

# **An Appraisal of the Relationship Between Artificial Intelligence and Intellectual Property Rights**

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## **ABSTRACT**

*This research was carried out to discover if there exists a need to alter the existing intellectual property legislation in Nigeria because of the rise of artificial intelligence. Currently only a human has rights to intellectual property. That is why this is a research of if it could be changed in the future, or if it would be possible to create a legal vicarious effect between Artificial Intelligence (AI) and the owner of that technology to better facilitate works that are created by Artificial Intelligence. The issue is international, and because of that there is a comparison between the European Union (EU) and the United States' approaches to authorship, copyright and AI, to find out similarities and differences, if those would enable legal co-operation, or if it would prove out to be an impossibility in the current moment. The methods used in the study are qualitative and comparative legal research, based on journal articles and books published by legal scholars. The main results and conclusions that the study draws are, that there exists a need to adapt the existing intellectual property legislation to facilitate computer generated works in the future, and computers ought to be granted a special type of legal authorship, and there are several potential ways of assigning liability over computer generated works, out of which the author sees as the most potential one being using the principles of vicarious liability.*

**Keywords:** *Intellectual Property, Artificial Intelligence, Technology, Rights, Future.*

## **Introduction**

Artificial intelligence (AI) is one of the most important technologies of this era.<sup>[1]</sup> Once considered a remote possibility reserved for science fiction, AI has advanced enough to approach a technological tipping point of generating groundbreaking effects on humanity and is 'likely to leave no stratum of society untouched'.<sup>[2]</sup> Progress in AI has shown tremendous potential for benefitting mankind by improving efficiency and savings in production, commerce, 'transport, medical care, rescue, education and farming',<sup>[3]</sup> as well as for significantly cultivating 'the ability and level of social governance'.<sup>[4]</sup> But AI's technological advances are also expected to disrupt numerous legal frameworks, including various aspects of intellectual property law.<sup>[5]</sup>

English mathematician, Alan Turing introduced AI as a concept in a 1950 paper, and American computer scientist, John McCarthy coined the term 'artificial intelligence' during the Dartmouth Conference in 1956.<sup>[6]</sup> No single definition of AI is accepted by all practitioners. Some define it broadly as a computerized system exhibiting behaviour commonly thought of as requiring intelligence, whereas others define AI as a system capable of rationally solving complex problems or taking appropriate action to achieve its goals in real-world circumstances.<sup>[7]</sup> AI is often described based on its problem space, such as logical reasoning, knowledge representation, planning and navigation, natural language processing (NLP) and perception,<sup>[8]</sup> or based on its often-overlapping subfields, including machine learning (ML), deep learning, artificial neural networks, expert systems and robotics.<sup>[9]</sup> AI is also often categorized based on its intelligence level, such as artificial general intelligence (AGI), which is a notional form of AI that exhibits a level of intelligence comparable to that of the human mind, and narrow AI, which is the form of AI seen today that focuses on solving specific tasks.<sup>[10]</sup>

AI's technological breakthroughs dramatically accelerated in the last two decades, fuelled by advances in ML algorithms, exponential growth in the availability of data,<sup>[11]</sup> and improved and cheaper computing power.<sup>[12]</sup> The impressive technological progress of the last decade in particular has led to AI's ability to 'perform activities which used to be typically and exclusively human', as well as to develop 'certain autonomous and cognitive features' e.g. the ability to learn from experience and take quasi-independent decisions.<sup>[13]</sup> AI is now revolutionizing the way people live, work, learn, discover and communicate, putting them on the threshold of an era where increasingly sophisticated robots, bots, androids and other manifestations of AI are poised to unleash a new industrial revolution. It is against this background that this study investigates the impacts of artificial intelligence on intellectual property law.

## **Copyright and AI**

Copyright is an integral part of intellectual property rights. It is a legal right granted to the creator of an original work, allowing him/her exclusive rights for its use and distribution. The rationale and justification behind this were the notion that the author is an originator merged with Locke's economic theory of possessive individualism.<sup>[14]</sup> Generally, for a grant of a copyright, fulfilment of two essential features is required. Firstly, the work should be in a fixed form,<sup>[15]</sup> and secondly, it should be original.<sup>[16]</sup>

A copyright is exercised generally for literary and artistic works. Since one of the contemporary areas of AI's applicability is creation of literary works, the study of copyright in light of AIs, becomes relevant.

The ambiguity regarding the stance on AI is not recent and dates as far as the 1970's. For instance, in 1974, the U.S. National Commission on New Technological Uses of Copyrighted Works (CONTU) in one of its report stated that, the development of an AI with the capacity of creating an independent work is theoretical and not practical.<sup>[17]</sup> The U.S. Office of Technology Assessment (OTA) again revisited the issue in 1986 when it evaluated the implications of

rapid advancements in interactive computing on IP. OTA disagreed with CONTU and suggested AIs be considered as legitimate co-authors of copyrighted works.<sup>[18]</sup> Over thirty years from then, the debate surrounding AIs is still at its prime, wherein one side argues the inability of computers to be as creative as humans, whereas the other disagrees on the pretext of defining creativity.<sup>[19]</sup>

One of the sharp critics against AIs being granted protection is, Lovelace. She states that a machine lacks creativity due to its rule bound behaviour. The logic behind her theory being that, creativity is the ability to do the unpredictable, i.e., not following the usual routine, unlike something machines and computers always do.<sup>[20]</sup> The same is countered by authors terming writers as machines themselves, as they process existing works and deduce most of their works from pre-existing ideas. For instance, there exist multiple copyrights on movies based on the premise of ‘Romeo and Juliet’. Similar instances exist in the music industry too.<sup>[21]</sup> They rely on judgments like *Cummins v. Bond*,<sup>[22]</sup> wherein the Court was faced with an author inquiring whether a work can be registered in the name of Jesus. The Court held that, the non-human nature of the source of a work should not be a bar to copyright, regardless of any independent editorial judgment being exercised in the process. This judgment is stretched by the ones in favour of AIs, to include registration of the work done by AI, which is also non-human in nature.

Even if countries admitted to granting copyrights to the works of an AI, the question of who gets that copyright remains cryptic and difficult to fathom. This is because the current status of law requires a legal personhood of a right holder, something which an AI lacks, unless its creator is granted that on its behalf.<sup>[23]</sup> However, there does exist a loophole in the same, which is with respect to what happens if the AI system was a purchase, whether the copyright will be granted to the creator or the buyer. This answer lies in favour of the creator, in countries like England and New Zealand, where the copyright in works authored by AI is given to the programmer, through legal fiction. Legal backing to the same is provided in the form of expanding the definition of copyright, to include computer generated works (the ones that lack a human author, i.e., AIs).<sup>[24]</sup> However, this still does not answer the above question. Another problem with the current system is the nature of criminal liability of AIs. When AI was created, no one envisaged the wonders it would achieve, and it would not be unusual to expect the same to increase such that, AIs become an independent entity altogether in the future. A pertinent question regarding possible criminal liability of an AI will then arise.<sup>[25]</sup> If the current stance continues, it will be the creator who is liable, despite him lacking the *mens rea* or *actus reus* of such an act. Therefore, the present position of AIs under IP law has certain loopholes.

## Patentability and AI

The interaction between Patent laws and AI is increasing in today’s technological world. As illustrated earlier, AI has been used extensively in order to simplify the execution of basic functions and primarily reduce human effort. At a quick glance, AI enabled systems come across as working in a fashion akin to simple calculators and such gadgets. However, it functions in a much more complicated manner. Today, AI enabled systems are equipped to perform tasks based on their own key learnings, creating the possibility of them inventing something. While this is a huge development from a technological standpoint, it poses new challenging questions from a legal standpoint, i.e., from the perspective of patent law.

A patent can be understood as the exclusive right over an invention. This ‘invention’ has been understood to cover any product or process, which provides to users a novel way of performing a certain action, including that which offers a new solution to an existing technical problem. The holder of such a right is entitled by law to exclude others from making, selling, or even using the patented invention for a limited term. Therefore, it can be said that the right guaranteed in such an instance legitimises the creation of a monopoly for the benefit of the original inventor.<sup>[26]</sup>

As established previously, AI enabled systems are equipped to perform functions and even create inventions, which ordinarily results as an outcome of the application of human cognitive processes. In fact, these machines are producing results which could qualify as patentable inventions.<sup>[27]</sup>

Under the Nigerian Patent Law, while an inventor is not specifically defined, it is clear from the wording of the Patents and Designs Acts that an ‘inventor’ is regarded as an individual or a set of individuals who invented or discovered the subject matter of the invention.<sup>[28]</sup> This eliminates any inference which supports the premise that legislative intention in the act sought to include inventions or rather the possibility of inventions being made by anyone besides humans. However, with increasing involvement of the AI systems in invention processes, such questions demand legal perusal. Such perusal can be witnessed faintly in the attempt by the European Union to encourage nations to expand their national laws generally, to accommodate copyrightable works produced by computer and other devices, under the category of ‘own intellectual creation.’<sup>[29]</sup> While this is a progressive step in the direction of acknowledging creativity exhibited by these systems, while producing poetry, artwork etc., due regard must also be paid to include inventions and application of patents by AI systems and robotics.

The European Parliamentary Committee has noted how, in a matter of a couple of decades, AI systems could surpass human intelligence in terms of performing functions, which uncontrolled, could pose challenges as to the manner in which these AI systems control and manage their own destiny.<sup>[30]</sup> Attention to patent rights is required when speaking of AI systems due to the high level of autonomy enjoyed by such systems. This autonomy, allows AI enabled systems to perform functions without any kind of significant human intervention. Therefore, this increasing functionality allows for these machines or programs to be employed at early research stages which can eventually lead to some kind of ‘discovery’ taking place on the basis of the machine’s abilities.<sup>[31]</sup> This brings forth the dilemma faced while thinking of how to protect such a ‘discovery’.

A crucial factor for any invention to be granted a patent is, whether or not it can pass the patentability criteria satisfactorily. This calls for it to possess novelty, an inventive step, and be capable of industrial application.<sup>[32]</sup> In the

case of inventions by AI enabled systems/technologies, the biggest challenge toward obtaining of a patent is satisfying this three steps test. For indicating novelty, it becomes necessary for the invention to be different from whatever exists in the prior art. Generally, this requires a thorough perusal of the existing prior art by the inventor to successfully determine at the invention stage itself, whether or not his invention can be easily anticipated, or is an outcome of further research and a creative mental component. While an AI system will certainly have access to prior art, due to its overseeing human scientists feeding in information, is it truly independent, let alone capable to make a judgment on whether or not its invention can account for something novel? As to the question of an inventive step, if novelty itself is difficult to determine by the AI system, chances of making innovations on existing models or concepts which is not obvious to a person skilled in the art, is certainly more difficult to achieve.<sup>[33]</sup> At present, AI is usually fed with pre-existing objectives which they are programmed to achieve. The technology must first advance to equip these systems with a human-like intelligence so that judgment calls on new situations can be made by them. Furthermore, on perusal of cases on patentability of computer programs, etc., it can be noticed that, the Court has denied patents to programs simply because what they perform is mechanical rather than inventive.<sup>[34]</sup> This is an important consideration, since AI is primarily running on computer programs devised to perform certain functions, subject to variations made by its human inventor.

However, with countries like India removing their rigid requirement of only computer programs in conjunction with a novel hardware being eligible for a patent,<sup>[35]</sup> if an AI enabled system created a software which can be used on generic machines, it would entail practical utility, perhaps in more than one industry, which allows satisfaction of the industrial application requirement within the patentability test. On a general note, current laws and guidelines need to be streamlined in a manner which may allow for inventions by AI to be granted patents. However, with several obstacles and confusions still existing over patentability and other aspects, deeper examination of the issues is required.

Invention, as seen, has many important elements, determining whether patent may be granted. However, there are certain requirements which are to be met when one is to be classified as an inventor. In the US, for instance, in the case of *Townsend v. Smith*,<sup>[36]</sup> it was held that, for something to be construed as a valid outcome of an invention, it must go through the stage of “conception”, i.e., a permanent idea must have been conceived in the mind of the inventor before the same be put into practice. If something is reduced not on account of a preconceived idea, then such a thing cannot be termed an invention and such person as a result is not an inventor.<sup>[37]</sup> With such ideas of conception, it has been argued that such forms of creative conception can occur in the human mind alone.<sup>[38]</sup> One of the most persuasive arguments for AI’s inclusion in the category of “inventor” is using the rationale behind the abolition of the “flash of genius” patentability test.<sup>[39]</sup> While this test honoured the conception requirement for recognizing something as an invention,<sup>[40]</sup> the US Congress negated this requirement and stated that, if an invention were something leading to the advancement of the science it wished to work upon, then the process of how it arose in the mind of the inventor, becomes irrelevant.<sup>[41]</sup> Naturally, since several AI programs such as AlphaGo, Watson, etc. perform functions such as generating solutions based on massive influx of data, it may be argued that these solutions contribute to the advancement of such science and hence must be granted patent status. However, the situation according to scholars is not as straightforward.

Even if the argument of collaborative invention was to be used, which would acknowledge computers as inventors, along with their human counterparts,<sup>[42]</sup> this does not stand because of the lack of “legal personality” accorded to computers in most legal systems, including Nigeria’s, akin to the position of corporations not being citizens. Another argument for allowing computers to be classified as inventors and afforded with patent protection is, the realization of the “incentive theory”. While computers which are incapable of emoting may not use this as motivation, it will continue to incentivize humans to produce such technologies as they understand the benefits emerging due to patent protection.<sup>[43]</sup> However, patents are largely provided to protect the inventor and honour his attachment to the invention, which he does not wish to be used at an exponential rate by others. Due to this, opponents of patents protection being granted to AIs, argue that computers lack any such attachment.<sup>[44]</sup> This makes them incapable of having strong opinions with regard to the manner of use of their invention, thereby defeating the very purpose behind a patent protection.

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## Trademark and AI

The edifice of trade mark registration exists primarily to provide useful information. Registers tell us who owns what. They signal the existence of exclusive property rights associated with commercial signs, thereby allowing other traders to plan around that information. These signals exist in ever increasing numbers. According to the World Intellectual Property Organisation (WIPO), an estimated 9.11 million new trade mark applications were filed worldwide in 2017, while in the same year there were an estimated 43.2 million active trade mark registrations at 138 offices worldwide.<sup>[45]</sup> Until recently, it was axiomatic that registers for marks were directed at human readers “an applicant for a trade mark, trade mark registry examiners, vigilant competitors, employees of search and watching agencies as well as the occasional judge. This list now has a new entrant.

The influence of artificial intelligence (AI) on trade mark registration is subtler than its impact on patent or copyright law. The creative and inventive domains of IP have to contend with seemingly existential challenges: whether increasingly autonomous computer software ought to be considered an inventor or author and whether the corresponding outputs should be recognised as protectable subject matter.<sup>[46]</sup> In the trade mark context, machine learning has developed to the point where AI algorithms can readily assess the similarity between marks as well as goods and services, flagging up potential conflicts. At first glance, this seems like an enhancement which merely allows users of registries to do what they already do, but better. The legal implications of an AI algorithm which “reads” a trade mark register, replicating or entirely replacing human judgment for certain stages of analysis, has not yet been

considered in any detail. Machine learning algorithms are involved in identifying potentially conflicting prior rights when selecting a mark, during clearance checks by private service providers or by trade mark registries themselves. The speed and comprehensiveness of coverage, as well as the increasingly routine application of AI, is potentially game-changing.

With image recognition technologies, recommendation systems in the online retail context hint at the broader implication for trade mark infringement.<sup>[47]</sup> A platform's virtual assistant or AI-powered recommendation system, like Amazon or Alibaba, might respond to a search query by suggesting an infringing product, based purely on statistical correlations relating to past searches on that platform. Alternatively, the system might treat the trade mark in a search query generically, as shorthand for a product class and offer the products of competitors within that class. Should the platform or online service provider be held liable if an autonomous AI system is making retail recommendations that infringe trade mark rights? Online grocery retailers or supermarkets already recommend substitutes if the desired product is not available and may offer a competing brand in the process. Is this helpful to consumers and competition enhancing, or damaging to trade mark owners' legitimate interests? Conversely, when virtual assistants shop on our behalf, does the "average consumer" hypothetical construct, characterised by imperfect recollection and the inability to make side by side comparisons, still apply to AI shoppers when assessing infringement?<sup>[48]</sup>

The ongoing transformation of retail services forms the backdrop for this set of questions. As an initial response, parallels might be drawn with keyword advertising case law, where AI algorithms have offered competing products in response to search terms consisting of trade marks. The answers to infringement questions may turn on how the results of the search are presented to consumers, as opposed to how the AI internally processes the trade mark. Where product recommendations are provided with suitable clarifications and qualifications, they should be permitted. Where they are misleading or ambiguous, they are likely to be infringing.<sup>[49]</sup>

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## Unfair Competition and AI

Technological attributes of technology industries set them apart from traditional industries. Firstly, technology markets are dynamically driven and through rapid innovation. The constant and rapid pace of technological change can act as an impediment for entities who try to exercise market power by domination. Market power of a firm in these markets may turn out to be ephemeral.<sup>[50]</sup> Secondly, Business models relying on vast collection and processing of big data in nearly real-time enable players in the digital space to offer a wide range of innovative and customised services.<sup>[51]</sup> However, the perks offered by technology come along with a potential threat of market domination by various entities through innovation itself, and there are no shortage of cases affirming that companies use AI to breach competition laws. AI is certainly an innovation which poses threats of market domination.

Evaluating on the horizontal level, the role of algorithms and artificial intelligence in collusion is an area that is increasingly being acknowledged in academic and policy forums. The academic literature suggests four possible scenarios of algorithm-induced collusion:

*Messenger*, where humans use computers and the IT environment to better execute cartels;

*Hub and Spoke*, where a single algorithm is used to determine price by numerous users;

*The Predictable Agent*, where pricing algorithms act as predictable agents and continually adjust to each other's prices and market, i.e. algorithm-enhanced conscious parallelism; and

*Digital eye*, where AI operating in enhanced market transparency leads to an anticompetitive outcome.

Keeping in mind the ever-evolving nature of AI, it will be very difficult to find ways to prevent collusion between self-learning algorithms. This might be one of the biggest challenges that competition law enforcers have ever faced.

The conversation of use of competition or antitrust laws to govern AI is still at an early stage. However, it is needless to emphasize the fact that Competition Law finds its relevance in the data sphere. The data driven mergers or acquisitions such as Yahoo-Verizon, Microsoft-LinkedIn and Facebook-WhatsApp have demanded pre-emptive attention from the Competition Law enforcement bodies and therefore it is difficult to ignore the potential role of competition law in the governance of data collection and processing practices. It is important to note that the impact of Big Data goes far beyond digital markets and the mergers of companies such as Bayer, Climate Corp and Monsanto shows that data driven business models can also lead to the convergence of companies from completely different sectors as well.

The commission of European communities in the *Google / DoubleClick case*<sup>[52]</sup> examined the potential threat to competition due to merger between Google and DoubleClick. Several complainants asserted that the merger would eliminate potential competition between Google and DoubleClick. While the various theories of harm brought forward by these complainants differ with regard to the details and nuances, they all rely on the presumption that DoubleClick has a number of advantages that would, absent the merger, allow it to develop into a key competitor of Google in the market for online ad intermediation and, by extension, in the market for the provision of bundled online ad intermediation and ad serving services.<sup>[53]</sup> Though the commission declared the merger to be valid, the case certainly opens up the competition and technology dichotomy. The concerns rose by big data and technology are innately related to AI because AI's decision-making process is dependent upon the data accumulated over the internet. AI has the potential to induce the algorithm-based collusion.

Also, through the exponential growth of the internet, online markets have now developed an ability to cover an



everâ€”increasing spectrum of commercial activities. The commercial bracket is not witnessing a creation of large online platforms which have the ability to wield substantial power over market participants. The online market platforms have access to the entire internet landscape including large volumes of personal data. Consequentially, they may assume a position where they are able to deter new innovation or tarnish consumer welfare.

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## IP and Virtual Environment / Reality

As VR becomes more widespread, new issues have begun to emerge in the field of Intellectual Property (IP) law. From trademark to patent disputes, this phenomenon has provided a new realm for legal questions to pop up. For example, in trademark law, VR issues are often occurring due to unauthorized use of trademarked services or goods. In particular, so far, there are still legal concerns regarding the virtual replication and insertion of brand names, logos, and trademarks in such unknown territory. In patent law, experts are facing a rise in the amount of litigation over patents that claim ownership of the underlying VR technology itself, making hard to define what is really claimed and, therefore, protected and infringed.

VR technology is evolving quickly: courts and trademark and patent offices are still behind in relating real world trademarks to their virtual world ones and in defining the differences between one VR technologyâ€™s novelty from another. This section gives an overview of some of the main cases that have already arisen and of the issues that may arise in this field.

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### Trademark issues

For a trademark to be worth protecting, the main requirements to be fulfilled are distinctiveness, lawfulness, truthfulness (non-deceptiveness), novelty and use in commerce. Although many of the same standards that protect trademarks in the real world apply to trademarks in virtual worlds, some grey areas do exist. A first kind of difficulty that the IP owner may face is whether the scope of its trademark covers only real goods or it can be extended to cover also intangible, virtual representations. In this regard, problems have emerged in the *Marvel v. NCSoft* case.<sup>[54]</sup> Marvel Enterprises sued NCSoft (the maker of the â€œCity of Heroesâ€ online role-playing game) for providing tools to its users to design superhero costumes for their avatars that allegedly infringed trademarks and copyrights of its well-known superheroes. The court dismissed Marvelâ€™s trademark claims, stating that the players did not use the brands in commerce and the use of Marvel superhero names by players within the game was not of an infringing nature.

A second kind of issue that the IP owner may face is related to the evidence of damages suffered from the use of its IP in a VR platform. If sales of the tangible, branded goods are not affected by the virtual goods, how can the IP owner prove damages? An example of technology that may cause problems in this regard is the Pok mon Go app. This game uses real pictures from the world to show the location of â€œPok stopsâ€ and â€œGymsâ€. For instance, Pok mon Go may use the logo of a company because the â€œPok stopâ€ or â€œGymâ€ is actually located at that company store. What if that store does not want to be associated with the Pok mon brand? Can it prevent the use of its logo and brand? The creator of Pok mon Go will likely argue that the game attracts customers to the store and therefore the game is actually beneficial to said company. Conclusively, no harm to the companyâ€™s brand would occur. While this may in fact be true, everything depends on the way the above mentioned company wants to be perceived by its clientele. Brand owners may start working with VR creators/developers to provide licenses for virtual goods that use their IP and allow players to virtually incorporate those trademarked products/services into their VR experiences.

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### Patent issues

Filing patents for VR is no different from any other technology. There are some differences, such as user interfaces and motion-tracking technologies, but the base elements needed for registration are the same: the invention must be new, involving an inventive step and suitable for industrial application. As a matter of fact, patents within the VR world go back to 1993, when a patent for a VR helmet was filed for the first time by Sega for the Sega Genesis Console. Virtual reality patents protect VR, an artificial simulation of the real world that has been designed by computer programs. One of the major trends recently captured by patents is the transformation from merely entertainment-based VR patents towards more useful, inclusive, and practical applications such as surgical simulators, telepresence surgery, complex medical database visualization, and rehabilitation data. Many companies have been filing patents to protect the technology behind such hardware developments. Nevertheless, it is worth remembering that: (i) patent registration may require a long time to be obtained (with the risk that in the meanwhile the technology implemented becomes obsolete); (ii) software ex se are not patentable; and (iii) that patent offices and courts are still not prepared to face the issues generated by these kind of devices.<sup>[55]</sup>

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## AI as Commons

The development of Artificial Intelligence (AI) has profound implications for improving human and computational productivity in the future. However, it also is an existential risk to human life because it could exceed human capabilities. As such, information about the technology, the direction of the development and its purpose is important. This can be achieved through openness and transparency of processes. Indeed, companies hold property rights over AI

and monopolies of software, data and experts. As a countermovement to leading AI companies, the “Open AI Movement” has evolved to push open-source AI research and products, to empower users, and to bridge the digital divide through participation and access. Many have argued that although the legal placement of AI is controversial, it should be seen as a basic human right.<sup>[56]</sup>

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## Liability and Vicarious Liability for IP Infringement

Who is the infringer? Even this simple question presents a complex scenario as far as artificial intelligence is concerned. For example, the Patents and Designs Act provides for both direct and indirect patent infringement. Of course, the statute does not provide guidance regarding how to resolve issues when AI is involved in patent infringement. Traditionally, the individual or corporation that manages or controls a machine will be liable in the event that AI infringes a patent. In many circumstances this rule functions well, however, two problems arise considering AI infringement:

the first is the question of who is liable if AI (without human intervention) infringes a patent and such infringement was not foreseeable when the AI was invented or programmed; and

the second relates to how to establish whether a patent has been infringed “this is especially problematic when AI processing occurs in a black box (AI decision-making process is not evident without significant analysis).

### Infringement without human intervention

The first problem arises in determining who is liable when AI infringes a patent in an unforeseeable way and without human intervention. If AI operates using its own neural network, it can generate novel ideas which are not foreseeable to the manager or controller of the machine.

If such an invention infringes the patent rights of third parties, the manager or controller of the AI machine could be held to be liable for actions which were not contemplated when the machine was invented and could not be controlled. This outcome is problematic because an underlying principle of our legal system is that people can predict when their actions break the law (or infringe somebody else’s rights). Where the manager or controller of the AI plays no role in the machine’s neural network and it operates autonomously, it is difficult to see how that individual can predict when they are likely to infringe another’s patent rights. As a matter of public policy, it is difficult to justify a successful patent infringement claim.

Attributing the actions of AI to humans associated with the machine, whether or not the human is involved in the decision-making of that AI machine, also gives rise to issues for other areas of law.Â It is likely that similar issues relating to liability will arise in other areas, such as personal injury law. For example, Tesla, Google, and many others use AI in the development of their self-driving cars, issues of liability will be considered in the event that a self-driving car is responsible for an accident causing the death or personal injury of an individual.

Ultimately, somebody will need to be responsible for loss caused by AI. The existing position may therefore continue to apply and the manager or controller of the AI may continue to be liable for patent infringement or personal injury. However, the need to harmonize the legal approach across other areas of law may give rise to challenges for judges faced with ordering large damage awards against individuals who were unable to control the actions of AI.

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### Proving infringement

The second problem is evidential and is most relevant to patents for processes<sup>[57]</sup> or products of patented processes.<sup>[58]</sup> if AI processing takes place within a black box, it may be difficult to establish that that AI infringes processes protected by patents. This problem has two limbs:

If AI decision-making and inventing cannot be interpreted, or it is difficult to interpret such processes, how can claimants prove that the AI has infringed their patent?

Can a claimant establish exactly where the infringement takes place?

First, claimants may have difficulty in proving that AI decision-making, which takes place within a black box, infringes a patent. Claimants may be unable to, without significant disclosure (or even at all), determine whether the AI infringes their patent. Given that disclosure can be an extremely costly process, and that courts may show an unwillingness to encourage large amounts of disclosure, this imposes a significant burden on claimants who may be required to commit significant time and funds to an action before being able to predict the prospects of success.

Second, if a claimant is unable to identify exactly what decision-making process is taking place in the black box, they will also face problems establishing exactly where an infringement takes place. If an AI’s neural network is spread across the cloud or on servers across multiple jurisdictions, it may be very difficult to establish the location that a patented process takes place. Given that patents are national rights and given that infringement is only committed in the jurisdiction in which that right applies, such a situation may lead to another string of decisions regarding the location of a process, as was considered in *William Hill v. Menashe*,<sup>[59]</sup> *Illumina v. Premaitha*,<sup>[60]</sup> and *RIM v Motorola*.<sup>[61]</sup>

Although there is no easy solution to the black box problem, claimants will need to be aware of the challenges of

bringing an infringement claim against AI. These challenges may increase the risk of litigation and are important factors in determining the viability of a claim. Conversely, developers of AI may become dissuaded from seeking patent protection for their AI processes in circumstances where infringement will be difficult or impossible to prove and may fall back on trade secrets or other forms of IP protection for their innovations.

Given the possible impact of AI on a variety of areas of law and the need to harmonize a legal approach to dealing with liability caused by independent AI, there is some uncertainty regarding the risk to managers or controllers of AI.

## Conclusion

There is no denying that AI is bound to develop increasingly by each passing day. With companies like GF, IBM, Apple, etc., advancing their attempts toward revolutionising technologies related to providing software solutions, sophisticated technologies based on AI are bound to increase the number of such “inventions” which may come about. There exists immense scope of legislators to develop guidelines in determining of such situations, providing it the most adequate form of legal safeguarding. However, the author shares the view of Stephen Hawking when he states that the autonomy of AI can diminish the worth of human thinking and invention. A more favourable solution would be to grant a more collaborative form of patent protection for the inventions made by an AI. This is because a human element is essential in managing the rights and obligations associated with patents, which cannot be done solely with a machine. Further, with increasing prospects of using thousands of AI enabled networks which function with or without human intervention, patent protection requires to be awarded on some anthropomorphic agent, who may be recognised in case such invention malfunctions, or carries a possible violation of law, therefore, attracting criminal liability. It must be remembered that in the quest of making IP laws adaptable to the changing technologies, one cannot choose to create an imbalance by diminishing the desired effects of criminal laws, which necessarily survive on human elements being involved. Additionally, we cannot completely submit to AI technologies, which would possibly reduce the role of the human race itself.

This article, thus, takes cognisance of the problematic current position of AI and recommends the following;

That there be a uniform recognition for AI; considering that despite AI being a reality around the world, it only carries recognition in a few countries like United States, England and New Zealand. So a positive step towards the recognition of AIs could be that, all member states of multilateral trading forums begin to recognise the same.

That there be a passage of an Artificial Intelligence Data Protect Act with the objective of governing AI and include remedies for both criminal and civil offences committed by an AI to its human actor. The Act could also set up a regulatory framework to govern and adjudicate the acts of AIs and look into violation, if any, committed by them.

As regards the lacunae that exists as to the criminal liability of AI actions; specific sanctions for an AI should be provided such as destruction of such an AI, or prohibition of the technology behind its creation from being used, if any criminal liability is to accrue to AI. This would be a major step to prevent innocent creators from being punished for actions of the AI which they have created and have no control over.

Lastly, while there is a clear demarcation between the inventor and the invention, with the advent of AI systems, it is essential that legislators address the question of inclusion of AI enabled systems under this category. With the increasing usage of these technologies and the widespread expanse of the solutions generated by the same, protection as an issue becomes an integral question. Questions of incentivising human scientists to create more of such systems alongside the danger of granting complete autonomy to these super intelligent systems is an area wherein the need for proper guidelines is most urgent.

## About the Author

**Chijioke Ukomadu** is a 500 level Law Student, Afe Babalola University, Ado-Ekiti, Ekiti State; Email: [\[emailÂ protected\]](#)

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