AI as a Tool for IP Protection or IP Law Molded by the AI Boom?

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Abstract

As artificial intelligence becomes more widespread, its role in intellectual property management – especially in trademark research and patentability – is expanding rapidly. Due to advanced image recognition softwares, technology offers new opportunities in trademarking, as artificial intelligence makes trademark research faster and more efficient. Still, its added value, future, and regulation remain unclear. In patent law, answering the age-old question of the patentability of machine inventions is more important than ever. AI systems question and challenge the long-standing doctrines of the PHOSITA requirement, non-obviousness, the inventive step and maybe even patent law itself.

Keywords: artificial intelligence, trademark, patent, TRIPS, AI Act, PHOSITA, European Patent Office.

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„The most effective way to manage change is to create it."

Peter Drucker[1]

1. Introduction

Imagine a world where Andy Warhol made his first *pop-art* creation using artificial intelligence (hereinafter: AI), and Leonardo da Vinci asked ChatGPT the key elements of an everlasting painting.

We do not have to go really far to collect more tangible examples in connection with AI and science. In Stanley Kubrick's *2001: a Space Odyssey,* AI played a major role as an immensely useful but also dangerous tool. As we could observe throughout the storyline, AI's malfunctions raised philosophical questions about the trust we place in AI, its potential for autonomy, and the ethical implications of creating machines with intelligence that might surpass human understanding.[2] In Dune, AI is banned after sentient machines dominated humanity, prompting their destruction and a subsequent societal shift. As a result, humanity arrived at the view that AI – just like in *Space Odyssey* – is dangerous and unethical, and the humans of the *Dune* prohibited the use of "thinking machines", or any form of AI. The famous line from the book clarifies the statement: "*Thou shalt not make a machine in the likeness of a human mind.*"[3]

Apart from the artistic imagination surrounding the dangers inherent in AI described above, ideally, with AI handling routine tasks, humans can focus on more complex and creative roles. We know from experience, that AI can automate repetitive tasks like data processing, boosting efficiency, productivity, and accuracy.[4] It is highly relevant that AI has started making a mark in creative and industrial fields such as music composition, art, writing, or even technical solutions. While AI can generate impressive works in these fields, it raises questions regarding the role of human creativity and the ownership of AI-created contents for the near future. Many have claimed that AI is the next groundbreaking technology that will propel humanity

1 Peter Drucker, *Managing in the Next Society: Lessons from the Renown Thinker and Writer on Corporate Management,* St. Martin's Press, New York, 2003.

2 Arthur C. Clarke, *2001: a Space Odyssey,* New American Library, New York, 1968.

3 Frank Herbert, *Dune,* Chilton Books, Philadelphia, 1965.

4 Andy Johnson-Laird, 'Neural Networks: The Next Intellectual Property Nightmare?', *The Computer Lawyer,* Vol. 7, Issue 3, 1990, pp. 7–16.

into the next phase of evolution, transforming our lives in a way similar to how the internet reshaped the 20th and 21st centuries.

When any revolutionary innovation or concept emerges, its legal implications and applications often face the most scrutiny. In case of AI and intellectual property rights we expect the same, meaning that AI becomes a major focus for intellectual property systems worldwide, raising a host of new questions, discussions, and challenges.[5] This paper focuses on the field of industrial property rights, mainly analyzing AI's increasing effect on trademark law and patent law through the use of AI in practice, and the challenges raised by AI. Our aim is to stimulate debate on the impacts that this groundbreaking revolution brings on the table.

2. Living Revolution: AI's Effect on Trademarks

2.1. AI's General Effects on Trademarks

As trademark registrations continue to rise worldwide, brand owners are facing greater challenges in securing a distinctive and meaningful trademark that doesn't conflict with existing marks. Additionally, once a unique trademark is acquired, they must remain vigilant for potential infringements on their established portfolios. This highlights the crucial need for thorough trademark research before registration and ongoing monitoring afterward.[6]

In 2019 WIPO unveiled an enhanced AI-driven technology that appears to leverage advanced machine learning to analyze various features in an image, helping to identify similar registered trademarks.[7] Experts and users of the AI-powered search tool, accessible for free to all practitioners via WIPO's *Global Brand Database,* experienced more precise and tailored search outcomes, leading to reduced labor costs. Beyond WIPO's tool described above, AI-assisted search is advancing through various other methods and tools.[8] For instance, a 2019 article in the World Trademark Review introduced *TradeMarker,* an AI-assisted system, aimed at offering improve-

5 Aswin Pradeep, 'Artificial intelligence and intellectual property: potential and challenges', *Indian Journal of Law & Legal Research,* Vol. 3, Issue 1, 2021–2022, p. 2.

6 Ronda Majure, 'Al and Image Recognition: The Next Generation Brand Protection?', *The Journal of Robotics, Artificial Intelligence & Law,* Vol. 2, Issue 4, 2019, p. 6.

7 Agrata Jain *et al.,* 'Trademark law and AI's impact on it', *Indian Journal of Law and Legal Research,* Vol. 2, Issue 2, 2021, p. 52.

8 Ulrich Paschen *et al.,* 'Artificial intelligence: Building blocks and an innovation typology', *Business Horizons,* Vol. 63, Issue 2, 2020, pp. 147–155.

ments over other AI-based search platforms. The *TradeMarker* service enhances AI-driven image searches by organizing search results into four categories: subject similarity, pixel similarity, text similarity, and manually specified similarity criteria.[9]

Using free and easily accessible databases or search engines for trademark searching and clearance may appear to be a cost-effective solution for a brand owner, but it can ultimately be detrimental, leaving the brand exposed. Resources often fail to cover all relevant marks or search areas, lack expert guidance or analysis, and cannot provide the level of customization necessary to ensure a comprehensive and thorough search.[10] AI however can examine a wider range of images and interpretations to compare a specific trademark against, expanding the search and providing more opportunities to understand an image's meaning. This approach ensures that the results are as precise as possible, reducing the chance of overlooking any relevant marks.[11]

As of the date of completion of the present article, the image search tool of the European Union Intellectual Property Office's (hereinafter: EUIPO) seems rather unhelpful in case of some image similarity searches. When inserting a portrait of one of the co-authors to run a similarity search, the EUIPO search tool resulted in several hits, ranging from the infamous 'Uncle Sam' figurative mark,[12] through an 'Arvid Nordquist' coffee bag label[13] to the 'iSales mobile' figurative trademark,[14] all of which have only one thing in common: they have some kind of a figure or face on them. Based on this empirical evidence, we can ascertain that this particular search tool still has a long way to go. In this development AI will be indispensable (as we are of the view that the portrait input in the search tool does not look like the above referenced results).

2.2. The Role of AI in Transforming Trademark Registration Processes

By leveraging AI capabilities, businesses and legal entities can address the challenges of traditional trademark registration methods, creating a more

9 Id.
10 Id.
11 Id.
12 *See* at https://euipo.europa.eu/eSearch/#details/trademarks/014714901.
13 *See* at https://euipo.europa.eu/eSearch/#details/trademarks/018856885.
14 *See* at https://euipo.europa.eu/eSearch/#details/trademarks/012560991.

efficient, reliable, and responsive system.[15] Traditionally, this process has depended largely on human involvement, leading to inefficiencies, delays, and the risk of error. However, the emergence of AI has brought a new wave of innovation, presenting unique opportunities to transform trademark registration systems.[16]

(i) The essence of AI as a toolkit. The immense amount of data and information available online can make it difficult to perform thorough trademark searches and clearances manually. AI-powered tools can greatly improve the efficiency and accuracy of this process, when algorithms sift through large databases, detect potential conflicts, and offer valuable insights. These tools save time, while minimizing human errors, and assist businesses in making informed decisions when selecting and safeguarding their trademarks.

(ii) The accuracy of AI. AI's capacity to process data with remarkable precision reduces risks linked to human error. Traditional methods, on the other hand, depend largely on manual input and interpretation, which raises the chance for mistakes. Trademark searches are essential for a successful registration, ensuring a proposed mark doesn't clash with existing ones and complies with legal standards. AI has greatly enhanced the speed and accuracy of these searches, making it an indispensable tool for businesses.

(iii) AI-powered techniques. There are numerous AI-powered techniques, that can be used during the registration process, such as *natural language processing, machine learning,* and *computer vision;* all used to automate and enhance different stages of the trademark registration process. From initial trademark searches and clearance to application drafting, examination, and prosecution, AI-driven systems promise to streamline workflows, reduce conflict risks, and improve the accuracy of trademark assessments.[17]

(iv) Steps for the AI-based registration. There are five steps when it comes to AI-based registration in general. Firstly, the AI-driven search and clearance tools use *natural language processing* and *machine learning* algorithms to perform thorough searches of trademark databases and other pertinent sources, in which these algorithms analyze textual data related to trademarks to detect similarities, semantic connections, and potential conflicts.

15 Ananth Raja Muthukalyani, 'Analyzing the Adoption and Influence of AI in Retail Supply Chain Operations', *International Journal of Artificial Intelligence Research and Development,* Vol. 1, Issue 1, 2023, pp. 43–51.

16 Id.

17 Sundaram Balasubramanian, 'AI-powered trademark registration systems: streamlining processes and improving accuracy', *International Journal of Intellectual Property Rights,* Vol. 14, Issue 1, 2024, pp. 3–6.

Then for the second step AI-driven systems can help draft trademark applications by offering smart suggestions based on historical data and legal requirements. The third step is AI tools examining applications and reviewing reports to evaluate their adherence to legal requirements. Fourthly, AI-driven monitoring systems constantly monitor trademark registrations and potential infringements across multiple channels, such as online platforms and marketplaces. Lastly, predictive analytics models use AI algorithms to predict trademark registration trends, foresee legal challenges, and offer strategic insights.[18]

2.3. Recent Cases of AI-related Trademark Infringements.

While the use of AI in trademarks is a growing tendency, the legal background, or framework of this development has not yet been established. Tamás Lábady (former vice president of the Hungarian Constitutional Court) once noted that "*the law always follows life*" – clearly a crucial point when it comes to legislation, but the swiftness of creating the applicable legal framework is is also a key factor.

In a recent case of the High Court of Justice Business and Property Courts of England and Wales', named *Getty Images (US) Inc. v. Stability AI Ltd.*,[19] proceedings were brought for copyright infringement, database right infringement, trademark infringement and passing off against an open-source generative artificial intelligence ('AI') company, which generates synthetic image outputs in response to commands entered by users. The claimants' complaint was that the defendant has scraped millions of images from the Getty Images websites, all without the claimants' consent, and used those images unlawfully as input to train and develop Stable Diffusion. Further, the claimants asserted that the output of Stable Diffusion is itself infringing, not least because it is said to reproduce a substantial part of the claimant's copyrighted works and, or bears the claimant's trademarks. In the case at hand, a judgment is expected this summer; however, even at this stage, the shortcomings that may arise from inadequate training of artificial intelligence are already apparent.

In an other case, the well-known and worldwide famous Barbie brand of Mattel came under scrutinity as a possible victim of AI generated contents.

18 Id.

19 *See* at https://www.judiciary.uk/wp-content/uploads/2025/01/Getty-Images-and-others-v-Stability-AI-14.01.25.pdf.

Mattel, Inc. holds the intellectual property rights to Barbie, which encompass trademarks, copyrights, and design patents as well. These protections extend to the Barbie name, the distinctive bright pink handwritten logo, Barbie's image, her clothing, accessories, fashion style, packaging, and even her narrative. Any images or videos that use or recreate appearance in derivative works in connection with arts under intellectual property protection may violate Mattel's rights. Some probably come across the viral 'AI Barbie' trend, where users generate Barbie-inspired avatars, images, and videos using artificial intelligence. These creations often showcase the classic Barbie aesthetic – lots of pink, bold makeup, glamorous fashion, and the signature look. To join in, users upload their own photos, and use AI apps or tools, such as LinkedIn headshot or TikTok effects.[20] They give prompts to the AI detailing what their Barbie version should include: outfits, careers, packaging style, and more. The result is a customized, Barbie-styled avatar often paired with witty or aspirational captions, using Barbie's trademark. As generative AI evolves and influencer culture continues to shape digital trends, the AI Barbie craze serves as a vivid example of how pop culture, law, and technology are increasingly overlapping, and at times clashing. We can say that plastic is not always as fantastic as it seems – depending on the legal context.[21]

3. Machine Inventions in Patents

3.1. Patents and AI

Whether or not AI can be the inventor of a patent, has already been and will surely be one of the most exciting questions to answer in patent law in the foreseeable future. With AI models becoming smarter by the day, it is vital that the governing legislation or at least the practice of the relevant offices follow. A crucial factor regarding whether an invention can be patent-protected is its ability to meet the patentability criteria such as novelty, involving an inventive step, and the potential for industrial application. Regarding the question of the inventive step (*i.e.,* non-obviousness), if an AI system struggles to determine novelty, the likelihood of creating innovations on existing

20 *See* at https://www.bbc.com/news/articles/c5yg690e9eno.

21 *See* at https://timesofindia.indiatimes.com/etimes/trending/barbie-box-trend-goes-viral-how-to-turn-your-photos-into-ai-doll-avatars-using-chatgpt/articleshow/120183105.cms.

models or concepts that are not obvious to a person having ordinary skill in the art (hereinafter: PHOSITA), becomes even more challenging.[22]

Patent law is an adaptable system, capable of accommodating immense technological advances. Burk compares today's AI revolution to the huge leaps of biotechnology some 30–40 years ago.[23] The technologies that once seemed sci-fi-like, are now considered state of the art. AI was once considered the same, but that has now changed. Owing to these advancements, the long-standing patent law system may be due for a review with the spreading of ever smarter AI technologies, which, contrary to the above cited biotechnological advances, need less and less human contribution. We also note that patent law has been found to be applicable to the advances of software, biotechnology and genetic research.[24] Due to the dynamic nature of the law, when trying to solve new issues arising from technological advances, apart from existing laws *(lex lata),* one must also consider future legislation *(lex ferenda).*[25]

3.2. Views on the Patentability of AI

The patent systems' main incentive is to trigger innovation; an inventor may be encouraged by the prospect of a financial gain during their inventive activities. Of course, the argument can be made that human nature is curious by 'design' and therefore needs no further motivation to invent. On the other hand, an AI model does not need an incentive to invent, as it has no 'curious nature' – unless of course, it has been programmed that way. AI has been used extensively in order to simplify the execution of basic functions and primarily to reduce human effort.[26]

This raises the question, would AI systems capable of invention be developed in a world where their output could not be patented? Would a patent protecting the inventing machine be enough of an incentive to create such a machine or would the machines' outputs also need to be eligible for patent

22 *See* at https://robohub.org/should-an-artificial-intelligence-be-allowed-to-get-a-patent/.
23 Dan L. Burk, 'AI Patents and the Self-Assembling Machine', *Minnesota Law Review,* Vol. 105, Spring, 2021, p. 302.
24 Liza Vertinsky, 'Reorienting Patent Policy Towards Responsible AI Design', *University of Maryland Legal Studies Research Paper,* No. 2024-09. p. 14.
25 William Chindrawa *et al.,* 'Revolution in Intellectual Property Rights: Artificial Intelligence as the Inventor of a Patent', *Anthology: Inside Intellectual Property Rights,* Vol. 1, Issue 1, 2023, p. 19.
26 Id.

protection?[27] If innovators have no means to secure the output of their AI systems, what incentive do they have? By contrast, if every invention made by an AI system is granted patent protection, this gives the inventor an undisputable and huge incentive to pursue the creation of a machine capable of such output.[28]

There are several arguments for and against the responses patent law may need to give to the current AI revolution. Vertinsky summarizes these options as follows: firstly, even though patent law has been known to react well to new technologies, the AI-issue may need a unique response. Secondly, we should leave patents strictly to human inventors. Thirdly, responding to the changes occurring in the innovation ecosystem and incentivizing the private sector innovation would come with some changes to the current patent law system. Lastly, AI neutrality, *i.e.,* attributing AI inventorship the same role as that of human inventors.[29]

We live in an age where the danger of AI and inventive machines rendering human inventorship and research redundant may be imminent. While automation that generates innovation benefits society as a whole, it may also contribute to unemployment, deepen financial disparities and decrease social mobility. This aspect makes the present industrial revolution different to the previous ones. And while patent law alone will not be the decisive factor in all the above issues, it will undoubtedly play a significant role.[30]

3.2.1. Inventorship and Inventive Step

The inventive process of an AI system differs greatly from that of a human ('traditional') inventor. As mentioned before, a smoothly running AI can reduce the lengthy and costly trial-and-error method of an inventive process to a data-crunching, automated task,[31] it simplifies our lives, as does every tool humans have been using since the wheel.[32]

When discussing AI inventorship, we can pose the question 'Are we really talking about Artificial Intelligence systems'? Burk is of the opinion that the

27 Gaétan de Rassenfosse *et al.,* 'AI Generated inventions: Implications for the Satent System', *Southern California Law Review,* Vol. 96, Issue 6, 2024, p. 1458.
28 Id. p. 1459.
29 Vertinsky 2025, pp. 13–14.
30 Abbott 2018, p. 51.
31 de Rassenfosse *et al.* 2024, p. 1458.
32 Burk 2021, p. 310.

use of the term AI is a misnomer, as the systems we commonly refer to as AI are no more than machine learning routines, that possess no cognitive abilities and prospect. He argues that 'computer science has given up on building machines that can think in favor of machines that can learn'.[33] AI systems capable of generating outputs that seem unforeseen for humans may be taken as a sign of the cognitive abilities of the AI system, however such emergent outputs have long been around in several technical fields, *e.g.,* chemistry and biotechnology.[34]

An invention involves several crucial factors that determine whether a patent can be granted; however, certain criteria must be met for someone to be recognized as an *inventor.* While computers, which cannot feel emotions, are not motivated by such incentives, humans will continue to be driven to develop these technologies, recognizing the benefits of patent protection.[35] Patents are primarily intended to protect the inventor and acknowledge their personal contribution and connection to the invention, preventing others from exploiting it without restriction. Opponents of granting patent protection to AI-made inventions argue that computers lack such attachment, making them unable to have strong opinions on how their inventions should be used, thus undermining the fundamental purpose of patent protection.[36]

From a formalist perspective, one can argue that a machine cannot be considered as the inventor, since it has no mind in which the idea can be conceived. This is the core of the American patent legislation's approach to inventorship. In the landmark case, *Townsend v Smith,* the Court of Customs and Patent Appeals stipulated that "conception of the invention consists in the complete performance of the mental part of the inventive act."[37] Conception therefore has to be a definite and permanent idea of the inventor, and it should be applied in practice in the invention.[38]

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33 Id. p. 303, and Marion Fourcade & Kieran Healy, 'Seeing Like a Market', *Socio-Economic Review,* Vol. 15, Issue 1, 2017, p. 24. The present article's scope does not cover the distinction and etymological differentiation between the use of the terms 'AI' or 'machine learning systems' and only uses 'AI'.

34 Burk 2021, p. 304.

35 Ryan Abbot, 'I think, therefore I invent. Creative Computers and the Future of Patent Law', *Boston College Law Review,* Vol. 57, Issue 4, 2016, p. 1095.

36 Id.

37 Burk 2021, pp. 306–307, and *Townsend v Smith,* 36. F.2d. 292 (C.C.P.A. 1929).

38 Yuan Hao, 'The Rise of 'Centaur' Inventors: How Patent Law Should Adapt to the Challenge to Inventorship Doctrine by Human-AI Inventing Synergies', *Journal of The Patent and Trademark Office Society,* Vol. 71, 2024, p. 64.

Patent law has been known to allow the patenting of 'accidental' inventions, when conception is simultaneous with reduction to practice. In such cases the inventor's role is to recognize the desirable qualities of the discovery (or invention). We can imagine a similar approach when an AI comes up with a solution that is recognized by the human element of the equation. It is inconceivable that a human present during the accidental discovery of a desirable molecule is not recognized as the inventor. This approach, according to Professor Burk, may be applied to outcomes from AI (as he says, machine learning) systems, which only become inventions after they have been perceived as useful by a human operator.[39] In case of AI-related inventing, the procedure seems to have more than one stakeholder most of the time.[40] However, how deep do we need to dive in recognizing the player? Do we only recognize the operators or should we go back all the way to the programmers and trainers of the AI system?

The above perspective poses the question: since AI inventors are different in so many ways from humans, should they be treated differently? If we start treating AI inventions differently from 'traditional' inventions, we can be sure that inventors and other stakeholders will quickly find ways to characterize their inventions as non-AI in order to circumvent the different treatment to obtain a potentially stronger protection. Such a differentiated treatment may also require a *sui generis* IP right, which would shake the patent system at its core. And even if we argue that separating different types of inventions is cost-free, such a distinction would quickly bring us back to the above issue where inventors circumvent the AI-related rules and claim inventorship on their own.

Hao argues that in order to resolve the issue with inventorship of AI, policymakers have three choices: first, leave inventorless inventions (*e.g.,* those, where the AI is the inventor and therefore patentability is challenged) in the public domain; second, fundamentally change the patent system to accommodate AI inventors; or third, update the long-standing doctrine of inventorship to allow the patentability of these inventions.[41] However, this last option would make such institutional changes to an internationally harmonized field, that it should only be considered if the goal of patent law as an innovation motivator can be safeguarded. A different approach could be to treat AI-related inventions similarly to software-related inventions. An in-

39 Burk 2021, pp. 307–308.
40 Vertinsky 2025, p. 16.
41 Hao 2024, p. 69.

vention with no technical features, *e.g.,* a neural network or its learning method itself is only used as an alternative to a data processing method previously disclosed in prior arts, it should not be regarded as fulfilling the requirement of the inventive step. However, if it includes a special technical feature rather than a substitution of previously known methods, the inventiveness criteria should be considered to have been met.[42]

Lastly, some argue that if one country opts to establish a new patent system, it could also raise issues connected to the international treaties governing patent law, such as the Trade-Related Aspects of Intellectual Property Rights (hereinafter: TRIPS).[43] TRIPS established minimum requirements for patent protection, by stating that "patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application".[44]

3.2.2. Non-obviousness and the PHOSITA[45] Requirement

Is everything obvious for an AI system? What is obvious for the PHOSITA? Can we allow AI inventorship to potentially raise the bar for non-obviousness so high, that even a PHOSITA, by whose standards patentability has been judged for decades now, will consider everything to be non-obvious? Or on the contrary, will a PHOSITA using AI render everything to be obvious?[46]

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42 Okakita Yuhei, *Patent examination practices regarding AI-related inventions: Comparison in the EPO, USPTO and JPO,* Munich Intellectual Property Law Center (MIPLC) Master Thesis, 2018/19, pp. 35–36.

43 de Rassenfosse *et al.* 2024, pp. 1467–1469.

44 Agreement on Trade-Related Aspects of Intellectual Property Rights, Article 27.1.

45 As per the TRIPS Agreement, "Members shall require that an applicant for a patent shall disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art." (Article 29 TRIPS). The same requirement is set forth in the legislation of the US, the specification of an invention shall be made in such a way that enables "*any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same*" [35 U.S. Code § 112(a) In General]. Lastly, the Hungarian Act XXXIII of 1995 on the Protection of Inventions by Patents similarly states that "An invention shall be considered to involve an inventive activity if, in regard to the state of the art, it is not obvious to a person skilled in the art." [Hungarian Patent Act, Section 4(1)]. Based on the above, a person having ordinary skill in the art (the 'PHOSITA') can be regarded as a universal measure for assessing the novelty or non-obviousness of an invention.

46 de Rassenfosse *et al.* 2024, p. 1466.

If the use of AI can make everything obvious, assuring technical success without risk, cost or time-considerations, would we still need to issue exclusive patent rights? Burk argues that the above issue would deem patents obsolete and we could "enjoy the utopia of research certainty that AI ushered in."[47] However, he argues that obviously AI does no such thing[48] and that machine learning systems only find what human contributors intend and design for them to find within pre-specified statistical parameters.[49] Furthermore, the patent law term 'obvious(ness)' is not synonymous to 'obvious to try' a particular inventive combination of elements. In several fields unexpected (and therefore inventive or novel) results can often come from obvious combinations and can be eligible for patent protection nonetheless.[50]

Abbott asserts that if the PHOSITA requirement fails to evolve and follow the technological advancements of the AI revolution, it will result in setting the threshold for patentability too low. Keeping the skilled person in line with the actual practices and real world applications of AI is vital, and it must be done before inventive machines become commonplace[51] – if that did not already happen. Once such machines become the standard in research – which we may argue has already happened – the need may also arise for patent offices to require disclosure of the use of AI inventors.[52] The current standard can be problematic when the need to ascertain what another person found obvious, which results in 'inconsistent an unpredictable non-obviousness determinations' for policymakers, lawmakers and persons applying the applicable legislation as well.[53] This can put an even greater burden on legal professionals, especially judges with no technical expertise, who can find themselves in the position of ruling on complex technical issues. Of course this issue can be resolved by appointing judges who have relevant technical backgrounds, as do the Boards of Appeal of the EPO,[54] but until this becomes the standard legislative and judicial practice, judges will need to rule based on a subjective perception of obviousness.

It also has to be borne in mind that through the use of AI and inventive machines, 'average workers' may also become capable of creating patentable

47 Burk 2021, p. 309.
48 …yet… – the authors.
49 Burk 2021, pp. 309–310.
50 Id. p. 310.
51 Ryan Abbott, 'Everything is Obvious', *U.C.L.A. Law Review,* Vol. 66, Issue 2, 2019, p. 5.
52 Id. p. 6.
53 Id. pp. 6–7, and 42.
54 *See* at https://www.epo.org/en/case-law-appeals/organisation/technical-boards-of-appeal.

innovations, which can pose further questions about the use of the long-standing PHOSITA requirement.[55]

An emerging argument regarding patentability of AI inventions is the turn in examination practices towards secondary, economical features of an invention and reproducibility. The latter would focus on answering whether the inventive machine could reproduce the subject matter of the patent application with ease. However, if we argued that determining what another person finds obvious is hard, how hard can it be to Abstractly imagine what a machine could reproduce? AI systems highly depend on available data, but what about data that is not publicly available? Abbott argues that as machines develop and become more advanced, they will be able to achieve more complex results using less data. A computer generating semi-random output, if given unlimited resources, would eventually be able to produce an invention that may be deemed patentable. At any given time, there are several inventions that humanity is capable of discovering or making[56] (meaning that the technical knowledge and means are available and advanced enough). In other words, if a 'normally-skilled' AI could have created a proposed invention, does that render the invention invalid? If yes, this could raise the bar for the PHOSITA requirement,[57] as above discussed. Maybe not the only, but possibly the most important question to answer remains, how long are we willing to wait for mathematically and scientifically possible inventions to happen (or be discovered)?[58]

The US Supreme Court tried to supplement the *non-obviousness* a long time ago with 'real-world' evidence of the reception of an invention in the marketplace. It can be argued that such an approach may need to be revisited for accommodating AI inventions and their relation to the PHOSITA and *non-obviousness* criteria. The features that would need to be examined instead of or in addition to the well-known criteria are those of commercial success, unexpected results, long-felt but unsolved needs, and the failure of others, as well as those of licensing, professional approval, initial skepticism, near-simultaneous inventing and copying. The widespread use of inventive

55 Abbott 2018, p. 6.

56 de Rassenfosse *et al.* 2024, p. 1463.

57 Id. p. 1464.

58 Abbott 2018, p. 7, and 41–43. This approach may be interpreted as a twist on the classic *'infinite monkey theorem'.* The 'infinite monkey theorem' states that if you give a monkey a typewriter and let it hit the keys at random an infinite amount of times, it will eventually write down the entire works of Shakespeare. (*See* at https://www.theguardian.com/science/2023/mar/20/can-you-solve-it-the-infinite-monkey-theorem). But how long should we wait for something patentable to be found among the huge amount of random output?

machines could spark the use of these economic factors in assessing patentability.[59]

Finally, further to the question of whether machines are capable of performing an inventive step, we need to keep in mind the question: would an invention be recognized as such, if the PHOSITA weren't present? Do we consider AI inventors or inventor machines to be so 'smart' that they are capable of recognizing their own work as patentable or is the PHOSITA still essential?[60] In Indonesia, this question has been answered as follows:

> "If AIs are unable to file an Application on its own, it would be impossible for an AI to have its invention patented but if an AI is able to autonomously file an Application on its own, as our Law is silent on non-human Applicant, very clearly the AI filing the Application can be deemed as an Applicant."[61]

We believe that in the coming years policymakers, competent courts and institutions will play an essential role in developing a somewhat uniform set of requirements that harmonizes patentability criteria with the unprecedented technological advancements.

4. Conclusion

Rene Descartes[62] was a groundbreaking mathematician, scientific thinker, and original metaphysician. In *The Discourse on the Method,* he described nonhuman animals as machines without minds or consciousness, thus lacking sentience. He argued that it must be morally impossible that there should exist in any machine a diversity of organs sufficient to enable it to act in all the occurrences of life, in the way in which our reason enables us to act.[63] In the seventeenth century, Descartes found it unimaginable that machines could function like humans. By contrast, Alan Turing[64] was one of the early thinkers to explore the possibility of learning machines. Turing's

59 Id. pp. 44–46.
60 Id. pp. 47–48.
61 Chindrawa *et al.* 2023, pp. 19–20.
62 Gary C. Hartfield, *Routledge Philosophy GuideBook to Descartes and the Meditations,* Routledge, London, 2014, p. 22.
63 Id.
64 David B. Fogel, *Evolutionary Computation: Toward a new Philosophy of Machine Intelligence,* Wiley-IEEE Press, London, 2005, p. 4.

most notable achievements were the series of articles and public lectures on the topic of machine intelligence. In his seminal article *Computing Machinery and Intelligence*[65] he introduced the well-known imitation game[66] and pondered the question, if machines are able to think or not. Although Turing had the foresight to envision computers designed to simulate intelligence, he still viewed them as learning machines.

Handling AI and industrial property rights is not an easy task. When it comes to legislation, we can observe that the two fields are mostly discussed separately, leaving the users and stakeholders without any safety belts. The AI Act[67] does not directly address IPRs. The EU is still exploring the possibilities of AI and since there are several unresolved legal and ethical debates on AI and IPRs, there is still no settled legal framework, there is no universally accepted definition of AI in legal contexts. Current legal and regulatory frameworks in various jurisdictions are making innovative attempts by incorporating technical aspects along with goals or objectives. The European Parliament declared that the notion of 'AI systems' should be clearly defined, harmonized with international organisations for legal certainty and flexibility, distinguishing AI from simple software and excluding systems defined only by human-set rules.[68] Reinforcing the previous statements, in the AI Act, the concept of AI system is defined as

> "a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments."[69]

It is clear that having a practical and clear definition of AI is crucial for regulation and governance, as laws and policies rely on a definition for effective implementation and oversight.[70]

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65 Alan Turing, 'I.-Computing Machinery and Intelligence', *Mind,* Vol. 59, Issue 236, 1950, pp. 433–460.

66 Also known as the '*Turing test*'.

67 Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (hereinafter: AI Act).

68 AI Act, Recital (12).

69 AI Act, Article 3(1).

70 *See* at https://theconversation.com/why-we-need-a-legal-definition-of-artificial-intelligence-46796.

The current position of AIs under IP is however still problematic, wherein, recognition of work generated by Al is a step towards the future, but its implementation is the real problem.[71] While there is a clear distinction between the inventor and the invention, the rise of AI systems requires that lawmakers address whether AI-enabled systems should be included in this category. As the use of these technologies grows and the solutions they generate become more widespread, the issue of protection becomes a crucial concern.

71 Tripathi Swapnil & Ghatak Chandni, 'Artificial Intelligence and Intellectual Property Law', *Christ University Law Journal,* Vol. 7, Issue 1, 2018, p. 96.