COMMENTS ON DRAFT ISSUES

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ISSUE 1: INVENTORSHIP AND OWNERSHIP

(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?**

In a paradigm where AI is being listed as inventor, contribution of AI and human has to be clearly determined. For making such determination the role of AI in the conception of invention should be disclosed. Therefore, in the opinion of authors an additional requirement for disclosing the method of conceptualizing the invention is needed so as to ascertain the role of AI as an inventor. According to authors, method of conceptualizing the invention can be done by determining the kind of algorithm used, the type of training used to develop algorithms, the type of training data, the period of training, optimization of outputs, implementation of the invention etc.

This issue is of significance because it can potentially affect the value of inventorship status. Humans should not be allowed take credit for inventions generated by an AI. If humans are allowed to claim credit for AIs invention and do not disclose the AI's involvement in the same, there is a possibility of not appreciating of human's intellectual labor in the cases where (s)he is the true inventor of an invention. Human inventors seek the inventorship status for reputational purposes and it is the only mode of recognition of the intellectual labor put into the invention. This status, in a paradigm where AIs are not granted inventorship and human owners obtain that status, will always be looked upon with suspicion thereby destroying the purpose of having the status. If the AIs are denied inventorship, as EU did[1], applicants will not list AIs as inventors and thereby giving rise to the aforementioned issues.

[1] EP18275163 and EP18275174.

Further, when AIs are allowed to be listed as inventors, safeguards need to be introduced to prevent human inventors from claiming inventorship for an AI generated invention and additional disclosure requirements must be introduced to allow the determination of their contribution to the patent offices.

It is suggested that this issue is discussed from the perspective of introducing an additional requirement for disclosing the manner/method of invention. Historically, the disclosure of method/manner/mode of invention has not been mandated as a requirement in an application; primarily to not exclude unanticipated inventions from being disclosed and protected. However, the introduction of this requirement needs sufficient consideration as a potential solution to enable the patent offices to discern and ensure the proper attribution of the inventor in the application.

This obligation may require the applicant to provide a description of the kind of algorithm used, the type of training used to develop algorithms, the type of training data, the period of training, optimization of outputs, implementation of the invention etc. The listing of humans as inventors in such cases will then depend on factors such as the intellectual efforts involved in the procurement, arrangement and input of data to the AI and the methods involved in its training.

(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?**

The owner is essentially the right-holder of the patent and it is he who exercises those rights. Granting the ownership to a non-human gives rise to an absurd situation where the invention remains unused as the public is prevented from using the invention by the rights of the owner while the owner is incapable of using the invention itself or grant other permission to use the same. The issue should instead focus on to which human should the ownership be granted to, specifically the following;

- Designer of the AI
- The person who supplies resources such as data, electricity, maintenance of data etc.
- The person who recognizes the output/invention, i.e. the discoverer of the invention

The primary consideration in determining to whom among the above can be granted ownership of the patent is the determination of the activity that incentivizes further innovation. In the opinion of the authors, it is the person who provides resources to the AI who should be granted

the ownership to the patent. The grant of ownership, and thereby the ability to commercialize and derive economic benefits serves as an incentive to continue providing resources to the AI for generating more inventions. However, there is a need for clearer guidelines for making such determinations as these categories are not mutually exclusive and the current disclosure requirements do not provide sufficient information to make such determination.

ISSUE 2: PATENTABLE SUBJECT MATTER AND PATENTABILITY GUIDELINES

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

Not granting patent-eligibility to autonomously AI generated inventions will have a devastating impact on the future inventions. If AI generated inventions are excluded from patentability, efforts will be made to protect such inventions as trade secrets and through extensive non-disclosure agreements, instead of seeking patents and making the inventions public. Disclosure of regarding a patent is crucial because of the advantages or benefits associated with the same. Moreover, the current disclosure requirements do not allow the application to provide indications to ascertain which inventions were conceived by humans and AI.

(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?**

Inventions assisted by AI must be treated the same way as other computer assisted inventions. However, the degree of contribution to the invention needs to be assessed for appropriate listing of inventors. This requirement holds relevance when determining the true inventor of the invention. As the authors support the listing of AIs as inventors, this requirement enables the examiners to assess the contribution from both AIs and humans, and determine the true inventor of the invention. The disclosure requirement should mandate the applicant to provide a description of the kind of algorithm used, the type of training used to develop algorithms, the type of training data, the period of training, optimization of outputs, implementation of the invention etc. The listing of humans as inventors in such cases will be depend on factors such as the intellectual efforts involved in procurement, arrangement and input of training data to the AI.

(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.**

An additional requirement of the method/mode of arriving at the invention needs to be introduced. This requirement, which seeks the mode in which an invention was conceived and

implemented, will allow the patent offices to discern the contribution of AIs in an invention. This has not been made a requirement by different jurisdictions so as not to exclude inventions conceived through accidents. A notable example of such inventions is aspirin. The grant of protection for such inventions was justified due to the advantages or the benefits available from disclosing them to the public instead of denying its grant.

However, the moment two or more persons are involved in invention, those who have contributed for the invention are only listed as inventors. Similarly, in order to ascertain the role of AI in AI assisted inventions the kind of algorithm used, the type of training used to develop algorithms, the type of training data, the period of training, optimization of outputs, implementation of the invention etc. However, patent offices should also consider the issues involved in ensuring the accuracy of applicant's version of mode/method of invention.

ISSUE 3: INVENTIVE STEP OR NON-OBVIOUSNESS

(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?**

In the opinion of the authors, the standard has already increased. A recognized test for (non)-obviousness is the Windsurfing test.[2] Once the similarities and dissimilarities are identified, a person skilled in the art must not find the invention obvious. A person skilled in the art is a person who is abreast with the developments in his/her respective fields, including the technologies (tools) used in the field of art. Further, in order for the legal requirement of inventive step to achieve its purpose, it must take into account all the tools available to an inventor for the purpose of inventing, irrespective of what tools are personal available to him/her.[3] This implies a person skilled in the art is also a person who understands the applications of an AI and is capable of determining whether the invention would be obvious if an AI is used as a tool for the same. Essentially, the person skilled in the art needs to make an additional assessment of whether the invention will be obvious when an algorithm or an AI is trained with the data from a designated field of art. If the invention is an obvious output of AI trained with such data, the said invention will not pass the test of inventive step. Thus, AIs have brought additional considerations for the inventive step requirement, thereby raising the standard.

[2] *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59

[3] Robert Plotkin, *The Genie in the Machine: How Computer-automated Inventing is Revolutionizing Law and Business* (1st edn, Stanford Law Books 2009)

The standards should not be raised or relaxed unevenly for human and AI inventors. It should be maintained the same for both human and AI generated inventions. If standard is increased for AI inventors, it will lead to a surge in applications with humans listed as inventors, due to risks involved meeting the higher standards. Conversely, if the standard is relaxed for AI inventors, it will lead to a surge in applications with AIs listed as inventors as it is easier to meet the lower standard. Applicants will always choose the mode of IP protection that is the most efficient and involves the least amounts of uncertainty. Further, existence of two different standards might create counterproductive results.

ISSUE 4: DISCLOSURE

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

This issue has similar ramifications as that of AI inventorship. In both cases, issue arises in determining the contribution of AI in such inventions, as the current disclosure requirements are insufficient for the ascertainment of the contribution by both AI and the human.

(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?**

If such disclosure requirement accommodates the interest of the applicants in terms of ownership and willingness to publicly disclose such data, then such disclosure requirements can be adopted.

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

This issue in the opinion of the authors should also be expanded to include all aspects of the method of invention such as period of training, optimization of outputs and implementation of the invention. bringing such a requirement will hold relevance in determining the role of the AI and the human in the conception and execution of the invention, and also in ensuring the appropriate inventor is listed in the application. Further, the method of inventing may provide useful information to the public in that the public may adopt innovative methods of inventing to obtain a certain kind of output (i.e. an invention in this context). The use of different methods of inventing will allow the public explore the same and expand the scope of innovation.

ISSUE 5: GENERAL POLICY CONSIDERATIONS FOR THE PATENT SYSTEM

(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?**

In case a sui generis system is implemented an additional issue arises in ensuring the applicants to choose the appropriate system rather than a convenient system. The applicants should not choose to apply in one system on the basis of the certainty and risks involved in obtaining protection. For instance, if a separate system is created for processing and examining AI and human inventions, the applicants will choose to forward his application in the system that is more likely to grant him/her the protection. If one system requires a higher standard for invention, the applicants will inevitably choose the other system to obtain protection. Thus, considerations should be given to ensure the sui generis system holds its relevance in light of such behavior.

ADDITIONAL SUGGESTIONS

- An additional issue of liability for patent infringement can be introduced. For addressing the same issues on infringement by an AI, following question can be appended.

  On whom shall the liability be imposed in case an invention generating AI infringes upon the rights of a patent or IP holder?

  A possible example of patent infringement by an AI may include situations where the AI is capable of executing the output, i.e. the invention it generates. If invention generating AIs are configured to a manufacturing plant, say a flexible and customizable 3D printing farm, in a manner that allows the AI to manage, control, execute and manufacture its newly generated invention, a case for infringement can be made if the product so manufactured infringes upon a third party's patent. Thus, it is suggested that the issue of liability from infringement be also discussed in the context of patents.
- The **Issue 1 and Issue 2** can be reordered as the issue of inventorship and ownership only arise when AI generated inventions are included as patentable subject matter.

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