Chapter 8. Conclusion and Suggestions

8.1 Findings

8.1.1 Findings on International Provisions Regarding the Nature of Inventorship, Authorship and Ownership in Patent and Copyright

A perusal of the provisions in the international treaties and conventions indicates that:

a. Inventors are natural, biological persons capable of exercising commercial rights over their registered patents either by exploiting the inventions themselves or by licensing or assigning them under a contract. Inventors by rule are the first eligible applicants. If a non-inventor wants to submit a patent application, such application must indicate the basis of entitlement – e.g. succession certificate or contract of assignment evidencing the transfer of patent. The fact that only natural persons and not legal (juristic) persons cannot qualify as inventors can be further seen in Annexure B of the PCT Receiving Office Guidelines which states under Example 1 that: "*A legal entity cannot be an inventor. Therefore, where the applicant is a legal entity, the check-box "This person is also inventor" must not be marked*."

b. Authors of copyrightable works must possess nationality under Berne Convention and demonstrate capability of enjoying economic and moral rights over their creations. Economic rights typically entail commercial exploitation of the work through authorization of further use by third parties (e.g. translation, adaptation, public performance, recording, creation of cinematographic works etc.) for a fee. This presupposes that the author must be person capable of entering into a contract which authorizes further use by third parties. Likewise, personhood is also a vital requisite for ability to hold and exercise moral rights which flow directly from the author's personality.

8.1.2 Findings on AI as an Inventor and Owner in Patents

The discussion in Chapter 4 outlines that true inventor of a patentable invention (product or process) is, by rule, the first eligible applicant for the grant of a patent once the regulator is satisfied about compliance with the requirements of patentable subject matter. The inventor must conceive and execute the invention by reducing it to practice. Once, the inventor is granted the patent, all commercial rights to assign, license or mortgage the patent vest immediately in the inventor. The only scenario in which a non-inventor can apply for the patent is when such person is able to demonstrate in the application how that person has derived the rights from the original inventor. This transfer typically happens through succession or assignment. Unless the inventor is identified in the application and the applicant shows the basis for deriving the right to apply, the application will get rejected.

The following three questions must be answered systematically:

a. **Does the AI generated invention qualify as a patentable subject matter? –** For this, the concerned product or process must be novel, entail a non-obvious inventive step, and enjoy industrial application. A perusal of the international developments discussed in Chapter 2 shows that the problem of granting patent does not arise at this stage but the ones which follow thereafter as indicated below.

b. **Does AI qualify as an 'inventor'? -** For an AI to be recognized as the inventor, the it must be shown that AI possesses the capability to conceive and implement the necessary steps to effectuate the patentable product or process. But, for that AI must command sufficient personhood to conceive and reduce an invention to practice on its own without human assistance, and assign, license or mortgage those rights to an interested third party under a contract. The aspect of AI's personhood will be dealt under the findings of Chapter 7.

c. **Does AI qualify as the owner? –** Again, this question merits a discussion on personhood because only a person in law can be considered capable of enjoying economic rights through commercial exploitation of the patent. If we want to make AI a non-inventor owner who seeks to apply for the patent, it will have to show how it derived the right to apply from the original inventor. But, that will not be possible unless it acquires the personhood to be considered a party capable of entering into a contract and enjoy proprietary rights. Also, an examination of the theories of property would help us answer whether an AI can be motivated to invent a product or process to

   i. reap the fruits of its labour (**Labour Theory of Property)**, or

   ii. promote individual and collective gains simultaneously on a utilitarian basis **(Utilitarian Theory of Property)**, or

   iii. further the expression of its personality **(Personality Theory of Property)**

Item (i) can be further supplemented by the '**Rewards for Monopoly' theory** in patents which justify the existence of patents based on the fact that the grant of a patent is a just reward for the efforts of the inventor. Items (ii) and (iii) can be equally matched with the **'Monopoly-for-profit' theory** which states that the government ensures industrial progress by giving inventors a larger financial return as compared to what they would have anticipated without the government. This theory argues against excessive monopoly and advocates working patents in a manner which is conducive to the patent owner as well as its potential users through widespread disclosure and access.[385] Also relevant is the **'Exchange for Secrets' theory** that without incentivizing disclosure under a patent, the invention would remain a secret and be eventually

[385] See also Adam D Moore, *Intellectual Property, Innovation, and Social Progress: The Case Against Incentive Based Arguments* (2011) 26 Hamline Law Review 602, 629, "*...Microsoft holding 60-80% of the world market share for computer operating systems; they have patented their products and hold copyright protection over their code. This has a detrimental effect on social progress as anyone attempting to create a new product must obtain a licence from Microsoft*."

forgotten.[386]

Again, all these three items are premised on

i. ability to operate for of incentive by expecting benefits for efforts from the government.

ii. enjoyment of property rights as an extension of 'personality'

Both these attributes are vital elements of personhood conferred on natural and biological persons. It is thus imperative to finalize the findings on AI's patent eligibility only after we have conducted a thorough examination of the issue of personhood. The findings of Chapter 7 will address this issue.

d. **Does granting a patent to AI require a revision of 'person having ordinary skill in the art' to ascertain non obviousness of an invention?**

A patentable invention should not be obvious to a person ordinarily skilled in the field which relates to the invention in question. This notional person is not a super skilled robot but an average person with ordinary skill and creativity. However, if the high frequency of AI assisted or AI generated inventions compels the law makers to recognize AI as an eligible inventor, it would also necessitate a review of the notion of person ordinarily skilled in the art. A lot of inventions which were earlier patentable due to non-obviousness would then become non patentable due to the expected skill and efficiency of AI. In October, 2020, the US Patent and Trademark Office came out with a report titled 'Public Views on Artificial Intelligence and Intellectual Property Policy' where comments were solicited on this question.[387] Though the comments encompassed both types of responses favouring and going against revisiting the test of non-obviousness, the general agreement was that the developments had to be monitored closely in examination of AI patents. The approach would be a case-by-case one till enough number of applications have been scrutinized to come up with a uniform set of guidelines.

[386] Fritz Machlup, An Economic Review of The Patent System, 21 (1958)

[387] Sameer Gokhale, AI as a Tool for the "PHOSITA", https://www.lexology.com/library/detail.aspx?g=fd5ef6f0-5982-4d24-b4d2-0838453e2560

8.1.3 Findings on AI as an Author and Owner in Copyright

a. Test of Originality - Does the work satisfy the threshold of copyright protection?

The question ponders whether we can consider the AI generated work as an original intellectual creation by which a certain idea is expressed and affixed on a tangible medium.

Based on the current research, it is concluded that AI generated work can satisfy the threshold of originality because their output would easily become copyrightable by coming within the purview of 'modicum of creativity' exercised through labour, skill and judgement of the AI.

b. Test of Independence - Does the work originate from AI?

If the above question is answered in affirmative, the question here requires us to investigate the element of independence i.e. whether the creation can be directly traced to the AI or is it simply an assisting tool for its creator the final copyrightable output definitely originates from the AI. The creator simply feeds the training data into the AI programme, the algorithm for generating the output, and the input that is the problem or query that needs to be processed. While the creator dependence was more in earlier AI's functioning through machine learning principles, the current deep learning mechanism which uses more complex and nuanced programming principles has made AI more autonomous in terms of generating outputs without any material intervention from the programmer. However, this would purely be a question of fact. If a programmer or developer of the AI retains maximum control over the creation of output, AI cannot command authorship. A case in point would be the case of *Shenzhen Tencent v. Shanghai Yingxun*[388] where the Nanshan District People's Court attributed authorship to the creator of the AI 'Dreamwriter' rather than the AI itself. The selection and arrangement of ideas which forms the essence of an intellectual creation was traceable to the software developer and not the AI in question. It is therefore concluded that AI, at its current level of technology, would satisfy the

[388] Yue 0305 Min Chu No. 14010 (Guangzhou Shenzhen Nanshan People's Ct. Nov. 25, 2019) (China).

element of independence. But, the fact of authorship can be disputed if the element of developer's control dominates the operation of AI.[389]

c. Nature of Contribution – If the resulting work is protectable and independently created by AI, what is the nature of AI's contribution to the creation process?

Under this question, the research is trying to find out whether the AI is independently exercising a wide range of creative choices or is it simply performing a routine, mechanical function based on instructions from its creator. As observed by the ECJ in *Brompton Bicycle*[390], a copyrightable work must be a product of exercise of creative choices of the author and carry a reflection of his personality.

Based on the current research, it is concluded that while the labour, skill and judgement exercised by the AI cannot be disputed, a doubt remains whether the range of creative choices exercised by the AI could be considered as wide enough to fall within the ambit of copyrightability. With the increased sophistication of AI programmes, this kind of a creative exercise becomes more likely to happen even when the AI operates within the four corners of the algorithm created by its developer. The best example of such development in recent times would be the iOS application NaadSadhana. The application expertly tunes 40 strings based on specific ragas and also excels in contextual analysis of songs which may be a mixture of multiple ragas by composing the perfect accompanying music. While it was earlier felt that AI could not compose a score without human intervention, for example frequency of putting hooks in a composed song, the latest developments in AI suggest that more nuanced applications are in place to come up with creative scores without human assistance.[391]

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[389] See also ZHOU Bo, Artificial Intelligence and Copyright Protection - Judicial Practice in Chinese Courts, https://www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/conversation_ip_ai/pdf/ms_china_1_en.pdf

[390] Case C-833/18 (2020)

[391] See Divya Kala Bhavani, NaadSadhana app: from a simple tuner to a complex AI Indian Classical music creator, https://www.thehindu.com/entertainment/music/sandeep-ranade-apple-design-award-naadsadhana-ios-artificial-intelligence-indian-classical-music/article34796703.ece

d. Eligibility for Moral Rights - Since moral rights directly spring from authorship, can we consider AI as an entity capable of exercising moral rights under copyright law?

Moral rights are a manifestation of the personhood theory of property which sees ownership as a direct incident of the personality of the owner. The question on eligibility for moral rights therefore requires us to examine whether AI can be granted personhood under law. This particular finding has been recorded under Chapter 7.

e. Eligibility of AI for Copyright Ownership

Assuming that AI qualifies as an author, the next question that needs to be addressed is whether the AI is capable of exercising ownership over the protected work. Thus, the issue specifically at hand would be whether the AI capable of exercising economic rights and enforcement rights enjoyed by the owner of copyright in a protected work. This question would require an examination of whether under the theories of intellectual property rights, an AI can be accommodated as the owner of that copyright.

The theories of intellectual property rights provide the rationale for which a copyright in the protected work should be granted to its holder. Thus, if an AI is deemed eligible under any of these theories, it automatically qualifies for ownership. Professor William Fisher's classification in this regard may be consulted. Prof. Fisher has categorized as follows:

a. Fairness Theory - The fairness theory of copyright depends on the reason that the law should give creators what they have reaped. All the creators must be compensated and creators ought to hold control of their rewards for all the hard work.

b. Utilitarian Theory - Copyright supports Benthamite theory of greatest good of greatest number of people. It balances the interests of the people; the creator must be incentivized for its creation as it is the creation of the intellect of the

person but the society must be benefit at the same time. Balance demands protection of the monopoly right of the creator and the public to reap the true benefit of such invention. In the words of Lion Zemer,

"*…limited monopolies spur innovation, and in order to foster innovation the system must recognise exclusive rights in intellectual creations - rights which are limited in duration and scope and are balanced against rightholders' economic aspirations and power*."[392]

c. Labour Theory – The works of John Locke furnish us with two things

i. The property which was created by the labour of the person should be rewarded.

ii. Sufficient land must be left for others to own and use

In the event that an individual mixes their work on regularly held assets, they have the right to appreciate normal ownership over the consequences of their work.

As summed up by Gordon,

"*…the labourer who achieves property in what she takes from or makes from the common, has a claim right in it that all others have a prima facie duty to respect*."[393]

d. Personality Theory - Personality theory is not about rewarding the labour of the person but acknowledging the fact that work is a representation of a person's personality. Any creator when creates anything his work reflects his personality. Moral rights flow from personality theory to protect the integrity of the work of the author.

e. Social Planning Theory - Social planning theory depicts that the law ought to develop an equitable and cultured society by improving mankind instead of a restrictive

[392] Lior Zemer, *On the value of copyright theory* (2006) Intellectual Property Quarterly 55, 57.
[393] WendyJ Gordon, *A Property Right in Self-Expression: Equality and Individualism in the Natural Law of Intellectual Property* (1993) 102(7) The Yale LawJournal 1533, 1553.

approach centred around the creators of the protectable works. The interests of the creators are therefore subordinated to that of the society. [394]

f. **Tackling rampant 'web scraping' by generative AI –** If AI is considered the author of a generated work, by rule, it becomes the first owner of the work. The other scenario would be to consider the AI developer as the owner by creating a suitable exception in copyright laws. The legally recognized owner must not only command rights but also bear liabilities, for example, defending infringement suits which result from the unauthorized use of training data while the AI is being programmed. For instance, an AI may have looked at 10,000 copyrighted paintings to generate its own painting. This unauthorized act would attract proceedings for copyright infringement and the question would be posed whether AI possesses the requisite legal personality to bear the liability of infringement. If the owner is charged, it has to be determined whether such owner had 'caused' the infringement because the infringing act can only be directly traced to the AI. Recently, multiple copyright infringement suits of this nature have been filed in the US. For example, in *Anderson v. Stability AI, et al*.[395] the plaintiffs including the likes of Jeff Koons, Mc.Kernan, Andy Warhol and Ortiz alleged before the United States District Court of Northern California, San Francisco Division, that JPEG files generated by the defendants' Stable Diffusion and Mid Journey Product AI have been derived from the protected artwork of the plaintiffs. The other defendant DeviantArt.com has been violating the copyright of the various authors who have uploaded their paintings on the website in violation of their terms of service. The work of the defendants constitutes unauthorized derivations of their protected work ('conditioning data and the latent images'). The infringing work is a compilation of the plaintiffs' creations making the resultant output a reflection of the plaintiffs'

[394] William Fisher, Theories Of Intellectual Property, https://cyber.harvard.edu/people/tfisher/iptheory.pdf See also Neil Wilkof, *Theories of intellectual property: Is it worth the effort?* (2014) 9:4 J. Intell. Prop. L. & Pract. 257

[395] Case No. 3:23-cv-00201-WHO

work. Thus, infringement was alleged at three levels:

a. Copying of protected images into Stable Diffusion, the AI programme, to create the training data set by employing Large Artificial Intelligence Open Network ("LAION") through the method of 'diffusion'.

b. Distribution of Stable Diffusion to users of defendant websites.

c. Output images generated by Stable Diffusion ought to be treated as derivative works of the copyrighted images belonging to the plaintiffs.

But the claims were set aside by the Court on the ground that the plaintiffs failed to allege adequate facts or substantiate their claims with sufficient evidence. While granting leave to amend, the court noted that it was unclear how the five billion protected images could be compressed into Stable Diffusion. Stability, the AI developer, successfully established that Stable Diffusion used mathematical and statistical models to compress conceptual elements from the images. Thus, the plaintiffs failed to prove how incorporation of the concepts from the protected images and allowing access of the AI to the users amounted to unauthorized reproduction. The court also refuted the contention of the plaintiff that substantial similarity need not be proved in case of direct copying. As opposed to the ruling in *Range Rd. Music, Inc. v. E. Coast Foods, Inc*.[396] wholesale copying could not be established. The court drew support from *Litchfield v. Spielberg*[397] and *Authors Guild v. Google, Inc*.[398] where it was observed that a derivative infringing work must be substantially copied from the copyrighted work. The protection would extend only to the 'expressive content' of the work and not its general and unprotectable aspects.

A similar suit has also been filed against the defendant in *Getty Images (US), Inc. v. Stability AI,*

[396] 668 F.3d 1148 (9th Cir. 2012)
[397] 736 F.2d 1352, 1357 (9th Cir. 1984)
[398] 804 F.3d 202, 225 (2d Cir. 2015)

Inc.[399] before the Delaware District Court where Getty Images alleged that the defendant has indulged in unauthorized use of its copyrighted images which not only violate the copyright of Getty Images but also defeat the several license agreements executed by Getty Images with numerous technology innovators putting the defendants in an unfairly advantageous position.

In *J. Doe 1 v. GitHub, Inc.*[400], the California District Court refused to find infringement in a case where the plaintiffs alleged that the defendant used the copyright protected code to train its AI programmes Copilot and Codex. The plaintiffs had shared the code on GitHub under an open-source license where it could be used subject to the conditions that the user must attribute the use of the code in his or her work along with a copyright notice and the relevant license agreement. The Court could not find sufficient evidence to establish that the defendants had actually used the plaintiff's code, however, it granted the plaintiff's motion seeking an injunction on the use of the code by the defendant based on probable harm in the future. The plea for monetary compensation was declined as the Court did not consider the harm to be sufficiently 'concrete, imminent or substantial'.

The factual complexities of web scraping cases are perfectly illustrated by *Thomson Reuters Enterprise Centre GMBH v. Ross Intelligence Inc*. where the Delaware District Court declined summary judgement on the purpose and character of use, copyrightable character of the work, transformative nature of the allegedly infringing work and effect of relevant market. The court opined that except access of the defendant to the plaintiff’s database which could be determined as a matter of law, the above four elements of the fair use defence raised triable issues as to fact and would require a jury trial. At this stage, it remains unclear as to how much copyright protection the headnotes to the judgements uploaded on Westlaw would enjoy, how much of that work has been copied by the defendant, whether the defendant’s use of the headnotes differ

[399] Case No. 1:99-mc-09999 (D. Del. Jan 01, 2023)
[400] 4:22-cv-06823, (N.D. Cal.) (2023)

materially from the protected work and what could be the potential commercial consequences.[401]

Based on the current research, it is concluded that:

a. Fairness theory and Labour theory are both premised on the creator of the intellectual property acting out of incentive for a fair compensation and just returns on his effort respectively. An AI on the other hand operates solely out of the training data fed into its system, the algorithm created by its developer and the instructions given to solve a problem. So, the root of an AI's creation is not an economic motivation to create but to perform a routine task in a specified way when exposed to certain variable inputs. Hence, AI cannot command ownership rights under the fairness and labour theories. Likewise, since a financial incentive cannot motivate an AI to create, the utilitarian theory cannot apply. The question of balancing the creator's incentive with increased social welfare would only arise where the AI is personally motivated to create for economic reasons.

b. Social Planning Theory would not support copyright ownership of AI because the very essence of this theory is targeted at improving mankind and its culture. The focus always firmly rests on the collective interests of the community rather than the rights of the individual proprietor. Granting copyrights to AI could create unwarranted inequalities by giving more rights to those developers who possess stronger and more sophisticated forms of AI's. In such a scenario, if the diffusion of technology mandated under Article 8 of the TRIPS Agreement does not take place, it would disturb the balance between right holders and consumers in contravention of Article 7 of the Agreement.

[401] *Thomson Reuters Enterprise Centre GMBH v. Ross Intelligence Inc*., No. 1:20-cv-613-SB (September 25, 2023)

c. *Github* represents an opportunity lost for the legal fraternity to address whether unauthorized use of copyrighted material for training AI would amount to infringement. The fact that the court ruled out on actual harm through mere reference to evidence denied it the chance to comment on whether a comparison between the copyrighted work and the final work product of the AI could be undertaken to determine infringement. Usually, the similarity between the protected and infringing work is restricted to the end products and the not the process in which the infringing work is derived. While identifying infringement in such cases will be easier for copyrightable works of technical nature like computer programmes, the same cannot be said about making comparisons in case of literary or artistic works generated through web scraping by AI. The line of separation between the product and process in case of non-technical copyrightable works is blurry. Equally difficult it is to determine whether the output generated by AI reflects the incorporation of the protected work due to the subjectivity involved. These difficulties are also evident in the *Stability* ruling where the court dismissed the plaintiff's claims on account of insufficient evidence with a leave to amend. Laying down a definitive rule in this regard would allow courts to rule on web scarping by AI with greater clarity in future disputes.

8.1.4 Findings on Ethical Implications of Accommodating AI as an Inventor, Author and Owner in Patent and Copyright

The administrators may explore a wide gamut of regulatory measures that shape an AI governance regime after having considered the potential impact of these autonomous systems. Constructing the necessary governance structure needs a thorough analysis of whether any law can counter the challenges that come with the ever-expanding use of AI, or a new legislation/regulation is the need

of the hour. Resolving these issues is a complex challenge as a proper risk assessment muse precede any concrete legislative/regulatory steps.[402] In the words of Matthias,

"*...'autonomous artificial agents', are capable of fulfilling some, often quite narrow, purposes by moving autonomously through some 'space' and acting in it without human supervision...a 'responsibility gap' arises because, for machine agents of this kind, the human agent who programmed it no longer exerts direct control over the machine agent's behaviour...It would therefore be unjust to hold humans responsible for actions of machines over which they could not have sufficient control*."[403]

During the phase of AI development, impact assessments should assess how the programme is likely to execute its functions, ensure that it identifies problematic situations. This allows the developer to modify the programme structure at the very outset. Monitoring mechanisms can be utilized to halt the design and development of the programme if the core objectives are not being met. Impact assessments must also monitor the effects during deployment. The thrust of AI design and development should therefore be on testing, oversight and monitoring systems.[404]

New forms of technology invariably entail new risks. For instance, nuclear energy led to the development of weapons instead of solving the world's energy crisis and till date there is no sustainable way of disposing nuclear waste. Likewise, AI must be developed in a manner which does not lead to irreparable harm. A risky and uncontrollable technology must be handled with utmost care and any impact assessment regarding a technology like AI must be conducted through a scientific review which clearly outlines those situations where the technology cannot be used at all. In certain other situations where public interest may be impacted, the impact assessment may

[402] Dr. Axel Walz and Kay Firth-Butterfield, *Implementing Ethics into Artificial Intelligence: A Contribution, from a Legal Perspective, to the Development of an AI Governance Regime* 18 Duke L. & Tech. Rev. 176 (2019)

[403] Andreas Matthias, *The responsibility gap: Ascribing Responsibility for the Actions of Learning Automata* (2004) 6 Ethics and Information Technology 175-183

[404] Lorna McGregor et al., *International Human Rights Law as a Framework for Algorithmic Accountability* 68 INT'L & COMPAR. L.Q. 309, 330 (2019)

mandate additional regulatory approvals and compulsory use with a device which guarantees security. The conduct of impact analysis and subsequent implementation not only secures the rights of the community but further enhances general acceptance of novel forms of technology and leads to substantial economic welfare gains.[405]

The nature of AI as a form of technology allows it to transform social, economic and political landscapes rapidly. Since the framing of laws cannot be divorced from social realities, it is imperative that the legislature and makers of policy stay abreast by keeping pace with the evolution of AI. While an initiative such as the Hiroshima Process International Code of Conduct for Advanced AI Systems, October 30, 2023, under Principles 8 and 11[406] represent an encouraging step in the direction of bridging the policy gap to ensure that companies investing in AI commit to safeguarding intellectual property rights, a concern remains that such ethical codes are purely voluntary in nature and do not define the scope and extent of the liability clearly enough to deter infringing activities. Any such ethical implications must sufficiently inform legislative or regulatory measures to bring clarity in the chaos surrounding the patent and copyright protection in AI generated works. Any reformative process must therefore be more comprehensive and collective rather than developing isolated mechanisms with little effect on the current state of affairs.

8.1.5 Findings on Personhood

A perusal of the above three fundamental theories of personhood and property would suggest that the evolving jurisprudence of property over the last four centuries represents a constant tussle between the social and the individual, rights and duties. While utilitarianism and the theory of consent attempt at ascertaining the larger scheme of things by balancing individualistic property rights with that of the society or community for a more collective sense of welfare, the libertarians and the proponents of personality theory would prefer to retain their primary focus on the

[405] [405] Dr. Axel Walz and Kay Firth-Butterfield, *Implementing Ethics into Artificial Intelligence: A Contribution, from a Legal Perspective, to the Development of an AI Governance Regime* 18 Duke L. & Tech. Rev. 176, 199-200 (2019)

[406] https://digital-strategy.ec.europa.eu/en/library/hiroshima-process-international-code-conduct-advanced-ai-systems

individual with the society only qualifying for secondary consideration. While Bentham qualifies his test of utility with the quantum of pleasure and pain for every individual in the society, Locke holds self-preservation under natural law as sacrosanct and pervading over individual's proprietary and the state's administrative rights under any positive law. Hegel's personality theory undergoes a gradual dilution in Radin's classification of property.

Regardless of the eternal conflict with private rights and societal interests, it remains an undisputed fact that only an eligible 'person' under law can be treated as a right bearing unit. Since, ownership is an economic right vested in the author or the assignee of the author, AI must qualify as a person to exploit the protected work to its economic advantage. This could happen either in person or by transferring the rights under a contract to a third person. If the AI wants to enjoy the economic rights in its creation, law must recognize it as an entity capable of holding and exercising those rights. Even if the AI want to appropriate this right by assigning to a third person, it should have sufficient personhood under law to be competent enough to enter into a contract and transfer those rights. For both scenarios, legal personhood is a must.

The question naturally arises whether the machines would share certain essential traits of biological humans, demonstrate intentionality of actions, discriminate and exercise conscious and intelligent choices. It also becomes important to ponder upon the issue whether personhood can be denied to an entity for lacking moral agency and not being able to articulate its desires at par with human beings. Would the answer to the question of personhood be different if the earlier perceived unique traits like dignity become replicable through sophisticated programmes like artificial intelligence? In such a case, as Esposito argues, personhood would become a measurable quantity and would have to be determined based on features exhibited by an entity on a gradient scale. This approach exposes us to a possibility that certain autonomous 'things' could end up enjoying legal personhood

while a subject like a vegetative human being could miss out on it altogether.[407] However, though an expansive approach in recognising a large number of entities as legal persons would demystify the parameters on which rights and granted, it would also require a systematic ascertainment of liabilities which go hand in hand with the rights. For instance, if we recognise AI as a legitimate owner of patent, can the AI be sued for infringing a patent granted to a third party?[408]

John Rawls had noted that the ability of a person to plan and execute the main purpose of his life shows coherence in all the constituents of life. Rawls identified two key elements:

iii. **Self-worth** –core values and purpose of life.

iv. **Self-confidence** –self-belief to execute intentions.

Rawls also stressed on the individual's ability to remain a part of a *modus vivendi* community where a political structure is established based on consensus of members of the community characterized by a reciprocal understanding of mutual rights and duties.[409] According to Dworkin, a person under law should be capable of taking life changing decisions and cherish them without a sense of regret.[410] Hubbard has coined a **'Behavioural Test'** which may be explained as follows:

v. Interaction with environment;

vi. Sense of self and purpose;

vii. Creative life plan and execution of those plans; and

[407] Roberto Esposito, *The Dispositif of the Person* 8 L. CULT. & HUMAN. 17 (2012)
[408] Toni Selkala and Mikko Rajavuori, *Traditions, Myths, and Utopias of Personhood: An Introduction* 18 German L.J. 1017, 1041, 1055, 1064 (2017)
[409] John Rawls, A Theory of Justice 358, 386 (1999)
[410] Ronald Dworkin, *Politics, Death, and Nature* 6 Health Matrix 201, 206 (1996); Ronald Dworkin, *Euthanasia, Morality, and Law Transcript* 31 Loy. L.A. L. Rev. 1147, 1149 (1998).

viii. Ability to reside in a *modus vivendi* community, respect others' rights and bear responsibility for their violations.[411]

According to Friedrich Carl Von Savigny, 'innate freedom' defined personhood because without freedom legal capacity could not be developed.[412]

The current research indicates that AI as a form of technology is yet to demonstrate its ability to plan and execute a vision in line with a core objective in a manner similar to that of human beings. There also remains considerable doubt regarding an AI's ability to dwell in a community of members and mutually adjust its rights and obligations. Unlike human beings, AI does not understand what it is processing. The actions of AI are plain syntax. However, a human brain rises above syntax and analyses the semantics associated with syntax. E.g. AI may display the meaning of 'peace' but would not understand the semantics in a human way. An AI's existence and its actions till date are rigorously determined by the algorithm created by its operator, nullifying any legal capacity.[413]

According to Craig and Kerr, the current state of AI technology renders it incapable of authorship of copyrightable works. AI cannot appreciate and understand the true meaning and value of a concept at par with human cognition.[414] Diane Proudfoot cautions that the mere ability of the machines to exhibit express behaviour does not confer 'intentional agency' upon them. Unlike intentions portrayed though drives, interests and goals. Intention, as opposed to the functioning of AI is not computational. Thus, AI cannot think, communicate and express a copyrightable work in

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[411] F. Patrick Hubbard, *"DO ANDROIDS DREAM?": PERSONHOOD AND INTELLIGENT ARTIFACTS*, 83 Temp. L. Rev. 405 (2011)

[412] See generally C.B. Macpherson, The Political Theory of Possessive Individualism (1977)

[413] Gregory R. Wheeler and Luis Moniz Pereira, *Epistemology and artificial intelligence* [2004] 2 J. Appl. Log, 469-493; Charu C. Aggarwal, *Neural Networks and Deep Learning*, (Springer, 2018), 1-4; See also Christopher Buccafusco, A Theory of Copyright Authorship, 102 VA L. REV. 1229, 1261 (2016), "*…the act of stringing together words becomes an act of authorship not because of semantic intentions (those having to do with the intended meaning or interpretation of the work) but rather categorical intentions (about what kind of work the author has created.*"

[414] Carys Craig & Ian Kerr, *The Death of the AI Author*, 52 OTTAWA L. REV. 31 (2020), https://rdo-olr.org/2021/the-death-of-the-ai-author/, "*…the machine neither knows, understands, nor appreciates the connotation of its word assemblage, let alone the meaning or value of the 'work' as a whole*."

the same way as a natural person would conceive an idea and express it with full understanding.[415]

To quote Mizrahi,

"*While AI's ability to "learn" demonstrates some level of skill, the Al cannot choose to exercise free will and not follow its instructions*."[416]

While the instances discussed in this paper highlight a gradual shift towards stronger AI, it does not place the AI on the same pedestal as that of human brain or human consciousness which originates from the human neural network.[417]AI till date has not acquired the desired characteristics of a person in law. Therefore, it cannot be considered capable enough for enjoying ownership rights in a protected work.

Addressing the Central Argument

The research indicates the following conclusion on the listed elements of the central argument:

Tentative Supposition	**Conclusion**
AI must be considered as inventor under the patent laws in India, USA, UK and EU	**Partly affirmed (Note: AI can be only considered the 'nominal inventor' i.e. to the extent of being mentioned in the application.)**
AI must not be considered as an owner of a patent under the laws in India, USA, UK and EU. Ownership must vest in the creator of the AI.	**Affirmed.**

[415] Diane Proudfoot, *Anthropomorphism and AI: Turing's Much Misunderstood Imitation Game*, 175 ARTIFICIAL INTELLIGENCE 950, 951 (2011).

[416] SaritK. Mizrahi, *Jack of All Trades, Master of None: Is Copyright Protection Justified for Robotic Faux-Riginality?* WEROBOT 1, 2, 8 (Apr. 2019)

[417] Attila Karakus and Jan G. Michel, *Thinking about the real world*, (De Gruyter, 2013), 26-27.

AI must be considered as author under the copyright laws in India, USA, UK and EU.	**Partly affirmed (Note: AI can be only considered the 'nominal author' i.e. to the extent of being mentioned in the application.)**
AI must not be considered as an owner of a copyright under the laws in India, USA, UK and EU. Ownership must vest in the creator of the AI.	**Affirmed.**
Personhood of AI merits a relook at the jurisprudential view of a natural person in law.	**Rejected. (Note: Because a natural person in law under jurisprudence must be capable of bearing rights and duties. AI is yet to reach such a stage.)**

8.2 Suggestions

a. **AI Developer as Applicant in International Conventions and Treaties -** To incentivize research and development in the field of AI generated works, the developer of AI should be allowed to be the applicant for inventions and works independently created by AI without the need to prove succession or contractual transfer of rights. The general suggestion would be to make the changes to general authorship and ownership provisions under the TRIPS Agreement, Berne Convention, Paris Convention and the Patent Cooperation Treaty so that the national laws can be remodelled along those lines by the signatory states.

b. **Mention of AI as 'nominal inventor' in patent applications -** A separate provision should be added to the Paris Convention to allow AI to be recognised as 'nominal inventors' where the

inventions have been independently generated by AI. Nominal inventors may be identified in the application as required under Article 4ter of the Convention. However, an exemption should be created both under the Paris Convention and the Patent Cooperation Treaty to ensure that the AI developer applicant need not prove succession or contractual transfer of the invention.

c. **Mention of AI as 'nominal author' in copyright applications -** A separate provision should be added to the Berne Convention to allow AI to be recognised as 'nominal authors' where the works have been independently created by AI. The AI developer applicant must be allowed to file the registration application without requiring to prove eligibility flowing from succession or assignment. Nominal authors also would not require moral rights or personhood in the same way as authors in general. The language in Article 6bis of the Berne Convention should be modified accordingly.

d. **Detailed disclosure requirements for registrations sought on AI generated copyrightable works –** Copyright applications for AI generated works must comprehensively indicate the training data relied on by the AI and the manner in which this data was retrieved to tackle the issue of web scraping. The regulator must determine at the very outset whether the AI generated work is derivative in nature and amounts to infringement through unauthorized use of copyrighted works in the training data used by the AI. Any access to copyrighted works by the AI must be under proper license where the rights of the original authors are adequately protected.

e. **Ownership to AI Developer following grant -** Ownership rights in AI generated patentable inventions and copyrightable works should vest exclusively in the developer of AI. In the same way as 'authorship' of copyright in computer generated works in the UK under Section 9(3) of the Copyright, Designs and Patents Act, 1988, the basis of ownership would not be the programme which creates and transfers the work but rather the person who 'causes it to be

created'. The suggestion would be to amend the language in Articles 8-15 of the Berne Convention and Article 28 of the TRIPS Agreement to this effect. The amendment must clarify the basis of the ownership of AI i.e.

i. the owner who invests in the creation of AI, or

ii. the developer who programmes the AI, or

iii. the user of the AI who obtains a license from the owner and trains the AI

The need for this demarcation of 'ownership' has already been highlighted in a study conducted by the Institute for Information Law and the Joint Institute for Innovation Policy commissioned by the European Commission on November 25, 2020. The Commission approved this study in the IP Action Plan that was eventually submitted to the European Parliament and the Council.[418] The owner/developer/user of AI being a natural and biological person would easily satisfy the test of personhood and qualify as a right and duty bearing unit. The owner/developer/user would be motivated by the economic rights which accompany the grant of patent or copyright, enforce them before the regulators and courts, and would be equally amenable to duties and liabilities (e.g. disclosure requirements in registration applications, responding to infringement suits etc.) This would ensure that the investment, research and development in the AI remain continues to remain incentivized without compromising on the grant of patent and copyright to eligible inventions and works respectively.

f. **Implementation Guidelines framed on Periodic Basis at International Level -** Annual review by the TRIPS Council and WIPO should be conducted to review the technological status of AI for satisfying the requirements of inventorship/authorship and ownership in patent and copyright. The impact assessment must look at the following parameters:

i. Is the AI able to replicate human cognitive thinking independent of human input?

[418] See also João Pedro Quintais,Daniel Gervais, Bernt Hugenholtz, Trends And Developments In ArtificialIntelligence: Challenges To Patent Law, http://www.patentblog.kluweriplaw.com/2021/01/27/trends-and-developments-in-artificial-intelligence-challenges-to-patent-law/?print=print

ii. Does this improved thought process enable the AI to create the invention or work of authorship driven by economic incentive?

iii. Does this improved thought process drive the AI to protect its patent and copyright before the regulator and courts?

iv. Does this improved thought process render the AI capable of performing duties under law (e.g. satisfying registration formalities, responding to infringement suits etc.)?

v. If inventorship/authorship and ownership are both granted to an autonomous AI, could there be ethical implications that could endanger the long-term health, safety and well-being of the human race?