DEFENDING THE NATURAL PERSON: WHY AI-GENERATED OUTPUTS SHOULD REMAIN UNPATENTABLE

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ABSTRACT

The use of artificial intelligence (AI) in creating new technical products has presented a new set of difficulties for patent eligibility. In line with recent decisions of courts and patent guidelines, which have set that patentable inventions must be those of a natural person, this paper supports this standard. We believe that patents cannot be granted for AI outputs and we do not wish to see the AI itself as inventors, but instead, human thought as the foundation for what can be patented. This paper does not enter into philosophical discussions, but rather takes a pragmatic and consequence-oriented perspective to explore the practical implications of AI patentability.

Patent flooding, or a mass of low cost, AI-generated patents, would result in patent thickets and thus increase the level of non-obviousness, we argue, leading to a chaotic situation. Inventive human minds, with limited mental resources and time, would never be able to outpace the speed at which generative algorithms can compute. Such change would inevitably squelch the creativity of people in creation of new ideas, discourage investment in research and development, and create an unequal, hyper-competitive environment for those who have the resources to run the largest computer.

Finally, we conclude that the natural person requirement continues to be an essential structural protection for the IP system. The patent system is a social compact that values the work of humans and the investment of capital and time resources; it's not a social compact when the output is so simple that it can be algorithmically generated and the capital required for investment comes from the public sector. A "creators first" approach to patent eligibility creates a fair and balanced innovation environment. This method works against anti-competitive concentration of the market; maintains the public domain; and ultimately safeguards long-term economic growth.

Keywords: Artificial intelligence, AI, Research and development, R&D, Inventorship

Introduction

The advent of artificial intelligence (AI) into research and development has created significant challenges to the concept of traditional IP, leading to critical questions and concerns regarding the patentability of AI-assisted research and development outputs. The current legal doctrine, bolstered by recent decisions from around the world, and new patent office guidelines, holds that patentable inventions are those of a natural inventor.

This Research paper is in accord with this consensus, and affirms the need for human activity as a precondition for the acquisition of patents. The current legal boundaries are confirmed, and the systemic risks of changing these boundaries are reviewed, while proposing that the human-centric requirement is not an outdated legal trivia, but rather an important regulating mechanism. Instead of philosophical or theoretical discussions about machine consciousness or legal personhood, our focus is on the real-world implications of granting AI systems patent protection. We propose to reject the patent application for AI-generated outputs because granting such patents would trigger a “patent supermarket”, with an unprecedented influx of inexpensive, machine-written patent applications to the patent offices. Such a wave of "massive patenting" would make it even more difficult for human researchers to get patents, as it would make the definition of non-obvious more stringent.

In effect, human creativity would be underrepresented because individual inventors and small companies would not be able to compete with the quickly and resource-hungry computational power of automated systems. Finally, we believe that the human-inventor principle should continue to be the foundation of the contemporary system of IP to ensure the fairness of innovation and sustainable economic growth. As a result, any AI-generated creations are promptly released into the public domain, where they can be explored, improved, and expanded upon by human creators. This means that a few major companies with the resources to deploy large computing power cannot control access to the basics technologies, and this balance and competition keep the marketplace in check. The human touch of patent law will always ensure that it continues to reward real human effort, real strategic investment and that the economic system is not disrupted by automated monopolies.

DABUS and the Case for Maintaining Human Inventorship

Innovation is the key driving force in contemporary economic and social development. Patents

encourage and sustain innovation by allowing the rights to the inventor of a technical solution to a specific problem to be granted for a limited period of time, creating a monopoly.[1] This is a grant of monopolistic rights that is given in return for publishing and understanding the invention to an average skilled practitioner in the art being pursued.[2]

In most legal systems, the original inventors are the ones entitled to apply for and be the owners of a patent. But at times other entities not the primary inventors do get rights to apply for a patent by operation of law. For instance, when an employer hires an employee to create an invention, he or she may be entitled to file a patent for the invention under the employer's employment agreement. Despite the fact that employers would have the right to file a patent in such a case, under today's laws, it would be a requirement to include the identity of the original inventor in a patent application.[3] This is because the proper identification of the inventor is significant in the allocation of the moral rights that can be derived from a patent, as well as in determining who has the right to patent. For example, an employer could not file for a patent for himself, unless he had an employee who was the actual inventor, or another person who was not an employee but was the actual inventor.

This system has worked fairly well in the era of inventorship by human beings only. The advent of artificial intelligence (AI) and especially the integration of AI into the research and development (R&D) process, and its ability to create output with little or no human involvement, has reignited a worldwide discussion around the definition of an "inventor.

In this way, the test cases presented by Stephen Thaler on behalf of his AI system, DABUS, exemplify this tension. Thaler is a computer scientist who has developed the DABUS AI system to help with the process of invention. According to him, DABUS, without his help or direction, came up with at least two patentable ideas: a new food container with fractal shape, and a new flashing emergency beacon. Thaler filed world-wide patents claiming that he invented the patents for DABUS by himself and that DABUS is the actual inventor.

So far, however, no authorities have been seen to accept these assertions regarding patent systems anywhere in the world, except in South Africa. In December 2023, the U.K. Supreme

[1] Matthew Fisher, *Fundamentals of Patent Law: Interpretation and Scope of Protection* (Hart Publishing 2007).
[2] Craig Allen Nard, *The Law of Patents* (Aspen Publishers 2008); John Barker Waite, *Patent Law* (Princeton University Press 1920).
[3] Erica Fraser, 'Computers as Inventors – Legal and Policy Implications of Artificial Intelligence on Patent Law' (2016) 13 SCRIPTed 305.

Court decided that the Patents Act 1977 only provides for natural persons as possible inventors, and therefore DABUS's inventions may not be patented in the U.K.[4] The United States Court of Appeals for the Federal Circuit (Court of Appeals), similarly to the Boards of Appeal at the European Patent Office (EPO), made it clear that the inventor must be an "individual," which it defines as a natural person, under the Patent Act.[5] The petition for a writ of certiorari was denied by the United States Supreme Court, and thus the federal court's determination stood. In February 2024, the United States Patent and Trademark Office (USPTO) issued guidance on inventorship to confirm that inventions made by AI are not patent ineligible but are only patentable when a human is considered an inventor because patents are intended to "encourage and reward human ingenuity".[6]

As some legal scholars and AI supporters suggest, what this legal consensus leaves us is an AI generated product in a disadvantaged position, but why this paper argues in favor of the legal consensus. We believe that AI systems should not be considered patentable "inventors" in patent law, and that the traditional definition of "inventor" as a human being is essential to the sanctity of the patent system.

In particular, this paper advances three arguments against AI inventorship:

The Nature of Incentives: Patent law is fundamentally about the incentive to employ human labor, investment, and intellectual risk-taking. Economic or legal incentives are not required nor can they be applied to AI systems.

Legal and Moral Coherence: An inventor must have legal personality, in order to have moral rights and to assign property rights in a legal way. The grant of non-sentient code an inventor would create a legal vacuum in terms of accountability and transfer of ownership.

The risk of AI being named as an inventor is that it could lead to a surge of AI-generated patents being filed in the patent offices, reduce the standards for ""obvious,"" and eventually displace smaller businesses and human inventors.

We show that restricting “inventor” to a natural person is not an anachronism, but a threshold

[4] *Thaler v Comptroller-General of Patents, Designs and Trademarks* [2023] UKSC 49.
[5] Patent Act, 35 USC.
[6] US Patent and Trademark Office, 'Inventorship Guidance for AI-Assisted Inventions' (2024) 89 FR 10043.

to ensure that patent systems remain public goods.

The Consensus of the Statutes and Judges

Before one can see why AI can't be considered an inventor, it is essential to review the worldwide statutory and judicial environment. The rulings on the DABUS patent applications have delivered a remarkably consistent body of jurisprudence across almost all significant IP jurisdictions, which further underscores the close relationship of inventorship with natural personhood.

The United States: "Individuals" and the Requirement of Natural Personhood

Under the Constitution's authority to "promote the Progress of Science and useful Arts" by granting "the exclusive Right to their respective Writings and Discoveries" to authors and inventors for "limited Times," the statutory definition of inventorship is provided by the Patent Act of 1952 (Title 35 of the U.S. Code).[7]

In *Thaler v. Vidal (2022)*[8], the United States Court of Appeals for the Federal Circuit directly considered the issue of AI inventorship, and its analysis was based on the plain language of the Patent Act. Pursuant to the definition of "inventor" set forth in 35 U.S.C. 100(f), an "inventor" is "the individual or, in the case of a joint invention or discovery, the individuals who together invented or discovered the subject matter of the invention. In addition, § 115 stipulates that an applicant for a patent must file an oath or declaration stating that "such person believes himself or herself to be the original inventor. Moreover, § 115 provides that an applicant for a patent must file an oath or declaration certifying that "such individual believes himself or herself to be the original inventor.[9]

Federal Circuit relied on Supreme Court precedent in *Mohamad v. Palestinian Authority* [10](2012) that the ordinary meaning of "individual" in federal statutes is a "natural person" unless Congress indicates otherwise, and noted that there was no indication in the text or legislative history of the Patent Act that Congress intended to extend the definition of "individual" to non-human entities, software, or machines. The meaning of U.S. patent law was

[7] Patent Act of 1952, 35 USC.
[8] *Thaler v Vidal* 43 F 4th 1207 (Fed Cir 2022).
[9] 35 USC § 115.
[10] *Mohamad v Palestinian Authority* 566 US 449 (2012).

further solidified in April 2023, with the United States Supreme Court rejecting Thaler's petition for a writ of certiorari, thereby affirming the Federal Circuit's decision that emphasized a human-centric approach.[11]

In February 2024, the United States Patent and Trademark Office's (USPTO) Inventorship Guidance for AI-Assisted Inventions further confirmed that the use of an AI system alone does not make an invention unpatentable, but a patent may only be granted if a natural person made "a significant contribution" to the conception of each claim in the patent application.[12]

The United Kingdom Supremacy Act 1977

Section 7 and 13 of the Patents Act 1977 were the key sections in the appeal, which was heard in the United Kingdom in the Supreme Court in Thaler v Comptroller-General of Patents, Designs and Trademarks [2023].[13]

In Thaler's appeal, Lord Kitchin, giving the unanimous opinion of the UK Supreme Court, rejected the appeal on three clear grounds contained in the Act:

- Under the Patents Act 1977 (as a whole) only people (not entities) can be inventors. To qualify as an "actual deviser," a person must be human and have legal rights and agency.[14]

- No Legal Personhood: DABUS is a machine and not to be considered a legal person within the meaning of the Act, in its capacity of being an inventor.[15]

- No Right of Accession: Thaler didn't have the right to apply for the patent because he didn't own DABUS. The fruits of the intellectual property rights of intangible intellectual property rights do not belong to the common law owner of the physical asset, such as the farmer being the owner of the fruits of the cows he used for breeding, but he must be an inventor as recognized by law.[16]

The court's ruling in the UK Supreme Court gave little hope of any further move towards

[11] *Thaler v Vidal* 143 S Ct 1783 (2023) (certiorari denied).
[12] US Patent and Trademark Office, 'Inventorship Guidance for AI-Assisted Inventions' (2024) 89 FR 10043.
[13] *Thaler v Comptroller-General of Patents, Designs and Trademarks* [2023] UKSC 49.
[14] Patents Act 1977, s 7(3).
[15] *Thaler v Comptroller-General* [2023] UKSC 49 [50].
[16] ibid [52]–[55] (Lord Kitchin).

acknowledging non-human inventorship without a specific change to the law by parliament.

The European Patent Convention: Formal and Substantive Human Anchors

The Legal Board of Appeal (J 0008/20 and J 0009/20)[17] reiterated that the applicant has to specify the inventor in the application by naming a natural person under Article 81 and Rule 19(1) EPC.

The reason given by the Board was formal and substantive. Conceptually, Rule 19 EPC requires the names of the inventor(s) and their full address to be recorded on the application, which is impossible to apply to a software system.[18] Substantively, the Board stated that under Article 60(1) EPC the right to a European patent could not be vested in an AI system (which, by its nature, do not have legal personality) and therefore cannot be transferred or have a "successor in title.[19] Therefore, invalidating the whole concept of transferring ownership of the property, as is currently the case in the EPC, on the basis that it is an AI would make it impossible to work.

The Registration-Only Outlier: Understanding the South African Position

Despite the enthusiasm about AI inventorship, an examination of this development shows that it is not a conscious decision made by the Republic of South Africa, but rather a system anomaly. South Africa's Companies and Intellectual Property Commission (CIPC) is a non-examinating registry.[20] The CIPC is different from the USPTO, the UKIPO, or the EPO in that it does not do substantive prior art searches or validate the inventorship claims before granting. Applications will be reviewed only as to their formal compliance. Therefore, the granting of the patent for DABUS in South Africa was a ministerial act that was not a substantive legal endorsement of the AI as an inventor. A court in South Africa would probably find this patent invalid under the South African Patents Act 57 of 1978, which, throughout its text, makes the assumption that an inventor is a natural person with the capacity to assign rights to the patent.[21]

[17] EPO Legal Board of Appeal, Decisions in cases J 0008/20 and J 0009/20 (21 December 2021).
[18] European Patent Convention, Rule 19(1).
[19] European Patent Convention, Article 60(1).
[20] Companies and Intellectual Property Commission, *Patent Journal* (Vol 54, No 07, July 2021) 255.
[21] Patents Act 57 of 1978 (South Africa).

The Cognitive Threshold of Inventorship: The Doctrine of Conception

In addition to statutory texts, the main conceptual obstacle to consider AI as an inventor is the definition of the act of invention as itself. The "inventive act" is not bound by the physical or electronic realization or implementation of a design, but rather the cognitive doctrine of conception is the basis for the "act of invention" in IP law.

The Legal Anatomy of Conception is an overview of the legal aspects of conception.

The United States Court of Appeals for the Federal Circuit, in *Burroughs Wellcome Co. v. Barr Laboratories, Inc., (1994)*[22] held that:

The phrase “definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice,” is the definition that "conception" means.[23]

In order to conceive the mind must be in a mental state which is subjective and cognitive. It's not just a passive moment of a natural phenomenon nor a mathematical permutation that is generated automatically. It is a teleological process in which the human mind recognizes a technical issue, thinks of a particular form or procedure of solution and comprehends how the latter will function in the physical world to produce a helpful outcome.

A chasm exists between the idea of processing as conception and the prevalence of the conceptional approach.

No matter how complex an AI system's architecture is, they are not involved in conception. Modern AI algorithms work by performing sophisticated mathematical calculations, statistical analysis and pattern matching:

A generative AI model for finding drug compounds works by predicting the distribution of tokens or the molecular geometry based on a statistical weight, which is computed using the training data. It does not grasp the concepts of disease, of a human cell, or physical consequences of the molecules it proposes.[24]

No Desire to Solve a Problem: The AI has no motivation to solve a problem. It performs an

[22] *Burroughs Wellcome Co v Barr Laboratories, Inc* 40 F 3d 1223 (Fed Cir 1994).
[23] ibid 1228.
[24] John R Searle, 'Minds, Brains, and Programs' (1980) 3(3) Behavioral and Brain Sciences 417.

objective function which is programmed by humans. An AI doesn't "conceive" a container when it generates a novel fractal geometry for a food container, it has just optimized a spatial distribution algorithm in a mathematically-bounded set of boundaries.

Lacks a Subjective Mental State: AI is devoid of sentience and consciousness, giving it no cognitive "definite and permanent idea. It cannot go through the subjective transition from enquiry to realization which is a characteristic of man's invention.

The Human Factor in the Translation of Machines' Output

When dealing with any R&D pipeline that involves AI, the actual conception takes place when a human researcher reviews, evaluates and selects the outputs of the machine. This distinction is evident in the USPTO's 2024 Inventorship Guidance, which is based on the Pannu factors for joint inventorship in the past.[25]

In the field of AI-assisted inventions, the contribution of the “joint inventor” is identified with:

The creation of the Inquiry: Problem definition, choice of the specific data set and the prompt/constraints that govern the operation of the AI.

Evaluative Selection: Rejection of the output of the AI, which is typically noisy and raw, showing which of the outputs are technically feasible, and which of those are the actual compound or mechanism to be physically synthesized and validated.[26]

In the chemical and biological arts, conception and reduction to practice may happen at the same time (the doctrine of "simultaneous conception and reduction to practice") as the court explained in *Amgen, Inc. v. Chugai Pharmaceutical Co*. (1991).[27] For ten thousand molecular formulas suggested by an AI, conception would not be considered complete until a human researcher isolates the specific molecular formula, synthesizes the compound, and identifies the compound possessing the claimed biological activity.[28] The AI is only a hypothesis creator, the person is a conceiver and recognizes the invention.

[25] *Pannu v Iolab Corp* 155 F 3d 1344 (Fed Cir 1998).
[26] ibid 1351; US Patent and Trademark Office, 'Inventorship Guidance for AI-Assisted Inventions' (2024) 89 FR 10043.
[27] *Amgen, Inc v Chugai Pharmaceutical Co* 927 F 2d 1200 (Fed Cir 1991).
[28] ibid 1206.

Legal Personality, Property Rights and the chain of title

The third leg of the stake in the argument against AI inventorship is the structure of property law. A patent is not only a major point of pride and a school honor but also a highly regulated, state conferred exclusionary property right. The concept and operation of granting inventorship to an entity without legal personality is impossible in any legal system in the modern world.

This topic explores the legal issues surrounding the creation of property rights by machines. This topic considers the legal problems of machine-made property rights.

A property right is a right which must have a legal agent with whom it can be held by. There are two types of persons in the eyes of law: Natural persons or Human persons (Human beings) and Juridical persons or Corporate persons (Corporations, trust estates, state entities). Both classes are legally capable of conducting themselves in their contracts, having property, suing and being sued, and being legally liable.

There is no legal personality of an AI system. Under the law of property it is referred to as a chattel, that is an asset rather than a subject of rights. An AI cannot be the original patent owner as an AI is not a legal person.

This makes a chain of title that cannot be resolved. In the conventional patent practice, a patent right is generated by the inventor who then transfers it to a corporate employer/investor through contract. When the AI is the inventor, without the ability of the AI to own the property, the patent right is "ownerless. Rights cannot be assigned or distributed from a non-entity (AI) to a human owners.

Intellectual Property - The Fallacy of Accession

One way to circumvent this chain of title issue is to insist that the common law doctrine of accession should apply to the owner of the AI machine who thus obtains any patent rights created by the machine.

According to the Federal Court of Australia in *Commissioner of Patents v Thaler* (2022),[29] and the UK Supreme Court in *Thaler* (2023),[30] accession is a property doctrine that is applicable to

[29] *Commissioner of Patents v Thaler* [2022] FCAFC 62.
[30] *Thaler v Comptroller-General of Patents, Designs and Trademarks* [2023] UKSC 49.

material objects. It presumes that the right to enjoy natural or physical fruits of a principal asset is vested in the principal asset's owner, e.g. the owner of land would have the right to enjoy the fruits of nature (i.e. the land), such as the fruits of the earth (i.e. crops), and the owner of an animal would have the right to enjoy the fruits of nature (i.e. the animal), such as the fruits of their flesh (i.e. offspring).

Provision, however, also has been made in the case of the intangible intellectual property rights, however, that accession does not apply.

The school will ensure that students are aware of the concept of liability, accountability and inequitable conduct.

It is a big responsibility and legal obligation to name an inventor. For example, in the U.S., inventors have a strict duty of candor and good faith toward USPTO under 37 C.F.R. § 1.56.[31] This duty includes an obligation to provide USPTO with any information that is material to patentability. If a patent holder fails to do this, it may be deemed "inequitable conduct" and therefore the entire patent will be invalid.

These accountability mechanisms fail if an AI is acknowledged as an inventor:

- **Oath and Declaration:** An AI will not swear or take an oath it thinks it is the original creator.
- **Limits of Liability for Fraud, Misrepresentation or Failure to Provide prior art:** Liability of an AI for fraud, misrepresentation, or failure to provide prior art is excluded.
- **Contractual Enforcement:** An AI cannot be assigned to execute or be compelled by a court to become a witness in patent litigation. The law provides that the inventorship is limited to natural persons and that this limits the possibilities for abuse and fraud by other parties in patent prosecution, which enhances the integrity of the patent system.

Utilitarian Calculus: The Theory of Incentives

Patent systems are based largely upon the utilitarian philosophy. Patent law is not about

[31] Duty of Disclosure, 37 CFR § 1.56.

creating this new type of "public good" creativity; it is about regulating a market failure – the "public good" problem of innovation.

The Instrumental nature of the Patent Bargain

As the economist Fritz Machlup described it, a patent system is an economic trade-off, a "patent bargain"[32]: The state gives an inventor a valuable 20-year monopoly for excluding others from using his invention in exchange for public disclosure of the full details of the invention. This monopoly enables the inventor to recoup R&D costs, to set super-competitive prices and to rake in profits on their investment in IP. Otherwise, competitive markets may not pay enough attention to innovation to enable it because competitor firms could be able to copy new innovations without having to cover the underlying R&D costs.

Why algorithms cannot be incentivized. Why algorithms can't be incentivized.

An AI system has no regard for the economic benefits of patent law:

- **No Opportunity Cost**
- **Zero Marginal Cost of Generation:** The cost of running inference to produce new outputs from an AI model is negligible, after the model is trained.
- **An algorithm is a mathematical tool, there is no psychological motivation.**

They are an economic absurdity, allowing the patent of an AI system. It offers a reward to an entity which can't be rewarded.

Preservation of Human Capital and R&D Incentives

Those who advocate for AI inventorship contend that otherwise, companies will not invest in the development of AI technologies. But the point that this argument misses is that the economic incentive is not going to the taxpayer but to the consumer.

The idea behind the incentive of patent law is to affect human investors and human developers,

[32] Fritz Machlup, *An Economic Review of the Patent System* (Study No 15 of the Subcommittee on Patents, Trademarks, and Copyrights, US Senate, 1958) 5.

not the machine. The current human-centric framework provides for complete preservation of this incentive for humans:

- **The AI Systems Themselves:** AI system software, neural network designs and training algorithms belong to the category of computer implemented invention and are patentable.

- **Under the USPTO's "significant contribution" test,** as long as the human researchers remain actively involved in the R&D process, including setting the parameters for training the AI, designing the chemical library they use, and evaluating the raw outputs, they can still be deemed "inventors" of the final product.

The only case that isn't covered is when there is 0 IP addressage by the human researcher and the AI generates a solution from the beginning to end without any human oversight or selection. In this instance, it is a pure machine generation, with no human labor involved and, therefore, no human reward, and the public interest is best served by immediately putting the product into the public domain instead of being monopolized by a corporation under a patent.

Public Policy Risks: Computational Flooding, Obviousness and Corporate Capture

Regarding AI as the creator of inventions, it would pose very serious risks in terms of public policy, market competition, scientific development, and tech accessibility.

Risks in the first place are the so-called computationally caused patent flooding. Humans are naturally limited in their innovations by factors like cognitive capacity, while AI may produce billions of variations within hours. If a machine was recognized as inventor it would permit setting up an automatic system of submitting thousands of applications every day. This would not only overload the system, but also make patent law practically inaccessible.[33]

In the second place, the concept of PHOSITA would disappear. Assessing the level of invention at the PHOSITA level by using AI would significantly increase the baseline of what would constitute the level of ordinary skill.[34] As a result, innovations developed by human hand, especially by independent researchers and small businesses, would be considered "obvious"

[33] Erica Fraser, 'Computers as Inventors – Legal and Policy Implications of Artificial Intelligence on Patent Law' (2016) 13(3) SCRIPTed 305, 322.
[34] Patent Act of 1952, 35 USC § 103.

and therefore, not patentable.[35]

Besides, the change leads to, intellectual property rights grab. and, takeover by big companies. Large computing companies may block all patenting of a certain field in a preventive way. For example, in the case of drugs, a particular company could get a monopoly on all molecular structures of a protein family. This would have a negative impact on consumer prices, limit academic cooperation, and give only a limited number of players the power to direct technological progress.[36]

Limitations and Counter-Arguments

This paper argues that the patent ownership of an AI developed system should not be given to the AI, but it is important to confront the objections of those who argue for granting the patent to the AI and to recognize that such a system is not perfect. Those who have come up with the idea of AI inventorship, such as Ryan Abbott, say that denying the right for AI to be inventor would kill off innovation, foster secrecy, and leave a legal void for highly valuable, self-generated technologies.[37] This section explores these rebuttals and explains some of the actual constraints of the human-only inventorship role.

The "Patent Vacuum" and Threat of Trade Secrecy

One of the main objections to the human-centric consensus is that if AI-generated work is not protected by patent, it will lead R&D-driven businesses to relying on trade secret to protect their discoveries, instead of public disclosure. From this perspective, if a novel molecule developed by an AI system can't be patented due to the lack of a human inventor, then its developer will not share the formula with anyone else, as that would be a waste of their investment. This would destroy one of the core tenets of the patent system – the “patent bargain.”[38]

This is a valid concern but the potential for a general "trade secret vacuum", is perhaps an

[35] Ryan Abbott, 'I Think, Therefore I Invent: Creative Computers and the Future of Patent Law' (2016) 57(4) Boston College Law Review 1079, 1102.
[36] Shlomit Yanisky-Ravid, 'Generating Images of Creative Robots: Joint Ownership or Universal Public Domain?' (2017) 32(4) Harvard Journal of Law & Technology 191, 215.
[37] Ryan Abbott, 'I Think, Therefore I Invent: Creative Computers and the Future of Patent Law' (2016) 57(4) Boston College Law Review 1079.
[38] Matthew Fisher, *Fundamentals of Patent Law: Interpretation and Scope of Protection* (Hart Publishing 2007) 54.

exaggerated worry. In many industries, for instance in the pharmaceuticals sector or the aerospace sector, it is not a long term solution to ensure the trade secrecy. Trade secrecy proves to be ineffective once the product is in the marketplace and can be easily copied. This will likely lead developers to continue to attempt to patent these products by keeping humans firmly and meaningfully engaged in the product selection, refinement, and testing of AI's raw products.

Second, if any outputs of the AI are trade secrets, this could be a better policy choice than otherwise. Inventing patent monopolies for purely machine-generated outputs would enable corporations to snowball large chunks of technical space without much human labor, thereby "locking up" technical space that would impede rather than facilitate human innovation after the fact.[39]

A "Product-Focused" not "Process-Focused" Approach to Patent Law.

An equally strong opposition comes from the idea that patent law should measure the results of innovation, not how it is achieved. Proponents say that the social utility of an invention should be judged by novel and non-obvious industrial applications, and the identity or nature of the "creator" is not relevant.[40] In this view, it is nepotistic and outdated to force the existence of a human inventor, and this is not representative of the reality of today's R&D.

This argument is however confusing patentability with the legal function of inventorship. The concept of inventorship is subjective and it is based on a relation with the state of the art, but the assessment of patentability (novelty and non-obviousness) is objective and based on the state of the art. The legal mechanism that can be used to establish the origin of the title and distribute the moral and economic rights is inventorship. For a long time, the standard of inventiveness has been the ability to conceive, the mental act of forming a clear and fixed idea of the complete and operating invention. The ability to conceive, the mental act of establishing a clear and fixed idea of the complete and operating invention, has been the standard of inventiveness for a long time and is not a capability of an AI system.[41] A Machine has no mind

[39] Craig Allen Nard, *The Law of Patents* (Aspen Publishers 2008) 120.
[40] Ryan Abbott, *The Reasonable Robot: Artificial Intelligence and the Law* (Cambridge University Press 2020) 88.
[41] *Burroughs Wellcome Co v Barr Laboratories, Inc* 40 F 3d 1223, 1227–1228 (Fed Cir 1994).

of its own, it cannot be said to have any rights from which they can be legally transferred.[42]

The Risk of Concealment and Fraudulent Human Attribution:

One significant drawback of the human-only inventorship role is its enforcement challenges. However, if patent offices do not allow AI's to get patents on its creations, then applicants will simply cover up the parts that AI played in the research and development and claim it as their own. It is very challenging for patent examiners to catch such misrepresentation because they are mostly dependent on the statements from the applicant's declaration.

This restriction needs to be recognized. The temptation to "inventorship laundering" is great,[43] and patent offices aren't yet equipped with the forensics to determine what exactly each patent is the work of. But this is not a practical reason to call into question the fundamental legal principle of human inventorship. Rather, it highlights the need for:

- Stricter disclosure policies, including those included in the 2024 guidance issued by the USPTO, which mandate disclosure of whether AI was used in a way that could impact the inventorship.[44]

- Penalties on a severe note, including an invalidation of the patent for inequitable conduct, if an applicant is discovered to have misrepresented the human contribution during litigation and/or post-grant review.

Diversity of the policy-making process

Last but not least, if some countries stick to the human only rule, and others don't, as in South Africa where they have granted a patent with DABUS as the inventor,[45] there is a danger of legal fragmentation. Multinational companies can do “forum shopping,” meaning that they may file patents in jurisdictions where there are more liberal rules for AI inventorship, in order to obtain early patent application filing dates or broad protection.

[42] Erica Fraser, 'Computers as Inventors – Legal and Policy Implications of Artificial Intelligence on Patent Law' (2016) 13(3) SCRIPTed 305, 312.
[43] Richard Pearlman, 'Recognizing Artificial Intelligence (AI) as Inventors and Authors Under U.S. Intellectual Property Law' (2018) 24(2) Richmond Journal of Law & Technology.
[44] US Patent and Trademark Office, 'Inventorship Guidance for AI-Assisted Inventions' (2024) 89 FR.
[45] Companies and Intellectual Property Commission, *Patent Journal* (Vol 54, No 07, July 2021) 255.

Moreover, this paper recognizes that a system that does not include AI will pose a real regulatory challenge in the case of fully autonomous discoveries by AI that lack the "significant human contribution" requirement. The lack of direct patent-based incentives for a discovery may be temporary if an AI system is used to discover a cure for a disease, without direct human intervention.

But this shouldn't mean that society must create more alternative regulatory systems – like clinical data exclusivity, R&D tax credits, or direct state funding prizes – to encourage uncoordinated AI advances instead of simply tweaking the basics of patent law to fit non-human actors.[46]

Conclusion

The dispute related to AI content does not just amount to technicalities of law, but it is essentially the question of what the intellectual property system is all about. As AI takes the shape of various forms of research and development work, the idea of keeping a human being as the only person who can be inventor continues to be a good guardrail to our system.

This paper outlines some strong points of why giving a patent to an AI-invention would really shake the basic structure of the patent agreement. On economic terms, algorithms do not need and can therefore not be influenced by a monetary monopoly bestowed by a state. From a legal viewpoint, recognizing inventorship of non-sensual beings that have no legal personality is creating problems in the title chain that lead to ownership disputes, ethical accountability, etc. More importantly, the hazards to public policy, such as computationally generated patent spamming, redefinition of the non obvious requirement, and the risk of big companies monopolizing whole technical areas, far exceed the supposed advantages that would arise from a broader definition of inventorship.

Although trade secrecy and legal fragmentation, as well as the temptation to falsely attribute the AI work to the human are genuine, they can rather be mitigated through stricter disclosure standards, firm implementation and alternative regulation methods instead of the destruction of basic legal concepts on the patent law. By keeping inventorship solely at the human persons one is able to let the patent system keep on rewarding the humans' creativity while promoting fair commercial competition and keeping discoveries which are carried out by completely

[46] F Mazzi, 'Patentability of AI-generated drugs' (2020) 4(1) European Pharmaceutical Law Review 17.

autonomous machines in the public domain for society's further development. The intellectual property system must be a vehicle of human progress which ensures that even if machines become sophisticated, technology is still a means through which human beings can be empowered and not an autonomous means of gaining a monopoly.