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The Interface between law and Artificial Intelligence: The Use of AI as a TOOL in Intellectual property law - Patent System

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ABSTRACT

This research sought to investigate the use of Artificial Intelligence in the development of patents, especially in the search and dissemination of anteriority. The research problem refers to the question of whether Artificial Intelligence technology can be considered as an Inventor in itself, and hold a patent: What are the main considerations and arguments for refusing this idea in the present scenario? Consequently, in order to achieve this multidisciplinary undertaking to study the interface between AI and Patents, it was necessary to apply a perspective also centered on data analysis, IOT and new technologies in the Age of the Digital Revolution, evaluating the algorithmic characteristic of Black Boxing. In addition, the studies necessarily covered the contextualization and criteria of legal responsibility, personality rights and contractual relations as fundamental factors to support the thesis discussed here. The studies briefly addressed the regulatory aspects and legislative policies of AI in the international and European contexts, providing a perspective of comparative law. Lastly, the work tried to address some of the issues of transparency and ethics involved in this problematic topic, bringing the concept of Cui Bono to justify the impossibility of granting a Patent to AI. Therefore, this research work encompassed the advantages and disadvantages involved in the Artificial Intelligence scenario, demonstrating improved performance and results of its use in the industrial property area, according to business practices and techniques, and the ethical parameters that must be pursued by society, to develop a transparent, reliable and "explicable" use of Artificial Intelligence, as a TOOL, especially related to the patent system.

Keywords: Patents; Artificial Intelligence; Liability;

1 Introduction

The present work aims to reflect about Artificial Intelligence within the scope of Patenting: regardless the fact that patent law is not yet uniform in the world, neither harmonized in Europe, the basic requirements to obtain/ to be granted a patent are conformed in the TRIPS (the agreement of Trade-Related Aspects of Intellectual Property Rights), as it is an international treaty established in the context of the WTO – World Trade Organization, and negotiated at the end of the Uruguay Round of the GATT – General Agreement on Tariffs and Trade (1st Chapter of the Havana Charter).

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TRIPS established the primary "standards" and requirements of novelty, industrial application, and Inventive Step[3], as well as this international "regulation"/framework set the excluded types of inventions; The comments that will be developed/launched further, in the next pages, will try to provide an indirect assessment of the *Inventive Step, and its "involvements" with the problematic of the possibility of an AI in "itself" be named-assigned as an Inventor in a patent filing (deposit), as the first basic "step" to obtain patent rights (SEKA, 1978),* and its primary impacts and consequences in the moral rights and interests that take place within the framework of being named as an Inventor.

In this regard, we just wanted to finally consider that the inherent character of "positioning" the name of the Inventor, in the patent application "records", results in conferring those moral rights to the individual agent as the patent's Inventor, which further demonstrates the "incompatibility" of granting the patent's rights "specifically" to the Artificial Intelligence involved (this "motivation assessment" will be investigated in the following pages, when we present the roman concept related to liability, *Cui bono*).[4]

Besides, being an inventor, as previously said, requires an "Individual person assessment" and carries moral interest that are not able to "function" or be present in a hypothetical AI inventor; since the Artificial Intelligences do not carry the multiple needed "characters and features" in order for them to be considered as an "individual", they are not considered moral "agents" within our society, and instead, the use of AI requires important Ethical binding standards to "force" the companies and individuals to further develop and create inventions in a rightful and responsible away, further enhancing innovation and benefiting the society in its entirety.

Moreover, due to the cross-border importance of the European Union-EU in the context of Patents as well as its kind of unique processes and proceedings to patent some invention, it is instructive to see what the European Commission has stating and saying about the Artificial Intelligence "revolution", in the meaning of its specific Coordinated Plan, from 2018: *"Like electricity in the past, artificial intelligence (AI) is*

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[3] "*A condition of patentability is that the invention involves an inventive step or be non-obvious. The standard applied for assessing non-obviousness is whether the invention would be obvious to a person skilled in the relevant art to which the invention belongs*." (WIPO Secretariat - Conversation on IP & AI. **Draft Issues Paper on Intellectual Property Policy and Artificial Intelligence**. 2019. *Available at: https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_ai_2_ge_20/wipo_ip_ai_2_ge_20_1.pdf . Last Access in 19. May. 2020.)*

[4] "*Inventorship on issued patents is presumed to be correct, and a challenger must prove its case by "clear and convincing evidence" and provide corroborating evidence…. If inventorship can be corrected, then the error will not render the patent invalid. A court may also order correction of inventorship, but an omitted inventor who moves for correction must meet a "heavy burden."* (LIM, Daryl. **AI & IP Innovation & Creativity in an Age of Accelerated Change**. 2018. *Akron Law Review, Pages 813 to 875. Available at: https://repository.jmls.edu/cgi/viewcontent.cgi?article=1724&context=facpubs . Last Access in 14. April. 2020. (John Marshal Law School - Institutional Repository)*

transforming our world. [...] Growth in computing power, availability of data, and progress in algorithms have turned AI into one of the most important technologies of the 21st century." (EC, 2018)

And it is further continued,

"Throughout history, the emergence of new technologies – from electricity to the internet – has changed the nature of work. ***It has brought major benefits to our society and economy, but also raised concerns.*** *The emergence of automation, robotics and AI is transforming the labor market,* ***and it is essential for the EU to manage this shift. […]*** *They can also help summarize large amounts of data, provide more accurate information, and suggest decisions, […] They ultimately help to enhance people's abilities. […]* ***New jobs and tasks will emerge as a result of AI";*** *(EC, 2018)*

2. DEVELOPMENT: Liability, "Disclosure" and Cui Bono in the Patenting System

We decided to present these two concepts here because of two major correlations that can be done: First, how to attribute a benefit to the considered AI-Inventor? How to assess this - the benefit - to evaluate who should be held liable in a fair and "impartial" situation? Second, how could we measure the potential/possible benefit related to grating a patent specifically to an AI?

In this sense, the Roman concept Cui Bono[5] *is a Latin phrase which means "who benefits?", and which is used to suggest that there is a high probability that those responsible for a certain event are the ones who stand to gain from it."*[6]

As we also consider that there is a high possibility of the existence of covered or disguised "human" interests in attributing the Inventorship of a patent to an AI - Artificial Intelligence; as we already discussed, the causality link is crucial to "confer" the responsibility of an agent concerning harm caused by an action or omission (negligence) of this very same agent in an assessment of "fairness": following this line of argumentation, we further believe that it is very risky to accept the hypothesis of holding the AI liable (besides the lack of legal personality & also the ethical concerns) because, as previously invoked, "exempting" the human agents behind the AI technology employed conform the possibility of leaving consumers unprotected, for example; furthermore, we also should imagine and raise the probability of considering the AI as an Inventor in an interplay with excluding and discharging these human agents of their due liability in face of consumers.

Lastly, as we already brought, Artificial Intelligence still requires nowadays human input of information - that will be further processed by the machine; independently of taking a statistical, or combinatorial, or algorithmic or analytical definition of AI, the requirement of inputted data is considered in

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[5] Cui Bono has as its synonym "*Cui prodest*": *Cui prodest is a Latin term which means "who profits?". It's used to raise a similar question as 'cui bono', and specifically to point out the fact that those who benefit from a certain event are likely to be responsible for it. (*Effectiviology.Com. **Cui Bono: why you should ask "who benefits"?** *Available at: https://effectiviology.com/cui-bono/ . Last Access in 08. June. 2020.)*

[6] Further, we felt useful to also historically frame this concept, which is attributed to roman Consul Lucius Cassius that repeatedly used the expression '*who had profited by it' ['cui bono fuisset'*] in his trials, in a conscious away of judging civil matters at that time. (Effectiviology.Com. **Cui Bono: why you should ask "who benefits"?** *Available at: https://effectiviology.com/cui-bono/ . Last Access in 08. June. 2020.)*

all of them; therefore, we further assess the "hidden dangers" (BATHAEE, 2018) in conferring Inventorship to the AI as it consequently generates a kind of exemption of responsibility of the agents involved in the development of the AI, such as programmers or digital designers.

In this regard for us, there is no distinct problem existent today since, considering AI as an advantageous tool to be used by "individual inventors, the liability will be "held" in the "figure" of the human inventor.

Ultimately, the direct assessment of *cui bono* allows to figure the motive behind some conduct - some action taken (or even an omission-negligence): *"One benefit of asking yourself 'cui bono?' is that doing so can encourage you to figure out how people benefit from the event in question, which could help you identify their motives."*[7]

Therefore, as we already argued, we cannot see how an AI can financial enjoy the economic monopoly provided by the patent's right of excluding people from exploring "its" patent; further, we do not even see the utility of conferring a financial monopoly of this type or nature; Also, we need to further assure here that we advocate the "pros" of employing Artificial Intelligence as a tool for truly boosting the prior art search within the patenting framework, benefiting from the higher processing speed of the AI methodologies and techniques;

Besides the need of observing the differences between the European and American patent systems, concerning the right to exclude, American Professor Adam Mossoff has done an extensive assessment of property, privileges, exclusive, and "exclusiveness" within the Patenting system.[8]

The right to exclude granted by a patent also raises ethical and legal concerns: the idea around conferring a monopoly to the patent holder was developed as a "balanced away" to further foster investment needed to create an invention - and we further compliment, by the Human inventor - since the requirement of "extensive" search of prior art, that is necessary to prove the effective inventive and novelty nature of the invention, involves the employment of distinct resources: human, financial, & time, for example;[9] In this sense, we

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[7] In this regard: "*Furthermore, asking 'cui bono?' can also help you identify people's ulterior motives in situations they conceal those motives, often by claiming to have an alternative motive, such as altruism. For example, when it comes to fighting pseudoscientific disinformation or unfounded conspiracy theories, asking 'cui bono?' can help highlight the fact that many of the individuals and groups who promote this kind of material benefit from it in a financial or social manner, which makes it more likely that their view is biased."* (Effectiviology.Com. **Cui Bono: why you should ask "who benefits"?** *Available at: https://effectiviology.com/cui-bono/ . Last Access in 08. June. 2020.)*

[8] For further comments about these features and differences, see: MOSSOFF, Adam. **Exclusion and Exclusive Use in Patent Law**. 2009. *Harvard Journal of law and Technology; Vol. 22; N. 2; Pages 321 to 379. Available at: http://jolt.law.harvard.edu/articles/pdf/v22/22HarvJLTech321.pdf . Last Access in 08. June. 2020.*

[9] "*Investment in AI patents represent faith in a cornerstone technology that could accelerate innovation, requiring less human skill and fewer resources over time." (*LIM, Daryl. **AI & IP Innovation & Creativity in an Age of Accelerated Change**. 2018. *Akron Law Review, Pages 813 to 875. Available at: https://repository.jmls.edu/cgi/viewcontent.cgi?article=1724&context=facpubs . Last Access in 14. April. 2020. (John Marshal Law School - Institutional Repository).*

reaffirm the utility in using and benefitting from Artificial Intelligence as a tool that will further prompt-boost the processing of data in evaluating the state-of-art in patenting, & finally allowing the possibility for human to create higher quality patentable inventions.

We further consider the employment of AI' tools can be a competitive advantage, demanding financial input conversely to higher & potentialized speed in data searching necessary to conform a patentable creation; also, as we already stated, moral rights are intrinsic of the naming of the Inventor, and can only be attributed and duly applied to agents with legal personality, therefore, it prescribes the inventor as necessarily an human individual.

Therefore, this shows the highly potential benefits of considering, and further taking AI as a Tool in extensive & "qualitative" prior-art search, to finally be able to determine the patent subject matter & the "Intangible value" of a patentable invention.

Furthermore, we felt relevant to briefly bring the distinct ethical assessment: *"AI can improve human decision-making, but it has its limits. The possibility exists that* ***bias*** *in algorithms can create an ethical risk that brings into question the reliability of the data produced by the system. Bias can be accounted for through explainability of the data, reproducibility in testing for consistent results and auditability." (MINTZ, 2020)*

Therefore, there is an explicit need of the supervision of the final results presented by the AI Machines, which amounts to the need of human contribution to the invention, in the meaning of the control of data that is inputted (since AI requires the "provision" of data sets to "apply" its goal-oriented characteristics/technique) and a specimen of "revision" & Monitoring of the sub-product that was "Invented".

Furthermore, nowadays we can realize the so-called higher neutrality of Artificial Intelligence methods is not entirely true,

"AI systems are programmed using a set of algorithms, and 'learn' by studying data to identify patterns. They are thus subject to both biases inherent in the algorithms employed - as different sets of engineers bring very differ - biases and assumptions to the creation of algorithms - and the data sets used. Different legal AI systems operate with different algorithms and, in many cases, on different datasets. Thus, despite claims of comprehensive and all-encompassing coverage, it is not surprising that different legal AI systems can produce different results." (YU; ALI, 2019)

Furthermore, nowadays we can realize the so-called higher neutrality of Artificial Intelligence methods is not entirely true; Therefore, in this regard, we shall notice that AI and Human are both biased and partial due to AI' need for data input; Impartiality & Neutrality in technology should be assessed taking into consideration moral and ethical standards, which lead us to the detection of the final "dependency" of AI concerning Human Control - the human agent will play a fundamental role in the creation of the invention, being, therefore, its legitimate inventor. Lastly, we will see in the following pages the real sense/meaning of "Technology-Neutral".

Concerning the terminology of "Ethical AI", Lohr & Gusher (2019) state "*To create an ethical enterprise and sustain it into the future, AI must be governed and controlled in a meaningful way. This is what we mean*

by ethical AI.'[10] And we still find the following "hint": "*Create 'contracts of trust.' Give customers the clarity and information that they want and need. […] The power to opt-in or opt-out*".

In this sense,

"To gain trust, which is necessary for societies to accept and use AI, the technology should be predictable, responsible, verifiable, respect fundamental rights and follow ethical rules. […] Crucially, humans should understand how AI makes decisions. […] Further developments in AI also require a regulatory framework that is flexible enough to promote innovation while ensuring high levels of protection and safety." (EC, 2018)

For us, we should take the necessity of the market in itself to adapt the consolidated patent system as it can be considered to have technical neutrality: this legal system was created in a way that it does accommodate/contain the different kinds of advanced and upgraded technology; Therefore, the requirement of Inventorship should remain the same: comprising human inventors that can choose to use/employ AI as a tool to further facilitate their process of creation of a patentable invention.

Consequently, the human inventor (a prior, as the primary owner of the patent - or it will be another agent throughout licensing of the patent' rights or definitive transfer of those exclusive rights) will remain responsible for bearing the damages of eventual harm caused to consumers that finally buy the products that "conform" the invention (since the marketing of those creations is a logical further step after the invention, as it is also related to the industrial applicability criteria assessment/test to the grating of a patent).

In this very same sense, the European Union already perceived the need to ensure that consumers are duly informed about Artificial Intelligence deployment in Products: *"Empowering individuals and consumers to make the most of AI. […] The large-scale use of AI-enabled tools in business-to-consumer transactions needs to be fair, transparent and compliant with consumer legislation. Consumers should receive clear information on the use, features and properties of AI-enabled products." (EC, 2020)*

We further believe that the "adjacent" regulatory framework (liability, safety rules, consumer' protection, etc.) - besides the patent system in itself, as it will be better explained in the conclusion of this work - should be flexible enough to allow a "smooth" adaptation of new "realities" without finally undermining or deprotecting people & consumers: this primarily includes the right of information/to be informed of consumers in relation to the employment of AI Tools in the respective products they buy, besides the general/regular information legal requisite for consumer's safeguard, in order to finally "build trust".

Therefore, as we already brought, the Black Boxing inherent of Artificial Intelligence results in a lack of transparency: accepting this would undermine the legal basis of liability, & consumers' protection - and the correlated consideration of the right to be informed and of informational asymmetry between consumers & vendors.[11] In the emphases of the asymmetry of data between the "developers" and the public consumers

[11] In this sense, "*On the contractual level, information asymmetry resulting from the use of AI may justify the application of a (statutory or case law) pre-contractual liability regime (culpa in contrahendo and similar concepts). It seems more likely, however, that the reaction of the legal system to potential irregularities in contracting with the use of algorithms will rely on contract law tools for assessing and challenging the validity of contracts (vitiated consent, lack of fairness,*

within the sphere of AI technologies, the need to a proper regulatory set of norms that could address these disparities, providing at the end, justice and the protection of democratic values, is essential. (YEUNG, 2019)

In this sense, Larsson & Heintz (2020) argue that "*Transparency, with its conceptual history, is often seen as a fundamental cornerstone of supervision and vital component of achieving accountability."*

In order to "construct"/assume a generally Legal AI (Mainly transparent, ethical, fair, trustworthy and safe, and even responsible) as a useful tool to be further employed in the Patenting System - and accounting AI' potentialities of improving the system as a tool -, human inventors have to take their respective position into controlling and monitoring AI.

Further, we bring the very recent complement of Ameet Joshi (2020):

"Any discussion about machine learning techniques cannot be complete without the understanding of performance measurement. Performance can be measured qualitatively by looking subjectively at a set of results or objectively at the value of an expression. ***Whenever size of data is large, subjective and qualitative tests can no longer give any reliable information about the general performance of the system and objective methods are the only way to go."*** *(JOSHI, 2020, pg. 67)*

In parallel to the control pursued by the humans – individual inventors and companies that further own patent rights, for example -, all these professionals should try to ensure the maximum level possible of disclosure of information, as it is a maximal pillar-reference in Modern Legal Systems.

Ultimately, in order to comply with the sufficient disclosure criteria specifically addressed and required to obtain a patent, in the context of Artificial Intelligence, we have to ensure "all possible ways" to cover and present the necessary amount (as well as weight and substance) of information that ended generating the invention; This is in line with the major public interest and "inventions availability" pursued by the Patenting System as a hole in the modern States.

In complement, as our study involved the interplay with the patenting System, "*When a patent expires, the public must be able to repurpose the registered technology. When the invention involves an algorithm that needs to be trained, a reference set must be provided in order to reach the level of the patented technology*." (BALLER, 2020)

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etc.)." (European Commission. **Liability for Artificial Intelligence: and other emerging digital technologies**. 2019. *Available at: https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=36608 . Last Access in 22. May. 2020.)*

We personally find two distinct flawless which render incorrect to confer Inventorship to an AI System: first, the inexistency of legal personality prevent Artificial Intelligence to directly contract; Secondly, due to the very own information asymmetry, even vitiated consent is difficult to address, & the lack of transparency due to the inherent Black Boxing of AI renders, in our opinion, the consideration of the Artificial Intelligence's Inventor as unfair and unjust ("not treating people in an equal away, or not morally right – Cambridge Dictionary), in the "thermological" line ;

Moreover, resuming, it is well known that patent law requires sufficient disclosure as it is "useful & necessary" to ascertain the inventive step of the patent by a "*skilled person in the field" – it should be replicated in disclosure. (BALLER, 2020)*

Therefore, we should further understand the inherent lack of transparency (Black Boxing) of AI prevents the proper assessment of the legal patenting requirements, as, besides the ethical issues involved, it hinders the evaluation of the inventive step – & even the industrial application requisite.[12] Finally, observing further the concept brought in this topic of *Cui Bono*, Artificial Intelligence cannot be considered as an Inventor, but only as an auxiliary tool to be deployed by the Human creator, in order to further protected the consumers of the "patented products" concerning the liability & damages assessment eventually suffered within the use of those products.

3 Conclusions & Comments – Final Remarks

Furthermore, the technological and algorithmic characteristics of the AI systems make these "methods" not fully understandable, or explainable nor transparent, which prevent the establishment of a proper Causality linkage to "apportionate" the eventual damages resulting/ arising from the use of those "inventions", and further giving raise to major concerns in relation to the ethics assessment of Artificial Intelligence employment in Patents; and ultimately, as different sources already noticed/brought recently (BURT, 2019; WEF, 2018), the systematics of Patent requirements cannot be considered as "matching" with AI lack of transparency, and the interplay between AI and IP/Patent are further in "collision"; this diverse information made us further research and "scrutinize" the regulatory aspects of each of those areas, in order to further conclude about the insufficiency of existing legal framework in addressing the ethical and legal issues of AI usage in patenting.

In this conclusion, we would like to point, and even raise, two other major concerns: regarding the brief assessment of the legal personality requirement – in order to theoretically concede a patent to an AI inventor; and taking into consideration the new and reported proposals of compulsory insurance for Artificial Intelligence systems especially within the context of the European Union institutions and policy makers.

Therefore, first, we thought about the consequences in the hypothetical situation: the grating of a patent right to an AI; and then, considering the current general lack of transparency within the employment of

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[12] *"In the case of black-box AI, the result of the AI's decision or conduct may not have been in any way foreseeable by the AI's creator or user. […] Put simply, if even the creator of the AI cannot foresee its effects, a reasonable person cannot either. Indeed, if the creator of AI cannot necessarily foresee how the AI will make decisions, what conduct it will engage in, or the nature of the patterns it will find in data, what can be said about the reasonable person in such a situation?."* (YU, Ronald; ALI, Gabriele Spina. **What is inside the Black Box? AI Challenges for lawyers and researchers.** 2019. Pages 2 to 13. *Available at: https://www.cambridge.org/core/services/aop-cambridge-core/content/view/8A547878999427F7222C3CEFC3CE5E01/S1472669619000021a.pdf/whats_inside_the_black_box_ai_challenges_for_lawyers_and_researchers.pdf . Last Access in 20. April. 2020.)*

Artificial intelligence[13], the invention provokes/causes/ brings harm to the human consumer; further envisaging the absence of an explicit or direct contractual agreement between the AI and the consumer (and this is not even possible because of the lack of personality, which further demonstrates the circularity regarding the AI' liability problem, making us reassure about the only alternative of the usage of AI as a toll in patenting), and here we could finally invoke the good faith principle in interpreting the terms of this implicit agreement within the framework of the "relationship" between the AI and human consumer: lastly, how to evaluate "good faith" in this type of situation, and even How could we attribute the good faith principle as a solution in dealing with Artificial Intelligence systems? - (we thought about this principle because, in our point of view, it is a very consolidate and useful in assisting the resolution of contractual disparities and claims).

Secondly, we could realize in our research that the provision of an obligatory insurance is not efficient in the present case, and for us, this idea was not very well reflected or prepared – it was very incipient, as it did not properly note the specificities of the present case (AI being considered as an inventor), since some professionals already provided us with a based opinion related to the inadequacy of compulsory insurance in a different range of events, especially in the context of the European Union & in relation to mandatory no-fault (negligence) liability insurance – since it further requires a better and proper understanding of the types of insurances and technologies, & even the risks, in order to match them up . (KUMAR & NAGLE, 2020; LEVY, 2020)

Moreover, we complement that the European Union need to encompass Artificial Intelligence, as this is the "natural" subsequent step all around the world since AI is already a present reality; however, European Institutions and the respective policy-makers shall observe the risks and impacts resulting from the broader use of AI by different kinds of businesses and companies, in order to properly and adequately regulate those Tools.

Further, in our opinion, we also state that avoiding and postponing the "issuance and release" of the correct and punctual AI Rules is dangerous, and even politically inadequate, especially related to the European Union legal frame and approach, as we follow Lappin & Dubhashi (2017) about a real harm that AI can bring into humans lives, and therefore, a true "partnership", human-centric AI needs to be developed and regulated (EC, 2019).

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[13] "*Although one possible way to alleviate the Black Box Problem is to regulate the minimum transparency required for AI, such regulation would be problematic for several reasons. 1. Transparency Is a Technological Problem.* […]" (World Economic Forum. **Artificial Intelligence collides with patent law – White Paper**. 2018. *Available at: http://www3.weforum.org/docs/WEF_48540_WP_End_of_Innovation_Protecting_Patent_Law.pdf . Last Access in 09. May. 2020.)*

Further, as we already brought, the different alleged solutions that conform as "possible" the consideration of AI as an Inventor, do not really solve the liability, transparency & ethical issues of the deployment of AI in the patent system; Also, we further recognize the problematics surrounding how would be assessed or measured the minimum standards for transparency of Artificial Intelligence.

Moreover, as some of the comments already addressed, it is further necessary to implement and enforce different ways of assuring responsibility in the employment of AI as tools; we also believe here that only pursuing an accountable, reliable and human-centric AI, as some scholars and professionals have already noticed and noted (CARRIÇO, 2018), the advantages of the use of these methodologies will "surpass" and "transcend" the inherent risks of those technologies; Ultimately, some of the mechanisms and enforceable "ways" of developing a Responsible AI can be further examined in the very recent book (DIGNUM, 2019).

In that meaning, we should recover that creating a trustful AI requires the protection of labor market within the EU, and further the update and upgrading of professionals - in all fields - in order build "capacity", qualifying and empowering people throughout proper digital training, for example: ultimately, accounting AI as methods that will be used by real employers in an efficient and secure manner.

Further, as we already said and explained the major contour of the present work in relation to the European legal framework, we also believe that neither the current existing regulatory scenario - the Product Liability Directive, The Motor insurance Directive of 2009, the Machinery Directive, the General product Safety European Directive, or even the recent data protection European regulation - , nor the so-called Asimov' Laws of Robotics are Sufficient (and we further think about being inefficient, as we would agree with ANDERSON (2017) about their need of updating, and even upgrading) in addressing the ethical and liability issues majorly arising from the inadvertent employment of AI in patents, disregarding the needed "duty of care" in dealing with those techniques; therefore, we reassure that AI Tools are very beneficial in the search of prior art and state-of-art, for example, that can be "complementary" applied into the development of patentable inventions by Human Inventors.

Besides the "historical construction" of Asimov, we also just state that Turing primordial test ascertain the existence of "intelligence" within a machine, for example, was relevant and pioneering at the time of the initial and primer investigations surrounding Robotics (ANYOHA, 2017), however, an actual critical assessment of the issue demonstrates the current impossibility of an AI as being considered intelligent as the human "Brain" (REGALADO, 2013 & LIM, 2018); moreover, even taking into account the "speediness" of the technological revolution and Machine learning, for example, we particularly notice that a better understanding of Artificial Intelligence features will still take some years, even decades to be done, since the lack of transparency and explainability were not surpassed (KREUTZER; SIRRENBERG, 2020).

And completing, the above authors have recently affirmed the uses of AI: production and smart manufacturing; customer service and sales; also in the service and maintenance sector; health care; transport and mobility; & financial services; As we can see, the benefits of employing AI in our daily lives are enormous, however, they will not serve their purpose of "technologies that help humans", if they do not receive the proper risk assessment, for example, and further, as we can observe, these fields are very much related to the economics in businesses; Therefore, we assert again the need of an adequate regulatory environment in order to provide the protection of humans and consumers.

Here, we reassure the crucial role of the patent offices in "apportioning" the private and public interests in "conceding" a patent to ensure the necessary unit within the Intellectual property and legal systems entirely; we further notice the position and appoint the function of the Patenting system in also granting secure patents,

throughout an objective criteria evaluation, and therefore, in our view, the EPO correctly rejected the first patents "invented" by Artificial intelligence systems.

In the view of the main liability/responsibility perspective granted/giving in this article, we further reassure that *"In the event of any harmful effects, responsibly managed systems should be equipped with mechanisms that allow for reparative measures. […] Context that demands lawmakers create policies for algorithmic accountability to ensure these powerful tools serve the public good." (LARSSON, 2019)*

Ultimately, in this field, we just corroborate the idea brought by Dvorsky (2014), as we also comment in this conclusion that AI character is specially not transparent, which raises very specific legal worries in relation to the deployment of Artificial Intelligence in a such strategic area as Patenting, and further in relation to intellectual property law.

We will again remember that Artificial Intelligence systems cannot be considered as having inventive capacities or performing the required inventive step in Patenting, regarding the two major facts of sentience and singularity, as AI machines are not conscious neither can be considered or taken as omniscients[14], or even as single and individual agents, in the "human," tangible and philosophical senses, and further, it is not appropriate to concede personality to AI.

We shall notice that the main arguments provided in this paper are complementary to each order (they do not "exclude" themselves), & further, they demonstrate the circularity within this situation that corroborates with our idea about the impossibility of the AI as being considered as an Inventor.

Therefore, in this meaning, we believe "Ethics" and the moral factors are fundamental considerations related to deployment of Artificial Intelligence tools, consisting in true "barriers" (SHARKEY, 2009) that need to further guide the regulatory policy of the "open use" of this *specimen* of technologies, as we shall consider the potential results of AI in innovation, transparency, competitiveness, and in private and public economic strategies; and further in the Intellectual property System in its entirety.

We believe the patent requirements cannot be set aside nor disregarded in considering the AI use as tools in human inventions, and therefore, inventorship as known nowadays cannot be attributed to an Artificial Intelligence method, since we lastly consider that the patent system was and is historically constructed, in the meaning of being build up throughout "funded" basis and "reflections" over the latter couple centuries; invoking a potential needed upgrade "overnight", in our opinion, will undermine the very own purpose of Intellectual property in fostering investment and innovation, within the encompassed benefits for society as a whole and further affording the essential postulate of legal certainty. (PAUNIO, 2009)

As it is relevant to bring in this conclusion the theme that embraces the interface between governance & Data,

"The creation of common European data spaces in a number of areas such as manufacturing or energy will constitute a major asset for European innovators and businesses. […] across Europe and make them available to train AI on a

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[14] *"Omniscience is the property of having complete or maximal knowledge*." (Standford Encyclopedia of Philosophy. **Omniscience.** 2017/2010. *Available at: https://plato.stanford.edu/entries/omniscience/#OmniCard . Last Access in 08. June. 2020.)*

scale that will enable the development of new products and services. Rapid development and adoption of European rules such as interoperability requirements and standards is essential." (EC, 2018)

We shall draw of this excerpt the importance of "robotics & AI standardization" within the framework of the EU (European Union), and further the "internationalization" of the distinct and correlated guidelines in order to provide an ethical and upgraded AI' use, perceiving finally the interconnection & "operability" between AI' public policies around the world; Secondly, we personally believe that a "Data regulatory framework" should also be developed accounting & focusing on the Patent System. Due to its relevance to investment and Innovation; Ultimately, we shall recall the true "Data requirement" of Artificial Intelligence (input), which consequently demand later supervision of the final results by the Human-agent/actor, conforming the outcome: the Human Inventor provides relevant "Contribution" to the patentable creation, & He should be consider the final creator & primary owner of the Patent – any harm provoked by the marketing of the patent/invention will be further assessed in related to this individual, respecting and observing the causality link in order to determine the existence & amount of damages due.

In order to provide a proper assessment of AI-Artificial Intelligence, considering its heuristics & constant updating, for example, we shall further comprehend that efforts should be taken at the international level:

"The problem of AI cannot be limited by territoriality and its highlighting of different legal traditions practices. […] This problematic extends beyond national borders, which mean that it is not a problem of individual country or continent. This is a worldwide significance problem. For this reason, we need not only the regional unification act of AI law, but the global one as well." (CERKA; GRIGIENE; SIRBIKYTE, 2017)

Further, concerning the needed ethical evaluation & "measurement" of Artificial Intelligence, since it involves the setting of recommendation and guidelines, for example, which play a major role in internationalization and standardization, *"Scientists and engineers working in robotics must be mindful of the potential dangers of their work, and public and international discussion is vital in order to set policy guidelines for ethical and safe application before the guidelines set themselves". (BALLER, 2020)*

Furthermore, regarding the history of Artificial Intelligence, *"The invention of the first calculating machines and the development of the first universal computers were driven by the idea to liberate people from certain every-day tasks. At that time, one really thought of help in computations only and by no means of helping hands in private homes."(FINK, 2014)*

Accounting the AI's "*Roller Coaster of Success and Setbacks*":

"From 1957 to 1974, AI flourished. Computers could store more information and became faster, cheaper, and more accessible. Machine learning algorithms also improved, and people got better at knowing which algorithm to apply to their problem. …However, while the basic proof of principle was there, there was still a long way to go before the end goals of natural language processing, abstract thinking, and self-recognition could be achieved." (ANYOHA, 2017)

As we can see, Artificial Intelligence's intrinsic dependency on inputted Data is the primer argument – in our opinion - to consider it as an "Auxiliary Tool" to the human Inventor in creating a Patentable Invention, in respect to the attention of technology neutrality; further, in the sense explained above, we shall further envisage the "big picture surrounding" the current argument in favor of granting AI Inventorship of a Patent,

since Artificial Intelligence already exists for a couple of decades (we could even consider a century), so as the Patenting system as we know it nowadays. Therefore, accounting for the concept of *cui bono* already discussed in the previous topic, we shall question ourselves why this "buzz" and "Mediatization" now around this very own subject matter.

Moreover, regarding Artificial Intelligence, we conclude the possibility of assuming the auxiliary benefit of AI as a Tool for the outcome of an invention, finally considering the Human-agent behind the employment of "AIT" (Artificial Intelligence Tools) as the Inventor, & the respective premise of moral and "exclusive property" rights, and liability duties & obligations – in the case of the Inventor being the patent's owner that markets a product exploiting and applying the respective creation.

The advantages of the use of AI comprise differently the languages assessment issue in the patenting system, further reiterating & contributing to the idea of AI as an auxiliary tool to be used by the Human Inventor;

Finally, we further agree with Lohr & Gusher (2019) when they state about the AI potentialities of further increasing HUMAN creative/innovative ENDEAVOURS (LIM, 2018): *"We need to shift from a culture of automation to augmentation. By making AI more explainable, auditable, and transparent, we can make our systems fairer, more effective and more useful."*

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