The Response of:

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on

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1 AI AND PATENTS QUESTIONS

1.1 Should patent law allow AI to be identified as the sole or joint inventor?

The answer to the question of who should be recognised as the inventor of an invention that emerges from AI-machine does not elicit a straight answer. Current patent law contemplates two scenarios – sole and joint inventor. However, there could be as many as four possible claimants of AI-induced invention, viz: the inventor of the AI, owner of the AI (who could be the inventor or a firm or individual to whom the AI is licensed), whereas the AI is licensed, the licensee may engage an employee to operate the AI. In this instance, the AI-creator/inventor, the licensee of the AI, the AI-itself, the employee of a licensee who operates the AI, may, depending on how the AI was programmed and by whom, all have a direct or indirect legal basis for claiming inventorship of the AI-derived invention. The question as to which of these possible inventors of AI-derived invention should be assigned exclusive right of ownership by law patent will depend on the following scenarios:

Based on patent law's economic incentive theory persuasion, the original inventor(s) of the AI or a conventional technology should be recognised by patent law as the sole or joint inventor(s). It is unlikely that the original inventor of AI would find an economic reason to invent AI technologies in a situation where they are not entitled or jointly entitled to patents for secondary-invention emanating from their primary AI-invention(s). The incentive to invent would diminish, especially when the secondary patent(s) command(s) high market value compared to or more than the market value accruing from their original AI-invention. However, this argument would have no merit under the current UK patent law if the primary AI-inventor is not the programmer and therefore has no knowledge of how the programming manifested in the AI and how the programming culminated in the new AI-derived invention. The inventor of an AI-derived invention is licensed. Another entity and the AI-derived invention happened in the licensee's work environment and happened in a manner that the AI-inventor never envisaged would not be a legal foundation upon which the AI-inventor would stand to claim ownership of the AI-derived invention. Moreover, to the extent that the AI-inventor could not imagine what their AI invention is capable of inventing, it is unlikely the AI-inventor would be able to proof novelty, originality, inventive step and how the invention is fit for unique industrial application.

In a situation where the operator of a licensed AI is the only one who understands how they programmed the AI to generate the invention, it would be robbing the operator of their intellectual property if the patent law appropriates ownership rights to the AI-inventor. The incentive theoretical persuasion of patent law would favour the operator for combining their programming knowledge with AI to create new technology.

From the standpoint of the current UK patent law on employee inventions, the law bestows ownership of employee inventions to the employer. This implies that when an employee discovers an invention using the employer's AI technology, the employer belongs to the employer, subject to fair compensation to the employee by the employer. Any thought about joint ownership of the invention of a patent over AI-invention, relative to the employee invention law, precludes the AI licensor and the programmer/operator/employee, confines the possible candidates of joint ownership to the employer/licensee and the AI-inventor.

Unless AI can be accorded the higher status of legal personality or criminal liability and civil liability can be established under criminal law and under civil law, respectively; and unless AI is capable

of enjoying rights and performing obligations of an inventor under the patent law; it will be legally problematic for patent law to recognise AI as the inventor or assign patent rights to AI for AI technologies derived from it. The current UK patent law was designed with a human inventor mind. For the patent law to recognise AI as the inventor of an invention that emerged in the course of its application, it requires one of the following two approaches. The United Kingdom Government may consider.

i. either the current patent law is completely reformed to reflect attributes that qualify only humans as inventors, to recognise AI as inventors and relationship between them, with regards joint ownership of AI-induced inventions or;
ii. designing a specialised/separate patent regime for AI and AI-induced inventions to co-exist with human-oriented patent law.

As far as AI cannot determine by itself when its patent rights have infringed, when and how to pursue legal action in court against infringers or possible infringers of its patent rights, and what constitutes fair compensation when AI-induced invention is being held legally liable in court for infringing human rights.

1.2 Is there a moral case for recognising AI as an inventor in a patent?

The moral question or issue may arise from recognising AI as an inventor in a patent why AI, the creation of human intellect, should be elevated to the status of humans by according AI, intellectual property rights and other human rights. In the case of co-ownership of patents, it may psychologically be unsettling for some of the human co-owners to imagine that they share equal rights and entitlements with an inanimate entity - AI. Another moral question is about who owns the pecuniary benefits that accrue to the AI from the appropriation of the patent? Besides, is it humanly ok for the world to look on whilst AI becomes wealthy from the exploitation of humans with patent assigned to it by humans, albeit a society in which some people are homeless and lack other basic necessities of life?

If AI can be recognised as an inventor in a patent, it is not unthinkable to envisage the emergence of a situation where humans will become AI employees.

1.3 If AI was named as the sole or joint inventor of a patented invention, who or what should be entitled to own the patent?

In a situation where an AI is named as the sole owner of a patented invention, it requires a human agent to perform any obligations and rights of the AI provided in the patent act. Apparently, before sole ownership of a patent can be vested in an AI or an AI agent, it would have taken a human agent to make the public disclosure for patent grant purposes. Besides, a human-agent is required to prove beyond a reasonable doubt that the AI's invention is novel and useful for industrial application and meets the requirements of inventive step and poses no threat to public safety and security. It will require the same human agent to assist the AI to perform its rights and obligations, which arise from the patent grant. This human agent would either be the Government, the AI's patent owner, programmers of the AI's AI or licensed users. Moreover, the human agent must take responsibility for any legal liability incurred from the AI's patent's acts and omissions. The patent rights should be

vested in the human-agent, to whom entitlement of the AI's patent that possesses the most accurate and detailed technical knowledge about the AI's invention.

Under the current patent law (Patent Act 1977 amended), Section 36(1) – 36(2) entitle joint inventors or co-owners of a patent to "an equal, undivided share of the patent", and each has the right to appropriate patent to their benefit without the consent of the other(s). Section 36(3) prohibits anyone party to jointly own a patent from amending the patent to revoke the patent or unilaterally licensing the patent to third parties without the others' prior consent. Where AI is a co-owner of a patent, the human co-owner is expected to obtain the consent of the AI. Besides, AI is incapable of granting or obtaining consent in such a relationship. This implies the ability of the human co-owner to license the patent is foreclosed. Besides, AI is incapable of exercising its right to surrender, under Section 29, of the co-owned patent to the human co-owner(s). Since AI is incapable of seeking from or granting consent to a human co-owner, any transaction that requires consensus or mutual consent under the patent act will be numbed. This implies neither the human co-owner nor an external entity can act as the surrogate of the AI. The way forward is to the new set of rules to resolve these constraints and limitations.

Moreover, in a situation where the human co-owner is deceased but did not exercise their right, as granted in Section 36(5), to assign their entitlement to someone else, either by an agreement to that effect or by a written will, or was unable to surrender their entitlement, as granted under section 27, before their death, the AI will automatically assume sole ownership of the patent. If the AI becomes the sole owner of the patent, following the death of the human co-owner, and in the manner hypothesised above, it is unlikely that the AI will have the capacity to perform the patent's rights and obligations itself. It is not obvious from the patent act, which becomes the deceased successor of the patent. The suggestion forward herewith is that the entitlement of the deceased, in the given circumstance, resides in the people of the UK and the UK Government replaces the deceased as the co-owner. Where the AI itself was patented and owned by the deceased and the deceased doubled as the co-owner of a patent with their AI, both the AI patent and the jointly owned patent must be declared as public property manned by or brought under the custody of the Government, unless the successor of the deceased becomes obvious upon the death of the human co-owner.

Due to the above-mentioned under Section 29surrendering or relinquishing their ownership to human co-owner, joint ownership and the AI-inventor cannot obtain the consent of the AI to be the sole owner. Where their joint ownership between AI inventor and AI over AI-derived invention, the economic rewards that accrue to the AI, should be assigned to the Government/public and appropriated for public benefit. In this case, the Government should hold entitlement and act for the AI and thereby appropriate the economic benefits accruing to the AI, in the joint ownership, for public benefit. By so doing, Government and, invariably, the public would be incentivised to public research & development for the creation of more AI technologies. More preferably, sole ownership of the AI-derived inventions could be vested in the Government for the people whilst ownership of the AI itself remains with the inventor (the AI or human-AI, jointly) of the AI. They are still legally liable for the actions, except for inventions of the AI. This latter proposition could create a fairer patent regime than the existing one—legally personality and legal liability of AI.

1.4 Does current law or practice cause problems for the grant of patents for AI inventions in the UK?

Undoubtedly, current law or legal practice in the UK, especially in the legal fields of legal jurisprudence, criminal law, the law of tort, human rights law, labour law, succession law, and intellectual property law, have designed with humans in mind. Legal practices in these fields are premised on the knowledge that human beings have a conscience over their actions, inactions, and reactions. The laws are actionable on the grounds of legal attributes of human beings such as intent, mental health, and disability, which constitute the basis for determining legal liability, criminal intent, legal personality, and moral/ethical responsibility. In intellectual property law, where AI is legally grounded, there are legal complications in placing AI and AI inventions in the same stature as humans and human inventions. Humans are fallible and imperfect, and AI intelligence is bound to be inferior to human intelligence and imperfections of human inventors of AI are bound to be transferred to AI. Attainment or grant of consent is a key principle that permeates the design of the UK patent law, and since AI cannot seek consent from or grant consent to relevant entities in the appropriation of patents, there are legal complications with how to patent inventions can be solely owned by AI and jointly owned by two AI technologies or AI and a human entity. It is also difficult to determine ownership, rewards and compensations for employee inventions involving an AI and an employee who is an AI operator at the workplace.

1.5 Does the requirement for a patent to provide sufficient detail to allow a skilled person to perform an invention pose problems for AI inventions?

Potentially, there are bound to problems with providing sufficient details for expert development and commercialisation of AI inventions in instances wherein the entire intangible knowledge underpinning a given AI invention is exclusively generated by the AI and incompressible to skilled persons. Public disclosure of inventions, which is a prerequisite for the patent grant, can be performed by skilled persons from the field of art of the invention. It will require a human entity to discover an AI invention to initiate the patent application process for an AI invention to prove that the invention meets the fundamental requirements such as novelty, inventive step, industrial application, and public safety security. However, where technical details, required by the skilled person in the art of the AI's invention, are inaccessible or incompressible by the skilled person, it is unlikely that such an invention can be patented or developed due to the knowledge and security implications arising therefrom. Moreover, without detailed technical information underpinning the AI's invention, or where the technical information is found to be indecipherable to the patent granting authority, due to the constraints highlighted above, it may be problematic for the grant authority to determine whether a patent granted for an AI's invention or patent has been infringed upon by other AI technologies or has infringed other AI inventions and patents.

1.6 Who is liable when AI infringes a patent, particularly when this action could not have been predicted by a human?

It is very difficult to determine who should bear legal liability for legal infractions on human rights or IP rights of human and other AI technologies. It is even more difficult when the actions and omissions

of the AI are unpredictable. The attainment of the patent owner's consent is mainly prescribed under Section 60 of the UK Patent Act as the legitimate method for avoiding patent infringement or for seeking authorised use of their patent. However, AI as a non-human entity is incapable of seeking or granting consent. Consequently, the legal basis for proclaiming that an AI has infringed on a patent because it failed to attain the patent owner's prior consent is weak, if not unfounded.

Any attempt to place or impose legal liability on the AI inventor could lead to a situation where AI technologies are underproduced, or perhaps, the AI revolution truncates as a result. The incentive to invent AI technologies will disappear with the AI revolution if AI inventors are held liable for their AI inventions' capricious behaviour. The market for AI technologies will crush if licensed users of AI patents are held liable for patent infringements committed by AI unless it can establish that users masterminded such tortious actions. For instance, it may be easier to place legal liability on human-inventors and AI-inventors of AI technologies, which are designed and meant to be deployed for cyber warfare or military warfare, when they cause cybercrimes or human rights atrocities, than it is to assigned legal liability to human/AI inventors of AI technologies, which are intended for agricultural production if they stray off the original purpose of agricultural production or food processing by violating the patent rights of other human or AI inventors.

In view of the enigmatic legal ramifications that may arise from any quest to assign legal liability to human inventors, programmers, engineers, and users of AI technologies, for unforeseen legal infractions on other patents by AI technologies, insurance companies could step to assume limited legal liability. Residual legal liability can be assigned to inventors or users who are sufficiently apprehended in the act of deliberately masterminding the patent infringements being committed by the AI or who has, out of negligence, failed to ensure against the actions of the AI technologies.

2 AI AND TRADE SECRETS QUESTIONS

2.1 Is trade secret protection important for the AI sector? Does the nature of AI technologies and business influence your answer?

An AI revolution is bond to trigger a trade secret revolution, especially in the private sector. Private enterprises, as profit-maximising entities, may prefer AI-labour corporate regime to the status quo – human-employee regime - because AI technologies, unlike human employees, do not engage in industrial strikes, will not engage in unhealthy corporate politics, will not take salaries or demand for salary increments, will not observe lunch breaks or take annual/sick leaves, will not be affected by pandemics such as COVID-19 and future pandemics, and will pose a threat to the trade secrets of companies because they do not attend inter-firm workshops or industry conferences or change employers.

Besides, AI promise to more efficient, accurate and faster in the delivery services. In view of the preceding reasons, private companies are more likely to deploy technologies to displace human employees. However, the transition from a human-employee regime to AI technologies likely would result in a trade secret infringement crisis. Employee turnover rate in favour of AI technologies may lead to huge concerns the trade secret protection. When a substantial number of technical human employees are compelled to change employers because AI technologies displace them in the previous companies, the previous employers' trade secrets would be imminent. Trade secret protection

concerns may heighten during the transition from a human employee-based corporate regime to an AI technology-based corporate regime.

However, companies that have successfully migrated from a human employee based corporate regime to an AI-based regime would not bother much about the sanctity and protection of their trade secrets. In an AI-based corporate regime, companies' trade secrets would be disembodied from humans and embedded in AI technologies. AI technologies are social entities and, therefore, would not socialise with AI technologies of rival companies. Besides, companies would program their AI technologies to share with clients only information that will not jeopardise their trade secrets. The foreseeable threat to trade secrets under the AI corporate regime is a possible unprecedented increase in cyber-warfare between rival companies' AI technologies in their quest to obtain valuable confidential information.

The 2018 UK trade secret regulations are designed based on trade secret infringement actions that only humans can perpetrate. Regulation 2 of the Trade Secret Regulations specifically mentioned "person" as in its definition of trade secret "infringer" and also mentioned "persons" in Regulation 2(a) and 2(b) where the potential infringers of trade secrets are defined. Besides, Regulation 16, where compensations arising from established for infringement of trade secrets are payable to the "injured party", the Regulation therein referred to "person" as the liable infringer. In its current form, the Trade Secret Regulations do not recognise AI have as probable or potential infringers of trade secrets. Thus, disclosure or concealment of secrets are socially oriented actions performed by humans only, and this is reflected in the design of the UK 2018 Trade Secret Regulations.

The AI revolution may not be realised if the UK trade secret does not evolve to provide stricter protection of trade secrets during human labour transition to the AI labour regime. A substantial number of AI inventions are likely to manifest as computer software, which is not considered the patentable subject matter in patent law. This implies that AI technologies that exist as computer software would be preserved as trade secrets. The UK trade secret law needs to be expanded to cater for the allocation of legal liability in the case of trade secret violations by AI technologies. The trade secret law needs to be reassessed to determine if it is robust enough to resolve the transition periods' secret trade crisis.

2.2 What are the advantages and disadvantages of using trade secrets in the AI sector? Could information that is not shared inhibit AI development?

2.2.1 Advantages

The advantages of using trade secrets in the AI sector follows:

Companies that deploy AI technologies for the production and delivery of services do not need to sign confidentiality and non-disclosure agreements with AI technologies in their quest to protect their trade secrets. AI technologies would self-protect trade secrets embedded in them.

AI technologies would be changing employers in search of better remuneration and treatment. So companies that employ AI technologies do not have to both about trade secrets because of employee turnovers.

2.2.2 ***Disadvantages***

The disadvantages of using trade secrets in the AI sector follows:

Trade secrets may slow down the AI revolution because other potential AI inventor will not have access to technical knowledge; they may need existing AI inventors to invent AI technologies. Trade secret licensing would gain more impetus, and the cost of acquiring a license from AI inventors will serve as a disincentive and a barrier for potential AI inventors who do not have the wherewithal. Potentially, such trade secret access barriers could propel rival firms to engage in unethical access methods that may culminate in an unprecedented upsurge in trade secret infringements.

By using trade secrets in the AI sector, the stock of technological knowledge in the public domain would shrink substantially, and the inventive and innovative capacity of the nation will plummet as a result.

3 AI AND COPYRIGHTS

A historical analysis of copyright laws in the United Kingdom illuminates that only 'humans' have been considered 'authors.' For example, the Statute of Anne 1710 granted authors and their assigns the right to print books for a period of 14 years from the first publication. Subsequent copyright laws, including the Copyright Act 1911, the Copyright Act 1956 and Copyright Act 1988, have maintained the human authorship position. Furthermore, a crucial condition for the grant of copyright is originality. The United Kingdom test for originality is the author's skill, labour and judgement, while the seminal Court of Justice of the European Union case, *C-5/08 Infopaq International A/S v Danske Dagbaldes Forening* establishes that originality in copyright means the work is the author's own intellectual creation.' Artificial intelligence generated works are new aesthetic materials; however, machines and computers neither fully apply 'skill, labour and judgement' nor 'intellectual creativity' standards required for originality (an attendant question here is with the Brexit discussions, what is the status of CJEU case law in the UK?). Some further questions that arise include how a machine or computer can exercise economic rights. Drawing from the above, since computers and machines are non-humans and their works do not meet the thresholds of originality, I submit that the content generated by artificial intelligence should not be eligible for protection by copyright or related rights protection. In other words, these works should belong to the public domain.

References

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The Patents Act 1977 (as amended)

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