves an inventive step or be non-obvious. The standard applied for assessing non-obviousness is whether the invention would be obvious to a person skilled in the relevant art to which the invention belongs.

(i) In the context of AI inventions, what art does the standard refer to? Should the art be the field of technology of the product or service that emerges as the invention from the AI application?

(ii) Should the standard of a person skilled in the art be maintained where the invention is autonomously generated by an AI application or should consideration be given to replacing the person by an algorithm trained with data from a designated field of art?

(iii) What implications will having an AI replacing a person skilled in the art have on the determination of the prior art base?

Points of consideration for Issues 3(9)(iii):

This is a one of the core issues as the assessment of obviousness as a natural person skilled in the art will have a limited knowledgebase as compared to a trained AI algorithm which can be programmed to have a wider knowledgebase exceeding that of the common general knowledge of a skilled person. This is the crux of the issue as deploying AI having a wider knowledgebase may genuinely accelerate the pace of inventions and thus must be encouraged. However, if AI based innovation is allowed same level of protection as under current patent regime, there is a danger of excessive and concentrated monopoly. Thus, AI based inventions should be encouraged and assessed under a separate IP regime.

(iv) Should AI-generated content qualify as prior art?

Issue 4: Disclosure

10. A fundamental goal of the patent system is to disclose technology so that, in the course of time, the public domain may be enriched and a systematic record of humanity's technology is available and accessible. Patent laws require that the disclosure of an invention be sufficient to enable a person skilled in the relevant art to reproduce the invention.

(i) What are the issues that AI-assisted or AI-generated inventions present for the disclosure requirement?

(ii) In the case of machine learning, where the algorithm changes over time with access to data, is the disclosure of the initial algorithm sufficient?

(iii) Would a system of deposit for algorithms, similar to the deposit of microorganisms, be useful?

(iv) How should data used to train an algorithm be treated for the purposes of disclosure? Should the data used to train an algorithm be disclosed or described in the patent application?

(v) Should the human expertise used to select data and to train the algorithm be required to be disclosed?

Issue 5: General Policy Considerations for the Patent System

11. A fundamental objective of the patent system is to encourage the investment of human and financial resources and the taking of risk in generating inventions that may contribute positively to the welfare of society. As such, the patent system is a fundamental component of innovation policy more generally. Does the advent of inventions autonomously generated by AI applications call for a re-assessment of the relevance of the patent incentive to AI-generated inventions. Specifically,

(i) Should consideration be given to a sui generis system of IP rights for AI-generated inventions in order to adjust innovation incentives for AI?

(ii) Is it too early to consider these questions because the impact of AI on both science and technology is still unfolding at a rapid rate and there is, at this stage, insufficient understanding of that impact or of what policy measures, if any, might be appropriate in the circumstances?

Competition and Unfair Competition Considerations:

AI based innovation can create a knowledge based economy that is skewed in favor of IT tech companies even in area that are traditionally not considered in the same domain such as finance or pharma. Also, an accelerated pace of invention by means of AI may lead to patent monopolies. Hence, further assessment of impact of AI based innovation on free and fair competition is required. Consideration of a sui generis IP regime for AI inventions should also consider the competition and market dominance aspects.

COPYRIGHT AND RELATED RIGHTS

Issue 6: Authorship and Ownership

12. AI applications are capable of producing literary and artistic works autonomously. This capacity raises major policy questions for the copyright system, which has always been intimately associated with the human creative spirit and with respect and reward for, and the encouragement of, the expression of human creativity. The policy positions adopted in relation to the attribution of copyright to AI-generated works will go to the heart of the social purpose for which the copyright system exists. If AI-generated works were excluded from eligibility for copyright protection, the copyright system would be seen as an instrument for encouraging and favoring the dignity of human creativity over machine creativity. If copyright protection were accorded to AI-generated works, the copyright system would tend to be seen as an instrument favoring the availability for the consumer of the largest number of creative works and of placing an equal value on human and machine creativity. Specifically,

(i) Should copyright be attributed to original literary and artistic works that are autonomously generated by AI or should a human creator be required?

(ii) In the event copyright can be attributed to AI-generated works, in whom should the copyright vest? Should consideration be given to according a legal personality to an AI application where it creates original works autonomously, so that the copyright would vest in the personality and the personality could be governed and sold in a manner similar to a corporation?

(iii) Should a separate sui generis system of protection (for example, one offering a reduced term of protection and other limitations, or one treating AI-generated works as performances) be envisaged for original literary and artistic works autonomously generated by AI?

Issue 7: Infringement and Exceptions

13. An AI application can produce creative works by learning from data with AI techniques such as machine learning. The data used for training the AI application may represent creative works that are subject to copyright (see also Issue 10). A number of issues arise in this regard, specifically,

(i) Should the use of the data subsisting in copyright works without authorization for machine learning constitute an infringement of copyright? If not, should an explicit

exception be made under copyright law or other relevant laws for the use of such data to train AI applications?

(ii) If the use of the data subsisting in copyright works without authorization for machine learning is considered to constitute an infringement of copyright, what would be the impact on the development of AI and on the free flow of data to improve innovation in AI?

(iii) If the use of the data subsisting in copyright works without authorization for machine learning is considered to constitute an infringement of copyright, should an exception be made for at least certain acts for limited purposes, such as the use in non-commercial user-generated works or the use for research?

(iv) If the use of the data subsisting of copyright works without authorization for machine learning is considered to constitute an infringement of copyright, how would existing exceptions for text and data mining interact with such infringement?

(v) Would any policy intervention be necessary to facilitate licensing if the unauthorized use of data subsisting in copyright works for machine learning were to be considered an infringement of copyright?

(vi) How would the unauthorized use of data subsisting in copyright works for machine learning be detected and enforced, in particular when a large number of copyright works are created by AI?

Issue 8: Deep Fakes

14. The technology for deep fakes, or the generation of simulated likenesses of persons and their attributes, such as voice and appearance, exists and is being deployed. Considerable controversy surrounds deep fakes, especially when they have been created without the authorization of a person depicted in the deep fake and when the representation creates actions or attributes views that are not authentic. Some call for the use of deep fake technology to be specifically banned or limited. Others point to the possibility of creating audiovisual works that might allow the deployment of popular or famous performers after their demise in a continuing manner; indeed, it might be possible for a person to authorize such use.

15. Should the copyright system take cognizance of deep fakes and, specifically,

(i) Since deep fakes are created on the basis of data that may be the subject of copyright, to whom should the copyright in a deep fake belong? Should there be a system of equitable remuneration for persons whose likenesses and “performances” are used in a deep fake?

Issue 9: General Policy Issues

16. Comments and suggestions identifying any other issues related to the interface between copyright and AI are welcome. Specifically,

(i) Are there seen or unforeseen consequences of copyright on bias in AI applications? Or is there a hierarchy of social policies that needs to be envisaged that would promote the preservation of the copyright system and the dignity of human creation over the encouragement of innovation in AI, or vice versa?

DATA

17. Data are produced in increasingly abundant quantities, for a vast range of purposes, and by a multiplicity of devices and activities commonly used or undertaken throughout the whole fabric of contemporary society and the economy, such as computing systems, digital communication devices, production and manufacturing plants, transportation vehicles and systems, surveillance and security systems, sales and distribution systems, research experiments and activities, and so on.

18. Data are a critical component of AI since recent AI applications rely upon machine learning techniques that use data for training and validation. Data are an essential element in the creation of value by AI and are, thus, potentially economically valuable. Comments on appropriate access to data protected by copyright used for training AI models should be included in Issue 7 above.

19. Since data are generated by such a vast and diverse range of devices and activities, it is difficult to envisage a comprehensive single policy framework for data. There are multiple frameworks that have a potential application to data, depending on the interest or value that it is sought to regulate. These include, for example, the protection of privacy, the avoidance of the publication of defamatory material, the avoidance of the abuse of market power or the regulation of competition, the preservation of the security of certain classes of sensitive data or the suppression of data that are false and misleading to consumers.

20. The present exercise is directed only at data from the perspective of the policies that underlie the existence of IP, notably, the appropriate recognition of authorship or inventorship, the promotion of innovation and creativity, and the assurance of fair market competition.

21. The classical IP system may be considered already to afford certain types of protection to data. Data that represent inventions that are new, non-obvious and useful are protected by patents. Data that represent independently created industrial designs that are new or original are likewise protected, as are data that represent original literary or artistic works. Data that are confidential, or have some business or technological value and are maintained as confidential by their possessors, are protected against certain acts by certain persons, for example, against unauthorized disclosure by an employee or research contractor or against theft through a cyber intrusion.

22. The selection or arrangement of data may also constitute intellectual creations and be subject to IP protection and some jurisdictions have a sui generis database right for the protection of the investment made in compiling a database. On the other hand, copyright protection is not extended to the data contained in a compilation itself, even if the compilations constitute copyrightable intellectual creations.

23. The general question that arises for the purposes of the present exercise is whether IP policy should go further than the classical system and create new rights in data in response to the new significance that data have assumed as a critical component of AI. The reasons for

considering such further action would include the encouragement of the development of new and beneficial classes of data; the appropriate allocation of value to the various actors in relation to data, notably, data subjects, data producers and data users; and the assurance of fair market competition against acts or behavior deemed inimical to fair competition.

Issue 10: Further Rights in Relation to Data

(i) Should IP policy consider the creation of new rights in relation to data or are current IP rights, unfair competition laws and similar protection regimes, contractual arrangements and technological measures sufficient to protect data?

(ii) If new IP rights were to be considered for data, what types of data would be the subject of protection?

(iii) If new IP rights were to be considered for data, what would be the policy reasons for considering the creation of any such rights?

(iv) If new IP rights were to be considered for data, what IP rights would be appropriate, exclusive rights or rights of remuneration or both?

(v) Would any new rights be based on the inherent qualities of data (such as its commercial value) or on protection against certain forms of competition or activity in relation to certain classes of data that are deemed to be inappropriate or unfair, or on both?

(vi) How would any such rights affect the free flow of data that may be necessary for the improvement of AI, science, technology or business applications of AI?

(vii) How would any new IP rights affect or interact with other policy frameworks in relation to data, such as privacy or security?

(viii) How would any new IP rights be effectively enforced?

DESIGNS

Issue 11: Authorship and Ownership

24. As with inventions, designs may be produced with the assistance of AI and may be autonomously generated by an AI application. In the case of the former, AI-assisted designs, computer-aided design (CAD) has long been in use and seems to pose no particular problems for design policy. AI-assisted designs might be considered a variant of computer-aided design and might be treated in the same way. In the case of AI-generated designs, questions and considerations arise that are similar to those that arise with respect to AI-generated inventions (Issue 1, above) and AI-generated creative works (Issue 6, above). Specifically,

(i) Should the law permit or require that design protection be accorded to an original design that has been produced autonomously by an AI application? If a human designer is required, should the law give indications of the way in which the human designer should be determined, or should this decision be left to private arrangements, such as corporate policy, with the possibility of judicial review by appeal in accordance with existing laws concerning disputes over authorship?

(ii) Do specific legal provisions need to be introduced to govern the ownership of autonomously generated AI designs, or should ownership follow from authorship and any relevant private arrangements, such as corporate policy, concerning attribution of authorship and ownership?

TECHNOLOGY GAP AND CAPACITY BUILDING

25. The number of countries with expertise and capacity in AI is limited. At the same time, the technology of AI is advancing at a rapid pace, creating the risk of the existing technology gap being exacerbated, rather than reduced, with time. In addition, while capacity is confined to a limited number of countries, the effects of the deployment of AI are not, and will not be, limited only to the countries that possess capacity in AI.

26. This evolving situation raises a considerable number of questions and challenges, but many of those questions and challenges lie well beyond IP policy, involving, for example, questions of labor policy, ethics, human rights and so forth. This present list of issues, and WIPO's mandate, concerns IP, innovation and creative expressions only. In the field of IP, are there any measures or issues that need to be considered that can contribute to reducing the adverse impact of the technology gap in AI?

Issue 12: Capacity Building

(i) What policy measures in the field of IP policy might be envisaged that may contribute to the containment or the reduction in the technology gap in AI capacity? Are any such measures of a practical nature or a policy nature?

ACCOUNTABILITY FOR IP ADMINISTRATIVE DECISIONS

27. As indicated in paragraph 2(a), above, AI applications are being increasingly deployed in IP Administration. The present list of issues is not concerned with questions relating to the development and possible sharing of such AI applications among Member States, which are being discussed in various working meetings of the Organization and in various bilateral and other relationships between different Member States. However, the use of AI in IP Administration also raises certain policy questions, most notably the question of accountability for decisions taken in the prosecution and administration of IP applications.

Issue 13: Accountability for Decisions in IP Administration

(i) Should any policy or practical measures be taken to ensure accountability for decisions made in the prosecution and administration of IP applications where those decisions are taken by AI applications (for example, the encouragement of transparency with respect to the use of AI and in relation to the technology used)?

(ii) Do any legislative changes need to be envisaged to facilitate decision-making by AI applications (for example, reviewing legislative provisions on powers and discretions of certain designated officials)?

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