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RE: Request for Comments Regarding the Impact of the Proliferation of Artificial Intelligence on Prior Art, the Knowledge of a Person Having Ordinary Skill in the Art, and the Determinations of Patentability Made in View of the Foregoing.

Docket No: PTO-P-2023-0044

Prepared by

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Please consider this response as public and citable.[2]

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[1] *This submission draws upon research conducted by Alia Kahwaji, a PhD candidate at the University of East Anglia, examining the impact of artificial intelligence on the patent system. The evidence presented here is based on her PhD research and prize-winning research paper presented at The British and Irish Law Education and Technology Association (BILETA 2024). The research paper is submitted for review and will be available shortly. This response addresses two key areas from the inquiry: AI's influence on prior art and its effect on the Person Having Ordinary Skill in the Art (PHOSITA) criteria.*

[2] Suggested reference: A Kahwaji, 'Response to the USPTO Request for Comments Regarding the Impact of the Proliferation of Artificial Intelligence on Prior Art, the Knowledge of a Person Having Ordinary Skill in the Art, and Determinations of Patentability Made in View of the Foregoing' (2024) 29 July.

A. The Impact of AI on Prior Art

The remarks presented here address questions 1-5 of the above subsection.

The language of 35 U.S.C. 102, which pertains to the assessment of novelty, implies a presumption of human involvement, particularly in the inventive process and act of seeking a patent. Terms such as "person" and "inventor" suggest that the statute was written with human actors in mind. Additionally, traditional interpretations and analyses of the patent system have been built around the concepts of a human inventor and human-made knowledge or prior art.

Non-human disclosure represents a relatively new consideration in patent law and should not be addressed in isolation from the context and rationales of the patent system as a framework. The statute does not explicitly address disclosures authored by non-humans, such as artificial intelligence (AI). Therefore, the application of 35 U.S.C. 102 to non-human-authored/AI disclosures (if identifiable) may require further legal interpretation. The statute primarily focuses on the availability and nature of the disclosure rather than its source. This lack of explicit mention of non-human authorship leaves room for interpretation as technological advances. Consequently, AI-authored disclosure could qualify as prior art under Section 102 if it meets the criteria of being publicly available before the effective filing date of the claimed invention.

However, this principle has several significant implications. Although AI-generated disclosures are not inherently problematic, the manner and quantity in which AI can generate disclosures could hinder the fundamental purpose of the prior art test, which was built on different assumptions regarding publishing and incremental knowledge progress. Traditional patent law and systems were designed based on the understanding of a human inventor who follows an inventing process that involves building on hypotheses, synthesising existing knowledge, and demonstrating ingenuity in relation to human cognitive capabilities.[3] As the concept of the 'inventor' evolves, it can be argued that the current understanding of an inventor's routine work should be extended to include the use of broad problem-solving tools such as AI.[4] This is because AI tools are useful in creating combinations and permutations that inventors can develop further.

The scope of prior art is already widened when it comes to AI-related inventions. Indeed, prior art information traditionally existed in textbooks summarising the latest state-of-the-art in the field. However, AI's rapid rise has accelerated the spread of public information, such as YouTube tutorials, academic articles, datasets and analytical reports, software code and algorithms, and patent grants.[5] Nonetheless, this does not mean that AI-generated disclosures should automatically be considered part of the prior art, since prior art is limited to the knowledge of the PHOSITA (Person Having Ordinary Skill In The Art). More importantly, consideration of AI-generated content must align with the underlying aims of the patent system as a whole. This leads us to the necessity to think how and to what extent would/could the PHOSTA interact with such content and whether such content is factually a 'public available knowledge' and verifiably creating advancement in the field of art.[6] Another question is whether generative AI disclosures, such as those produced by Generative Pre-trained

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[3] Ben Dickson, 'There's a Huge Difference Between AI and Human Intelligence—So Let's Stop Comparing Them' TECHTALKS (21 August 2018) https://bdtechtalks.com/2018/08/21/artificial-intelligence-vs-human-mind-brain accessed 28 July 2024. See also M Bultman, 'Patents and Artificial Intelligence: An "Obvious" Slippery Slope' Bloomberg Law (October 2021) https://news.bloomberglaw.com/ip-law/patents-and-artificial-intelligence-an-obvious-slippery-slope accessed 28 July 2024.

[4] D Kim, M Alber, et al., 'Ten Assumptions About Artificial Intelligence That Can Mislead Patent Law Analysis' Max Planck Institute for Innovation & Competition Research.

[5] N Shemtov and G A. Gabison, The inventive step requirement and the rise of the AI machines in R Abbott (ed), Research Handbook on Intellectual Property and Artificial Intelligence (Edward Elgar Publishing 2022).

[6] L Yordy, 'The Library of Babel for Prior Art: Using Artificial Intelligence to Mass Produce Prior Art in Patent Law' (2021) 74 Vand. L. R. 521.

Transformer (GPT) outputs such as texts, art, codes, etc., qualify as publications for the purpose of prior art definition. Consequently, disclosures based on AI-generated prompts cannot be guaranteed to be consistent or reliable for researchers and experts in the field as the designated PHOSITA. This inconsistency makes it difficult to empirically determine whether a PHOSITA has accessed and understood the generated content, and whether such AI-generated outputs meaningfully contribute to advancements in the relevant field.

Distinguishing between supervised outcomes of such tools and unsupervised outputs is one of the suggestions made in this consultation. However, implementing this differentiation is challenging. For example, verifying and tracing the date and source of the disclosures and the level of human involvement and supervision if identified as AI-generated might be a complex exercise that requires a pre-implemented traceability and transparency framework that cannot be said to exist within the current framework.[7] Turning to AI, Generative AI is incapable of causation, but it has great potential for correlation.[8] This can mean that without human guidance and intervention, AI generated outputs should not automatically be deemed part of prior art given that it is incapable of 'causing' or producing trustworthy new information or incrementally building on existing knowledge. Furthermore, the nature of the 'agent' where these processes take place is a decisive element in relation to the human-centric framework of Patent and inventorship laws. The human contribution moderator, only if traceable with defined thresholds, can contribute to a better understanding of whether the publication under scrutiny is expected to be available for the PHOSITA and whether it contributes to public common knowledge.

The volume of information generated or stored by AI compared to human cognitive capacity cannot be said to be compatible nor comparable.[9] Generative AI can flood the public domain with generated content, which can be used strategically to prevent patenting in certain areas.[10] Indeed, the USPTO and courts generally assume that a published document that qualifies as prior art contains sufficient detail to enable a person skilled in the art to practice the subject matter disclosed even if it has some technical gaps.[11] With such assumptions about enablement and operability combined with the lack of accuracy and trustworthiness of AI-generated disclosures, it is safe to argue that the assumption about enablement must be revisited.

Finally, calls to automatically include AI-generated disclosure in prior art and comparing AI-generated disclosure to human-authored disclosure is problematic in nature. Such calls suggest a potential shift from a human-based patent system to one that incorporates nonhuman elements. It is suggested that such shifts are not an adequate response to the current challenges facing the patentability criteria.[12]

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[7] Deirdre K Mulligan, Daniel Kluttz, and Nitin Kohli, 'Shaping Our Tools: Contestability as a Means to Promote Responsible Algorithmic Decision Making in the Professions' (2019) Preprint available at SSRN 3311894.

[8] P Vadapalli, 'AI vs Human Intelligence: Difference Between AI & Human Intelligence' UPGRAD (15 September 2020) https://www.upgrad.com/blog/ai-vs-human-intelligence accessed 28 July 2024.

[9] Ben Dickson, 'There's a Huge Difference Between AI and Human Intelligence—So Let's Stop Comparing Them' TECHTALKS (21 August 2018) https://bdtechtalks.com/2018/08/21/artificial-intelligence-vs-human-mind-brain accessed 28 July 2024.

[10] See for example, All Prior Art https://areben.com/project/all-prior-art/ accessed 26 July 2024.

[11] Manual of Patent Examining Procedure, Chapter 2100, Section 2121, 'Prior Art; General Level of Operability Required to Make a Prima Facie Case' [R-08.2017].

[12] A Kahwaji, 'Safeguarding Human-Centric Patent System: The Case of the Inventive Step Test' (2024) under review Manuscript.

B. The Impact of AI on a PHOSITA

The remarks presented here address questions 6, 7, 8 & 11 of the above subsection.

The PHOSITA is legally designed as a hypothetical figure, loosely defined to accommodate various fields and technological advancements. This fictional character is presumed to be aware of all the relevant prior art available to the public. Court decisions and patent offices in different jurisdictions currently uphold human-centric principles,[13] emphasising the human nature of the inventor and its reflection in the conception of the PHOSITA.[14]

One role of the PHOSITA in relation to invention disclosure, among others, is to ensure that the disclosure contains sufficient and enabling details for the PHOSITA to use and replicate the invention under scrutiny. When courts and tribunals define the PHOSITA, they consider characteristics such as the educational background and level of experience in the relevant field.[15] While these attributes are crucial for assessing the patentability and enablement criteria, the use of AI tools in the inventive process introduces a new, often overlooked element that should influence how PHOSITA attributes are determined. To effectively create and use an invention, PHOSITA needs access to the necessary AI tools involved in creating inventions in different fields. To successfully make and utilise an invention, the PHOSITA requires both access to and familiarity with the tools of the trade.[16] A PHOSITA cannot recreate a described invention without at least a basic understanding of such essential tools, how they are being employed in the field and how accessible they are. This understanding sometimes necessitates direct access to the tools themselves. Accessibility to these tools is a separate consideration from PHOSITA's education or general experience in the field and should be included in the PHOSITA definition.

However, current disclosure and enablement requirements do not mandate inventors to disclose the means by which the invention was conceived.[17] This lack of clarity and transparency regarding the tools used in R&D can hinder subsequent innovations. For instance, an inventor using advanced AI tools and models gains an advantage in making discoveries that will not be reflected in the knowledge and skills of the PHOSITA in the field. Additionally, follow-up inventions may be blocked because of the lack of accessibility to these tools or losing the ability to build on meaningfully enabling patent disclosures in the future. The varying complexities of AI tools and the methods employed in the inventive process can create gaps and inequalities in patenting practices.

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[13] See for example, U.S. Patent and Trademark Office, Inventorship Guidance for AI Assisted Inventions, 89 FR 10043, February 13, 2024. See also the Supreme Court decision in the UK in Thaler v. Thaler v Comptroller of Patents, Designs and Trademarks [2023] UKSC 49. See generally, R Matulionyte, AI is not an Inventor': Thaler v Comptroller of Patents, Designs and Trademarks and the Patentability of AI Inventions' (2023) Modern Law Review.

[14] In *re Winslow*, 365 F.2d 1017, 1020 (C.C.P.A. 1966).

[15] Klarquist Patent Defenses 'Person Having Ordinary Skill in the Art ("PHOSITA") *(*11 January 2024) <https://klarquist.com/patent-defenses/person-having-ordinary-skill-in-the-art-phosita/> accessed 29 July 2024.

[16] See on this J R Goodman Esq. 'Defining PHOSITA: Access to AI Tools and Patentability Standards', Frontiers Policy Labs (2024), available at < https://policylabs.frontiersin.org/content/defining-phosita-access-to-ai-tools-and-patentability-standards>, accessed 28 July 2024.

[17] See on this our recommendation in 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.

Conclusion

The impact of AI on patentability is becoming an increasingly significant issue, gaining attention in different domains such as academic research, litigation, and public policy. It is crucial to approach assumptions about AI capabilities with caution, particularly when interfacing with human-centric systems, such as patents. The patent system should retain its human-centered nature.

Patentability criteria are complex and interconnected; examining or modifying one aspect, such as the PHOSITA or prior art, should not occur in isolation from the broader patentability framework. In response to the proposed questions, I suggest the following:

- **Prior Art:** This situation presents an opportunity to rethink the focus of prior art, as interpreted in Section 102, shifting from mere availability in classic textbooks to a more practical evaluation of PHOSITA's interaction with prior art.

- **PHOSITA Skills:** The skills attributed to PHOSITA should be updated to incorporate not only publicly available AI tools but also sophisticated, exclusive tools. This cannot happen without updating and revisiting the disclosure requirements including the enablement element.

- **Disclosure Requirement:** The assumption of enablement in the disclosure requirement needs to be revisited to require inventors to disclose the AI tools used to make and use the invention described in the patent application.