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BREVES AVALIAÇÕES SOBRE PERSONALIDADE E RESPONSABILIDADE JURÍDICAS

uma discussão sobre tecnologias de inteligência artificial em patentes

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Resumo

A pesquisa pautou-se numa abordagem interdisciplinar sobre a ética jurídica envolvida na Era Digital, especialmente no que diz respeito ao uso de Inteligência Artificial no desenvolvimento de patentes como contorno; Além disso, os estudos abrangeram uma visão sobre a questão da responsabilidade civil, no âmbito amplo do Direito Contratual e das licenças. A pesquisa abordou as diferentes teorias e perspectivas sobre capacidade jurídica, direito privado e direitos da personalidade, ilustrando o conceito teórico de justiça para fundamentar/embasar a problemática ética decorrente do uso da IA. Portanto, este trabalho de pesquisa englobou as vantagens e desvantagens envolvidas no cenário da Inteligência Artificial, demonstrando o desempenho e os resultados aprimorados na área de propriedade industrial, de acordo com práticas e técnicas empresariais e parâmetros éticos que devem ser perseguidos pela sociedade, para desenvolver um uso transparente, confiável, e explicável da Inteligência Artificial como uma ferramenta especialmente relacionada ao sistema de patentes. Além disso, os estudos abordaram sumariamente os aspectos regulatórios e as políticas legislativas da IA nos contextos internacional e europeu, fornecendo um quadro de direito comparado. Consequentemente, para alcançar este esforço multidisciplinar, uma perspectiva também centrada na análise de dados teve que ser aplicada, empregando principalmente o método e os esquemas funcionais, visando melhor abordar o uso da IA na propriedade intelectual e suas consequências. Foi apresentada uma pequena introdução aos conceitos relevantes do cenário de IA, assim como os leitores encontrarão a contextualização de alguns outros conceitos ao longo desta tese; mais tarde, foi introduzida – e necessariamente criticada – a ideia de um esquema de seguro obrigatório para essas tecnologias de inteligência artificial; Ainda, o trabalho abordou algumas das questões éticas, de transparência e jurídicas envolvidas nessa problemática, e para isso, foram aqui abarcados alguns comentários sobre o marco contratual e as mudanças trabalhistas, a fim de chegar à principal conclusão do uso da IA como ferramenta para auxiliar na "entrega" de inovações, "invenções" e melhorias do sistema de Patentes na totalidade; Com relação às limitações do presente trabalho, visto que o tema vem sendo bastante discutido entre áreas afins, o objetivo foi abordar os principais pontos jurídicos da responsabilidade civil e dos problemas éticos, a partir das suas noções básicas, portanto, outras ideias poderiam ser elaboradas e esculpidas.

Palavras-chave: patentes; inteligência artificial; responsabilidade; ética.

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BRIEF ASSESSMENTS ON LEGAL PERSONALITY AND LIABILITY

a discussion between artificial intelligence technologies in patents

Abstract

Briefly, the research was based in an interdisciplinary approach about the legal ethics involved in the Digital Era, especially concerning the use of Artificial Intelligence in patents' development and rights as a contour; Moreover, the studies encompassed a view on the liability issue, within the broad framework of Contractual Law and licensing. Further, the research addressed the different theories and perspectives on legal capacity, private law, and personality rights, illustrating the theoretical justice concept to substantiate/underlie the ethical problematics arising from the use of AI. Therefore, this research work encompassed the advantages and disadvantages involved in the Artificial Intelligence scenario, demonstrating the enhanced performance and outcomes in the industrial property area, accordingly to business practices and techniques, and ethical parameters that should be pursued by the society, to develop a transparent, reliable, trustworthy and explainable use of Artificial Intelligence as a tool especially related to the patent system. Besides, the studies summarily approached the regulatory aspects and legislative policies of AI in the International and European contexts, providing a comparative law picture. Consequently, to achieve this multidisciplinary endeavor, a perspective also centered on data analysis had to be applied, employing mainly the functional method and schemes, with the purpose of better addressing the use of AI in intellectual property and its consequences. Furthermore, it was presented a small introduction to the relevant concepts of the scenario of AI, as well as the readers will find the contextualization of some other concepts throughout this work; later on, it was introduced – and necessarily criticized—the idea of an obligatory insurance scheme for these artificial intelligence technologies to be "pursued" by the AI developers and companies; Further, the work tried to approach some ethical, transparency and legal issues involved in this problematic subject, and to achieve this, some comments about the contractual framework and labor changes were encompassed here, in order to reach the main conclusion of the use of AI as a tool to help the " delivery" of innovations and improvement of the Patent system as a whole; Regarding the limitations of the present work, since the theme is being very discussed amongst all the related areas, the goal was to address the key and top legal points of civil liability and ethical problems, with their basics notions; therefore, a lot of further ideas could be elaborated and carved.

Keywords: patentes; artificial intelligence; civil liability; ethics.

1 INTRODUCTION

This written work tried to present and explain the following questions and objectives: Artificial Intelligence technology can be considered as an Inventor? Second – therefore, an AI could hold a patent? Why? What are the main considerations and arguments to refuse this idea in the present?

All of these problems amount to the addressing of the ethical and civil liability problematics that justify the ideology of the advantages of the AI as an improvement TOOL in the sphere of patent law, reporting the speed of data processing and "accuracy" that the employment of these "methods" provides to Inventors.

For this endeavor, it was found substantial to follow the "exact" opinion provided by Ameet Joshi, in his introduction about AI and machine learning in his very recent book of this year, 2020:

> The roots of these words originate from multiple disciplines and not just computer science. These disciplines include pure mathematics, electrical engineering, statistics, signal processing, and communications along with computer science to name the top few. I cannot imagine any other area that emerges as a conflation of such a wide variety of disciplines. Along with the wide variety of origins, the field also finds applications in an even greater number of industries;" (JOSHI, 2020, pg 3)

As it can be seen, the plurality of areas encompassed by the theme of Artificial Intelligence, and its continuous updates and upgrades that will be briefly approached, made it very difficult to shape the present Master's final work, as well as it already gives the readers the idea of the scientific, conceptual and methodological limitations that could be found in its development.

The "contour" of this work was provoked by the following news: *"A University of Surrey-based team has filed the first patent applications for inventions created by a machine. Applications were made to the US, EU, and UK patent offices; they are for a machine using artificial intelligence as the inventor of two ideas for a beverage container and a flashing light"(COHEN, 2019).*

It provides us with the notion of how technologies are exponentially evolving, entering and influencing, in a unique away*, the public sphere, and requiring the attention of the Law, public policies and different kind of regulatory guidelines (BARFIELD, 2015)* to mitigate all the potential negative effects of an "unrestrained", irresponsible and "unmonitored" use of AI and Machine Learning by individuals in the contemporary society.

In this field, it is relevant to bring what the *Council of Bars and Law Societies of Europe* stressed about the issue of the importance of a correct legal assessment of technology use, in

order to provide legal certainty and finally, safeguard the parameters and ethical standards of justice in the context/framework of the Law, "*As lawyers play an important role to ensure access to justice, defense of the rule of law and protection of democratic values, they seem to have a particular role to play when it comes to the further development and deployment of AI tools, especially in those areas where access to justice and due process are at stake"(CCBE, 2020)*.

We should interpret the area of patent law as being "at stake", for a couple of different reasons: the strategic role of the patent system to innovation (HIGGINS, 2019); also, it is a fundamental goal of this work to make legal students and professional think about how the legal system as a whole will deal with the liability and compensation problems raised from defects or errors on products that employ this theoretical AI developed patent – if we assume and accept this ideology -, bearing in mind the post-modern need of protecting consumers in B2C (Business-to-Consumer) businesses, especially within the concept of *acquis communautaire*[3] of the EU – European Union (MILLER, 2011). In this regard, it is special to look at what the Commission brought in one of its last reports, in 2019, about civil liability related to Artificial Intelligence in the context of the Union:

> For most technological ecosystems (by which we mean systems with interacting devices or programs), however, no specific liability regimes exist. This means that product liability, general tort law rules (fault-based liability, tort or negligence, breach of statutory duty), and possibly contractual liability, occupy center stage. The more complex these ecosystems become with emerging digital technologies, the more increasingly difficult it becomes to apply liability frameworks." (EC, 2019)

Therefore, the "digitalized" ecosystem surely poses additional problems to be dealt with by the Law within its role of organizing the society, taking into consideration the specific, and historically constructed, ethical "guidelines and standards"; and since we are talking about the diversity currently found into the technological methodologies and tools, we consider that it is almost obvious the impact of AI and machine learning in Intellectual property, what was very recently endorsed by WIPO (World Intellectual Property Organization),

> Artificial intelligence (AI) has emerged as a general-purpose technology with widespread applications throughout the economy and society. It is already having, and

[3] It is an essential reference to European-Community Law, in its sense of "primacy" in relation to local & State's law, which follows the principle of subsidiary; Therefore, the "acquis" involves political objectives and principles of the European Union, in its entirety; (EUABC.com. *Acquis Communautaire*. *Available at: http://en.euabc.com/word/12 . Last Access in 07. June. 2020.)* Finally, this comprises relevant & "more flexible Soft law" as declarations, recommendations, opinions & guidelines to promote "legal uniformity" within a so-called transnational legal space (ZERILLI, Filippo. *The rule of soft law: an introduction*. *Available at:< https://www.peacepalacelibrary.nl/ebooks/files/The%20rule%20of%20soft%20law%20An%20introduction%20 Zerilli.pdf> . Last Access in 06. June. 2020.)*

> is likely to have increasingly in the future, a significant *impact on the creation, production, and distribution of economic and cultural goods and services. As such, AI intersects with intellectual property (IP) policy at a number of different points, since one of the main aims of IP policy is to stimulate innovation and creativity in the economic and cultural systems."* (WIPO, 2019)

Taking into account/envisaging the need to correctly address the employment of AI in patenting, in the scope of the law, we finally thought about the relevance of providing a dual study of the "conditions" of liability and Ethics in Artificial Intelligence, and this is directly the major justification to this written work.

2 THE EUROPEAN PATENT OFFICE - EPO

We can consider that The EPO already publicly developed its own opinions regarding the current impossibility of an AI to be explicitly and specifically taken as an Inventor in a Patent filling, as it (the European Office) provided us with a detailed analysis of the patentability requirements, demonstrating the "incongruence" of this idea, as well as its "inutility" in the meaning of thinking that an Artificial Intelligence "technique" could be registered as the Inventor of a patent; and that would further consist in an inefficient approach, bringing "distortion" to the innovative system as a whole;

> In a nutshell, the EPO has indicated that the approach it has developed for computer-implemented inventions also applies to AI. In effect, this means that an AI-enabled invention can be patentable provided that the claimed technical features are inventive (eg, any claimed non-technical features are not considered for inventive step). Any claimed AI-related features as such are not considered technical (being mathematical in nature) and are considered only to contribute to an inventive step if they support a technical effect or purpose. This approach immediately closes the door on the patentability of fundamental AI algorithms (eg, an AI algorithm that is not directly coupled to a specific application)." (EPO, 2018)

Further, the Office specifically define the legal scope of mathematic methods[4], providing one of the major reasons why the AI cannot be an Inventor as such, and in instead of this, it can conform itself in a very useful tool, helping inventors in prior art search and "defining" the state of the art in a more rapid and effective away.

And the EPO further continues to address this specific issue, taking into account the aspect of "exemptions" – concerning the patentability "criteria";

[4] *"[…] The mathematical method does not serve a technical purpose and the claimed technical implementation does not go beyond a generic technical implementation; the mathematical method does not contribute to the technical character of the invention. In such a case, it is not sufficient that the mathematical method is algorithmically more efficient than prior-art mathematical methods (see G-II, 3.6)*" (EPO - European Patent Office. *Guidelines for examination - artificial intelligence and Machine Learning. Available at: https://www.epo.org/law-practice/legal-texts/html/ guidelines2018/e/g_ii_3_3_1.htm . Last Access in 05. April. 2020.)*

> Merely specifying the technical nature of the data or parameters of the mathematical method may not be sufficient to define an invention in the sense of Art. 52(1), as the resulting method may still fall under the excluded category of methods for performing mental acts as such (Art. 52(2)(c) and (3), see G-II, 3.5.1). […] Once it is established that the claimed subject-matter as a whole is not excluded from patentability under Art. 52(2) and (3) and is thus an invention in the sense of Art. 52(1), it is examined in respect of the other requirements of patentability, in particular novelty and inventive step (G-I, 1) (EPO website)."[5]

What we would like to highlight here is that the respect for the patenting requirements is relevant to the maintenance and integrity of the patent system; secondly, in your opinion, we consider very difficult to imagine and accept that an AI can contribute to an invention in the meaning of the inventive step as it is constructed and taken as a subjective aspect (SEKA, 1978); also, as you will be able to see further, "naming" an AI in the patenting document it is not possible as Artificial Intelligences do not possess legal personality and capacity, in the most "genuine" and punctual sense of these fundamental legal postulates, that conform private and contractual law in its constructed history.

Furthermore, since TRIPS did not define the main requisites to comply in the case of a Patent request, we – as human and especially the "legal agents" (lawyers, judges, consultants, policymakers, and academia) – need to find out some alternative in other to interpret the relevant purpose of these patenting requirements (WIPO, 2014); In this same line of thought, we need to critically assess how would an Artificial intelligence possess creativity in the meaning that we, humans, can understand and construct nowadays.

Ultimately, we also point here that, if we could consider an AI as an Inventor - and taking the main goal of the patent system as to promote innovation and creativity throughout the temporary monopoly given by the "State" to the owner (and further, that the inventor is a priori considered to be the owner of the invention); More, that today the patent Offices throughout the world evaluate the patent request based on these three major requirements – the industrial application can be considered as a "normative" requisites; and as well the marketing of the patent is the logical and economical sequence of the developed of a certain Invention, to provide the inventor/owner with the possibility of regaining/recovering the investment involved in the process of that invention.

Ultimately, in the specific regard of European Patent Convention - EPC goes beyond the European Member States/European Union) - besides the three major explicit common requisites of patenting, we need to further recall that this European patent system (EPC) has

[5] EPO - European Patent Office. *Guidelines for examination - artificial intelligence and Machine Learning. Available at: https://www.epo.org/law-practice/legal-texts/html/ guidelines2018/e/g_ii_3_3_1.htm . Last Access in 05. April. 2020.*

"politically" chosen to exclude some subject matters from patentability: *"As a general rule, any purpose that is related to one of the exclusions of patentability under Article 52(2) of the EPC will be considered non-technical. Most notable exclusions are mathematical methods (the reason for excluding fundamental AI technologies), methods for performing mental acts or doing business and presentations of information." (BALLER, 2020)*

Finally, two major "blocks" of problematics arise here:

1) What would be the practical and economical utility to an AI in itself in marketing and selling products that were "possibly" and integrally developed and could patent - considering the monopolist right to exclude that is conferred to the owner/inventor? We could first answer that It would be to manufacture/ produce and sell products that encompass this AI patented invention, to obtain profits;

2) Where, when, and how would the AI spend these "savings"? We could say that the AI would buy assets;

3) How could the AI buy assets if IT does not have legal personality, and further, cannot lawfully enter into a contract to purchase intangible and tangible goods and properties, for example? We could assess the basic ideologies of legal personality to attribute a fictitious and artificial "personality" to the AI;

4) We would do it even if it contradicts the very basic and logical structure of the creation of a legal personality? Why would we do it – the attribution of a fictitious personality to the AI Inventor? Because the AI needs to buy assets, for example;

Second assessment:

5) How could an AI establish a contract with a consumer, taking into consideration the necessary information "equivalence" requirement in B2C contracts? We could consider an "implied" or indirect contract, for example;

6) But this does not undermine all the developments made concerning consumers' protection? We could provide strict liability rules and tortious liability "concepts" to protect consumers;

7) Considering the efficacy and speed of the AI mechanisms of managing information, how the asymmetry of information would be corrected, fixed? Here, we also could provide strict liability rules and tortious liability "concepts";

8) We could further think in the case of an nonexistence written contract with the consumers: how it would be possible to interpret this legal relation observing the

commonly established principles of good faith, and especially the standard duty of care, for example? How we could measure it in the "social relations" established by this AI as an inventor?

9) Lastly, in the other hand, if we would consider the AI as an employee of the invention's owner; that the AI would transfer and assign its patents rights of exploitation to the "subsequent" owner of the patent – a company or a person: how the Artificial intelligence can "form" a contract of a succession of rights? Or an employment contract, for example? We could assess the basic ideologies of legal personality to attribute a fictitious and artificial "personality" to the AI, as previously said;

10) And again, why?

3 CONCEPTIONS OF ARTIFICIAL INTELLIGENCE

In this brief session, we would like to provide the readers with only the particular definitions related to the AI systems into the legal "contour" of liability, personality, and ethics; we did not find it necessary to come up with an original concept due to the diverse amount of definitions and studies, in multidisciplinary "arenas".

We shall take the following conception also brought by Ameet Joshi, 2020 (pg. 67)*: "It is a machine that is capable of processing large amount of data coming from various sources and generating insights and summary of it at extremely fast speed and is capable of conveying these results to humans in human- interaction, e.g., voice conversation." (JOSHI, 2020)*

Therefore, we will further observe and revise the primer opinion of Woodrow Barfield about the AI topic: "*I use a broader definition of intelligence; when I use the term, I mean to describe artificially intelligent machines which can perform cognitive, perceptual and motor tasks at human levels of skill*." (BARFIELD, 2015)

And we also appeal to this same author to shortly present the notion of Singularity of the Artificial Intelligence systems:

> Even though "intelligence" is used as the key factor in discussions of the coming Singularity, I think the more important issue for humanity to consider, is that of "sentience," that point in time or development when an artificially intelligent machine claims to be conscious and alive. When that happens, and I believe it will by the end of this century, it will get interesting. I, for one, would have no problem pulling the plug on a machine smarter than me, but clearly not conscious; whereas, I would have difficulty pulling the plug on a machine that convinces me it is conscious and not a threat to humanity." (BARFIELD, 2015, pg. 45)
>
> "Whether these tools and one's to be developed will be sufficient to reach the Singularity, stay tuned, we will likely find out in the next few decades. In my view,

> unlocking the mysteries of the human brain is a necessary requirement for the Singularity to occur and for machines to become sentient." (Ibid, pg. 47)

Therefore, we could consider that singularity would be a self-assessment concept: if AI technologies and tools are not "singular" neither sentient nor conscious about themselves, for example, how could they invent something, in the genuine terms of what is an invention? We will further come back to this point, as we consider the need for "diversity in thinking" for someone or some group to be able to create an invention that will concretely turn into a registered patent.

A further assessment regarding the definition of Artificial Intelligence (observing its utility, "Adequacy" and terminology concerning the legal system) was provided by the European Commission in its study of 2018: *"On the outside, a generic AI example is formed by knowledge bases (also known as 'expert systems'), which is essentially a storage of data and a set of rules to draw logical conclusions from this data. Both the data and the rules must be supplied by the operators of the AI." (EC, 2018)*

In this sense, we directly focus on the observation made by Daryl Lim (2018*): "It is unlikely, though, that an AI can qualify as an inventor under current law. Conception can be performed only by natural persons because AI has no mind to speak of."*

Furthermore, in this regard of the very strict concept of "Technology" Singularity, we just refer to the questions posed by the European Technology Industry, *"This has meant taking a deep dive into the fundamentals of AI: what exactly does it mean in an industrial context? What are the learning and decision-making techniques used in industrial AI algorithms? Is there really a danger of industrial AI beginning to 'think for itself' and take actions beyond its intended scope that could be harmful to humans?" (ETI, 2019)*

We will precisely discuss the potentiality of harming consumers when we address AI' liability critics; therefore, since this "Artificial Machines" do not have legal personality & cannot acquire assets (we further think in the "Value" of considering the AI system as the Inventor – for us, it is truly unreasonable and disproportionate) – amounting, for us, into a highly harmful environment – finally taking the Artificial Intelligence as the creator of an "industrial" invention would undermine, in nature, consumers' protection - as we even could consider an increased risk & danger for consumers (KEATING, 2019), since AI methodologies are not transparent.

And we just briefly present the specific concept of opacity in the sense introduced above: "*They should be interpreted as expressing a need to impose some form of restrictions*

on the development and implementation of a powerful, potentially independent, opaque, and complex technology in core social functions and markets." (LARSSON, HEINTZ, 2020)

In this regard, we already know the relevance of Consumer protection within the European market (VALANT, 2015), & further, as we will develop in this work, Data has necessarily to be provided by a human actor, which ascertain the impossibility of AI being considered differently advantageous due to a pretentious impartiality/neutrality, in the final sense of human interference in AI information input, resulting finally in the existence of bias in AI systems; therefore, we shall perceive a kind of "human supervision" regarding the initial Input of data, and further the need for control – and even Refinement - by the human inventor of the results in prior-art search to correct bias and errors, for example; Consequently, the Inventor will be the Human that "prefers" to use AI as a Tool & as an auxiliary to the creation of an invention, accounting the potential benefits in data processing speed of Artificial Intelligence methods.

Also, we need to understand the mechanisms of "thinking" of Artificial intelligence, and to pursue this endeavor, we revise what was said by Tobias Blanke about the "geometric" analysis and rationality of AI:

> In the world of AI, we are interested in meaningful information spaces that do not count all available information but only information, which can 'feature' in the calculation of a problem. […] Together, these features span an abstract information space using 'vectors' of features."
>
> "Decision-making algorithms plot data as points/dots in feature spaces, which thus become a geometrical representation of all the data available to them. Each dot in this space is defined by how much abstract space is in-between it and the other dots in the same space, or how distant they are from each other. […] Machine learning algorithms manipulate this feature space to create labels for each example that can already be found in the feature space or that might be found in the future in the feature space. They 'partition' the feature space into zones of comparable features. Each data point in these zones is labeled the same way. Labeling is the materialization of decision-making by machine learning".
>
> "Firstly, one can literally 'see' in the feature space why one cluster is different from the others and an outlier. […] Finally, the clusters that are not outliers build a dynamic, algorithmic model of normality. Non-suspicion or innocence is determined by declaring some cluster to be not outliers, while anomalies are outside any cluster. The geometrical distance in the feature space makes outlier dots stand out as outliers."[6]

In this same sense, finally, we further explain about the differentiated robotics' rules: "The diversity of subfields of the knowledge representation range is unified by the central problem of encoding human knowledge in such a way that the knowledge can be used. AI has

[6] BLANKE, Tobias. *The Geometric Rationality of Innocence in algorithmic Decisions*. (jstor platform access) *Available at: http://www.jstor.com/stable/j.ctvhrd092.15 . Last Access in 20. April. 2020.*

to solve problems which require extensive knowledge about the world. This is why artificial intelligence knowledge must be acquired and represented in special language like first order logic and coded to make it possible for machines to manipulate." (TURNER, 2019)

A third assessment of the conception and processing behind Artificial Intelligence Technologies was recently said by the Commission: "AI needs vast amounts of data to be developed. Machine learning, a type of AI, works by identifying patterns in available data and then applying the knowledge to new data […] Once trained, algorithms can correctly classify objects that they have never seen […]" (EC, 2018)

In this sense, we shall better assess the fundamental necessity of Data input required by an Artificial Intelligence System: we could notice that the human Inventor will finally be the agent who provides the primer sets of information which is being processed by the AI, leading us to further consider this human agent/actor as the real inventor of the patent, that consequently chose to use AI to speed up the "process", for example.

Fourthly, the capacity of processing huge sets of data is consolidated & further recognized by other authors; furthermore, in this sense, we shall consider the capability of the Artificial Intelligence of predicting or "prescribing" information in a differentiated processing speed[7]: "In many cases, the response time of an automated control system is sufficiently faster than that of a human, so machines are better able to take advantage of the higher fidelity predictions generated by artificial intelligence compared to predictions generated by humans." (AGRAWAL; GANS; GOLDFARB, 2019)"

Therefore, we "accept" the great benefits AI can provide as a tool, especially in the patenting system, since the volume & amount of data processing is a major characteristic & requirement in the meaning of the extensive prior-art search needed to rend the invention patentable. Further, we shall perceive the necessity of human monitoring before and after the employment of AI in this searching, since humans need to "prepare" & provide Data, and after all, "check" the final results offered by the AI, due to the lack of Transparency inherent of these "Artificial" systems/technologies (the use of AI as a tool, as well as the transparency-explainability concerns about Artificial Intelligence methods will be later discussed in more detail in the present work).

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[7] "*AI plays varied functions in these applications. AI systems can be descriptive as they tell you what happened; diagnostic as they tell you why something happened; predictive as they forecast what will (statistically) happen; and prescriptive in being capable of performing actual decision-making and implementation.*" (GIUFFRIDA, Iria. *Liability for AI Decision-Making: some legal and ethical considerations*. 2019. *Fordham Law Review; Volume 88; Issue 2; Pages 439 to 456; Available at: https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=5627&context=flr . Last Access in 24. April. 2020.)*

We presented the excerpts above having the final intent of providing the "mathematical" view and display of the AI "intelligence", that utilizes this "labeling" process (we could also consider a type of categorization/classification) to achieve its ultimate goal; we believe that the employment of these methods makes the Artificial Intelligence a "quicker processor" of all the available data, achieving results faster: this constitutes the major and main feature of the use of AI in the Patent system since the AI "methodologies" can further help human-beings in researching for data, as this is the primary requirement of a patent: to evaluate the state of the art throughout prior art search.

Also, the difference that can be noted is the labelling method/system that provides AI with the probability/possibility of processing Data in a higher speed, in which AI technologies, "entrusted" with its intrinsic goal-oriented purpose, will "discart" and/or set aside irrelevant information, prioritizing the "correlated" data to come to a specific result (MUSY, 2000). Further, taking into consideration that AI methodologies do not operate in "data vacuum/blank"(GIUFFRIDA, 2019), it will necessarily require the input of Data by human "trainers" and/or managers, amounting to the real contribution of the Human agents, which will have to be considered finally the Inventor; therefore, for us, the existing structure of the Patent' system is taken as adequate in the meaning of grating the exclusive patent' rights to the Human Creator, that elected/ chose to employ Artificial Intelligence Tools, and we further believe this "reassemble" to a distinctive advantage in relation to the development of a patentable creation/invention, and further possibly provide a competitive "benefit" in the later marketing of those inventions into products.

Furthermore, we need to assess what the European Commission recently (2018) said about these two major issues of rationality and decision-making process "implications" in AI systems, in a "definition report" of the Independent High-level Expert group; firstly, concerning Rationality, the report states that "This refers to the ability to choose the best action to take to achieve a certain goal, given certain criteria to be optimized and the available resources. Of course, rationality is not the only ingredient in the concept of intelligence, but it is a significant part of it." (EC, 2018)"

Moreover, the report specifically approached the other four major characteristics of AI systems: goal-directed[8]; transparency[9]; "explainability" & black-boxing[10]; to follow a more didactic structure, both of those last characteristics will be further "accounted" in the last two chapters of the present written work.

In the following sessions, we will further address how the "opacity" of AI-related to the liability issues, as civil law liability mainly requires a nexus of causality between the "event" and the "occurred damages"; since the "previous history" of the rationality employed by the AI in a certain patent will not be entirely recovered, how consumers of the patented AI products will prove the needed causality – that further serves to measure the economic benefit to be obtained regarding the damages suffered? Legal scholars provide several answers and alternatives to this problem, but we truly believe that this question is not completely resolved, what make us consider that an AI will be a tool, improving certain Invention that will be registered within the patent system by a "true and concrete" Inventor.

Further, one of the major conditions of the patent system is providing the maximum disclosure of the inventions that are filled within the patent offices around the world, in the legal scope of the claims presented; this is intrinsically related to the important requirements of inventive step and "industrial applicability", as previously provided in this present work: the inventive step will be evaluated considering the figure of a skilled person in the field, and this "individual" will, based on the patent documents (claims and detailed description)[11], assess how

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[8] "*Current AI systems are goal-directed, meaning that they receive the specification of a goal to achieve from a human being and use some techniques to achieve such goal. They do not define their own goals"*. (European Commission. *A definition of AI: main capabilities and scientific disciplines*. 2018. *Available at: https://laurentcervoni.fr/ wp-content/uploads/2019/01/definition_of_ai_18_december.pdf . Last Access in 22. May. 2020.)*. This specifically shows that the AI systems are not so independent as some scholar's support, as they still require some human "control"; therefore, we should definitely consider that AI systems employed in invention today are used as a "maximizing" tool, and they need to be recognized as it, as well as regulated within this consideration.

[9] "*It is important to notice that this approach (as all machine learning techniques) has always a certain percentage of error, albeit usually a small one. So, an essential notion is the accuracy, a measure of how large the percentage of correct answers is"*. (European Commission. *A definition of AI: main capabilities and scientific disciplines*. 2018. *Available at: https://laurentcervoni.fr/ wp-content/uploads/2019/01/definition_of_ai_18_december.pdf . Last Access in 22. May. 2020.)*

[10] "*Some machine learning techniques, although very successful from the accuracy point of view, are very opaque in terms of understanding how they make decisions. The notion of black-box AI refers to such scenarios, where it is not possible to trace back to the reason for certain decisions"*. (European Commission. *A definition of AI: main capabilities and scientific disciplines*. 2018. *Available at: https://laurentcervoni.fr/ wp-content/uploads/2019/01/definition_of_ai_18_december.pdf . Last Access in 22. May. 2020.)*

[11] To further assessments about this topic in correlation to the content of the patent application and the rights' legitimacy provided to the inventor by the granting of the patent, please see: *SEKA, Georg (Editor). European Patent Law – practicing under the European Patent Convention (EPC). 1978. Fred B. Rothman & Co. Publisher. 249 pages. (translation into English) – physical book*

to “reproduce”/realize and implement the Invention, without having major difficulties or “doubts”? Therefore, how the skilled person will assess the invention to evaluate its compliance with the fundamental requirements of patenting?

4 LEGAL PERSONALITY ASSESSMENT TO THE PURPOSES OF LIABILITY

As previously stated, related to the main liability issue, we would have to assess the necessary legal personality “condition” in the AI’s: “*In addition, to give a real dimension to liability, electronic agents would have to be able to acquire assets on their own. This would require the resolution of several legislative problems related to their legal capacity and how they act when performing legal transactions.” (EC, 2019)*

Therefore, we would factiously give/provide AI systems with a “certain type of personality: with the sole objective of providing the possibility of acquiring assets to the AI: we believe this is contradictory with the very own purpose of the fundamentals of personality in/for the Law.

Some scholars' argument that AI “methodologies” could have personality in the same line of comparison to the “corporate” personality of the companies; they seem to forget that there are individuals “behind” the company, composing it – this was a legal category historically constructed to protect people and their person properties, from their businesses endeavors; In our situation, if we advocate that the AI can be an Inventor, we would desire to “exclude” the “human element”, providing more independence and autonomy to the Artificial Intelligence. In this sense, some authors even go further in stating proposing the “piercing of the electronic veil” (EC, 2019); We truly consider this is disproportionate & inconceivable,

inaccurate[12], unreasonable, non-realistic & infeasible[13], and further, even counterintuitive; for us, it goes beyond legal standards of certainty.[14]

In this regard, we just state Anyoha's overview of AI's "inconceivability"[15] since we follow his argument: *"To me, it seems inconceivable that this would be accomplished in the next 50 years. Even if the capability is there, the ethical questions would serve as a strong barrier against fruition. When that time comes (but better even before the time comes), we will need to have a serious conversation about machine policy and ethics (ironically both fundamentally human subjects)." (ANYOHA, 2017)*

[12] Revising Cambridge Dictionary, the term "Inaccurate" means "*not completely exact, or not able to do something correctly*". (Cambridge.Com (Dictionary). *Inaccurate*. *Available at: https://dictionary.cambridge.org/dictionary/english/inaccurate . Last Access in 08. June. 2020.)*
The Black Box issue, as it will be investigated in this subtopic, concerns the idea of liability surrounding AI, and it reflects the impossibility of Artificial Intelligence systems of showing - clearly & in a transparent away – how data is processed after "receiving"/apportioning all "images and information" inputted (Van der Heijden, 2019), & consequently, how the final result is achieved; Therefore, for us, AI cannot be accurate further in this very own sense of not comprising the sufficient transparency needed to be taken as an Inventor (this argument further reiterates our "mindset" of "deeming" Artificial Intelligence as a potential tool to be used/employed in the patenting system).
Further, Nata Silver brings, concerning big data analytics, *"We're not that much smarter than we used to be, even though we have much more information—and that means the real skill now is learning how to pick out the useful information from all this noise*." (DELOITTE, 2017)
Briefly applying a kind of analogical criteria, we should consider the employment of AI techniques due to the processing speed of data in those methods, finally providing help to human inventors in patenting inventions;
Lastly, in this regard, as the Black Boxing is still conformed in AI tools, we could further consider "impossible" to predict the final result/decision given by an AI, and it is not possible to "trace back the path", the process taken by the AI in taking a certain decision.

[13] We shall follow the statement made by MacMillan surrounding the scope and assessment of "reality": the expression non-realistic *is "used about an artificial object or substance that looks very much like a natural object or substance*". For us, it is clear the connection between this definition and AI's conception;

Furthermore, as the brain is not computable (REGALADO, 2013) and taking into account the history around AI creation itself (the creation of the first AI system by a human being), Artificial Intelligence is intended to "mimic", "imitate", & "exhibit human-LIKE" behavior: in this sense, as AI is intrinsically non-realistic, we also should not consider an AI's creation as real. (YU; ALI, 2019). Finally, it seems clear to us that "attributing" an Invention to Artificial Intelligence, throughout grating patent's rights to "it", is infeasible due to the abstract nature of the Artificial Intelligence system.

[14] Not even entering the evaluation of certainty in the legal sphere & considering or not a Cartesian assessment of something being certain, "*Certainty is interested in part due to its potential connections to knowledge and skepticism. Some arguments seem to show that knowledge requires absolute certainty*." (Standford Encyclopedia of Philosophy. *Certainty*. 2008. *Available at: https://plato.stanford.edu/entries/certainty/#ConCer . Last Access in 08. June. 2020.)*
In this sense, we will just affirm that the Black Boxing issue - that will be further developed in the present chapter, in the following pages - puts Artificial Intelligence "in the other side of certainty" (our words), since there is no possibility of total transparency concerning the process (which steps are taken, how data is measured to the taken the final decision) pursed by the AI to achieve the result, in the meaning of referring to the goal-oriented "intrinsically" characteristic of AI.

[15] Inconceivable: "so unlikely as to be difficult to believe" (MacMillan Dictionary); OR "extremely unlikely" (Cambridge.com).

Therefore, we can rely on that recognizing the inherent features of Artificial Intelligence are crucial to determine its "legal and ethical uses", which prompt us addressing the correct guidelines and rules to handle AI within the Human society.

Semantically, we also can assess the Open Letter to the Commission rendered by Robotics & AI's Experts, *"It is highly counterintuitive to call them 'persons' as long as they do not possess some additional qualities typically associated with human persons, such as freedom of will, intentionality, self-consciousness, moral agency or a sense of personal identity." (Politico Eu, 2018)*

We do not agree with this, since we truly believe that AI techniques are potentially able to further help the "community" to innovate, in the away they have huge capacity in processing data in a very efficient speed, with the usage of diverse types of classifications and categorizations and even "labeling", as we brought in the first Chapter of this work; As you can see from the previous paragraph, we could think that the indirect purpose of conferring legal personality would be the "external advantage" of the AI into acquiring assets, and not protecting it from the risk commercial transactions within the meaning of commercializing the inventions, for example.

In this regard, we need to remember the particularities of the patent requirements: it integrates intellectual property common knowledge that patents will be addressed by the Offices to be granted (and a priori hold) to individual inventors, not even companies, for/ because of very special reasons (PATERSON, 2001); therefore, we believe that any attempt – at least for now – to artificially provide "AI methods" with legal personality would contradict and undermine the contemporary patent system.

As it was presented in the Commission report (liability of AI and emerging technologies), in 2018, some policymakers and professionals even try to propose what they called as "e-personality", but we believe that the same problem remains: you are going to "artificially" provide the AI with this legal personality with solely the "superficial" purpose of acquiring assets, to be able to substantiate an alleged liability of the AI system to further "construct the needed environment" to "demonstrate" the Artificial Intelligence as the single inventor of a patent.

In this sphere, furthermore, it is important to present the following related to the interplay between,

> "For all the foregoing, the question "could Artificial Intelligence become a legal person" is still only theoretical from today's perspective. While the EU-driven RoboLaw project that will promote the development of guidelines governing the operation of robotics, including AI, is being carried out, AI has no legal personality.

> Therefore, in litigation for damages, AI may not be recognized as an entity eligible for the compensation of damages. However, in terms of law, a situation where damages are not compensated is impossible. The legal system establishes liability of those responsible for the injury, the so-called "legal cause" of the injury. But if AI is not a legal entity, who is to compensate for damages caused by it?" (CERKA, GRIGIENE, SIRBIKYTE, 2017)

Moreover, as it is going to be developed in the next topic, we believe in would even be "unfair", and legally unethical, to accept the Artificial Intelligence as the inventor, disregard its current impossibility of being held liable, and "transferring" deliberately this responsibility/liability to other agent(s), without any further assessments or considerations. In this sense, we further compliment*: "Thinking about policy and law, if a machine with artificial intelligence could generate its own code, heuristics, and algorithms, would the artificial intelligence or human (manufacturer, owner, 3rd party) be responsible for its actions? (BARFIELD, 2015)*

Personally, in our view, the conclusion is further simple: the patenting system is well constructed and consolidated since it comprises the idea of "technical neutrality" (GREENBERG, 2016).

Further, taking into account our specific framework into patents' rights, we believe that considering AI "semantically" as an Artificial Intelligent system (LIM, 2018, as He refers to the primary robotics' testing/experiment of Alan Turing) demonstrates its "initial" capacity to mimic human intelligence & knowledge – as/and we need to remember that no "engineering" can reproduce or compute the Human Brain (REGALADO, 2013).

Furthermore, the particularities of AI methodologies reside majorly in the speed of data processing, as Artificial Intelligence depending on information input provided by Human Inventors; Finally, the human owners of marketed inventions are already held liable in the case of harms or damages to consumers, and this "tendency" should continue to apply in the final sense of AI tolls employed by the inventor – considering the owner is taken as the inventor *a priori*, within the contemporary patenting system.

Moreover, conferring any kind of legal personality to an AI tool, with the unique purpose of financial "redress" and compensation within the liability framework, would undermine the very final objective of the patenting system as it is to promote innovation for/in the society in its entirety, observing a greater public interest, throughout the means of granting a temporary monopoly to the inventor or the owner of the patent in question. (GIUFFRIDA, 2019) In this sense, we just felt important to bring the doctrinal comments of Dan Burk & Mark Lemley:

> Patent law is our primary policy tool to promote innovation, encourage the development of new technologies, and increase the fund of human knowledge. To accomplish this end, the patent statute creates a general set of legal rules that govern a wide variety of technologies. With only a few exceptions, the statute does not distinguish between different technologies in setting and applying legal standards. Rather, the Supreme Court has held that patent standards in the United States are designed to adapt flexibly to both old and new technologies, encompassing "anything under the sun that is made by man." In theory, then, we have a uniform patent system that provides technology-neutral protection to all kinds of innovation […] Technology, however, is anything but uniform, and displays highly diverse characteristics across different sectors."(BURK; LEMLEY, 2003)

Finally, we also felt necessary in this majorly legal subtopic to highlight the relevance of the development of a human-centric AI especially in the context of the European Union: *"The European Union must create an actionable framework for innovative and reliable AI and Robotics to spur even greater benefits for the European peoples and its common market." (HIGGINS, 2019)*

5 BRIEF CONCLUSIONS

After passing by the methodological framework and construction of this paper; the international and communitary structure of IP - Intellectual property, including patent rights; and the attempt of giving and bringing a concise and precise definition of Artificial intelligence, this study redirected its final considerations above surrounding the most basic and exemplary figures and institutes of civil law: personality and liability.

Further, the technical and legal details studied here demonstrate the limitations of the present article, since AI is an emerging technology from which the technical problems are still arising and consequently the law, and the legal system as a whole in certain country and region, will try to prevent harm and damages, and protect rights historically and constitutionally acquired by humans from a human-centric perspective.

Therefore, disruptive innovation is expected, however, the legal appropriation of technology will not be actualized at the same rhythm as the different technical emergencies, and these are the next chapters of contemporary history including for intellectual property and patents.

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