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Trends And Developments In Artificial Intelligence: Challenges To Patent Law

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Introduction

The impact of Artificial Intelligence (AI) on intellectual property (IP) law undoubtedly ranks as one of the most-discussed topics of 2020 among legal academics and practitioners. Following initiatives at **WIPO**, the **EPO** and several national IPOs (including the **UKIPO** and the **USPTO**), EU institutions have now also become active in this area. On 20 October 2020, the European Parliament adopted a **resolution** on IP rights for the development of AI technologies. In parallel, on 25 November 2020, the European Commission published a commissioned **study** on challenges posed by AI to the European IP rights framework.

The study, which was carried out by researchers at the **Institute for Information Law (IViR)** [the authors of this post] and the **Joint Institute for Innovation Policy (JIIP)**, examines the state of the art of copyright and patent protection in Europe for AI-assisted outputs in general and in three priority domains: science (in particular meteorology), media (journalism), and pharmaceutical research. The term “AI-assisted outputs” is used in the study to refer to productions or applications generated by or with the assistance of AI systems, tools or techniques. This post focuses on the patent law analysis of the study (for a overview of the study and of the copyright part, see [here](#) and [here](#)).

The use of AI systems in the realms of culture, innovation and science has grown spectacularly in recent years and should continue to do so. As noted by [Drexl et al](#), AI applications relevant for patent law might include, for example, technology for “the functioning of a self-driving car, optimisation of a car design, development of medical treatments, virtual assistants”. Although AI systems have become increasingly sophisticated and autonomous, our study assumes that fully autonomous creation or invention by AI does not yet exist, nor will it exist for the foreseeable future. The study, therefore, views AI systems primarily as tools in the hands of human operators.

AI and European Patent Law

In respect of European patent law, our analysis focuses on the [European Patent](#)

Convention (EPC), looking into a number of issues related to AI-assisted outputs: inventorship, ownership, novelty assessment, inventive step, sufficiency of disclosure, and the case study of drug discovery.

As our study demonstrates, the requirement that an inventor be named on a patent application means that one or several human inventors must be identified. Under the EPC regime, this is essentially a formal requirement. The EPO does not resolve disputes regarding substantive entitlement, which is an issue that is governed by national law. Following this approach, the EPO decided [two cases in 2020](#) (currently under appeal) where it considered that, because AI systems do not have legal personality, they cannot be named inventors on a patent application.

A human inventor typically has the right to be named on the application. Beyond this, inventorship and co-ownership are mostly a matter for national law. It should be noted, however, that as AI technology stands today, the possibility that an AI system would invent in a way that is not causally related to one or more human inventors (e.g. the programmer, the trainer, the user, or a combination thereof) seems remote. As technology stands, no immediate action appears to be required on the issue of inventorship at EPC level.

As regards patent ownership, there are at least three possible (sets of) claimants to an AI-assisted invention: the *programmer or developer* of the AI system; the *owner* of the system; and the *authorised user* of the system (who provided it with training data or otherwise supervised its training). Neither international law nor the EPC provide clear rules on how ownership of patents may be affected by this new type of AI-assisted inventive activity. It is therefore a matter for national laws. However, that might not require harmonisation as there does not seem to be a problem in establishing a sufficient connection between an AI-assisted invention and a patent applicant.

The granting of a patent requires that, as of the date of filing, *the invention must be new (novel) and involve an inventive step*. While the increasing use of AI systems for inventive purposes does not require material changes to these core concepts, it may have practical consequences for patent offices. AI systems enable qualitatively or quantitatively different novelty (prior art) searches, and the practical application of inventiveness may change as certain claimed inventions may be “obvious” to a person skilled in the art due to the increasing use of AI systems. Any future changes will likely emerge in legal decisions at European (EPO Boards of Appeal) or national levels where patents will either be upheld or not.

A patent application must also sufficiently *disclose* the invention. The “black box” nature of some AI systems may present challenges to this requirement. In that regard, it has been suggested that a mechanism to deposit AI algorithms be established, akin to that for microorganisms (the [Budapest Treaty](#)). Although it is as yet unclear that a deposit system for AI algorithms would be useful, it seems advisable to at least consider the possibility of requiring applicants to provide this type of information, while maintaining sufficient safeguards to protect all confidential information to the extent it is required under EU or international rules.

Finally, inventions that might otherwise be patentable might be protectable as trade

secrets under the [2016 Trade Secrets Directive](#), a topic for future research that is outside the scope of our study.

Conclusions and Recommendations

In light of the above, our study reaches the following conclusions and recommendations regarding European Patent Law, and in particular the EPC:

- The EPC is suitable to address the challenges posed by AI technologies in the context of AI-assisted inventions or outputs.
- When assessing novelty, national IPOs and the EPO should consider investing in maintaining a level of AI capability that matches the technology available to sophisticated patent applicants.
- When assessing inventive step, it may be advisable to update EPO Examination Guidelines to adjust the definition of the “person skilled in the art” and secondary indicia to track developments in AI-assisted inventions or outputs.
- When assessing sufficiency of disclosure, it would be useful to study the feasibility and usefulness of a deposit system for AI algorithms and/or training data and models that would require applicants in appropriate cases to provide information that is relevant to meet this legal requirement.
- For the remaining potential challenges identified, it may be good policy to wait for cases to emerge in particular before national courts to identify actual issues that require a regulatory response, if any.
- Further study of the role of alternative IP regimes to protect AI-assisted outputs, such as trade secret protection, [unfair competition](#) and contract law, should be encouraged.

Final Remarks

In sum, the study concludes that the current state of the art in AI does not require or justify immediate substantive changes in patent law in Europe. The existing concepts of patent law are sufficiently abstract and flexible to meet the current challenges from AI. Producers of AI-assisted outputs also have access to alternative regimes, such as trade secret protection, unfair competition and contract law.

The main conclusions of the IViR/JIIP study were adopted by the European Commission in the [IP Action Plan](#) that was submitted to the European Parliament and the Council on the same day the study was published, 25 November 2020.

Part of this blog post is adapted from a previous blog post on the IPKat Blog ([here](#)) and the Kluwer Copyright Blog ([here](#))

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