

**IMPLICATIONS FOR THE INVENTIVE STEP UNDER THE EUROPEAN PATENT CONVENTION
RELATED TO THE INCREASING APPLICATION OF ARTIFICIAL INTELLIGENCE AND
CERTIFICATION AS A SUI GENERIS PROTECTION MECHANISM FOR CREATIONS
INVOLVING ARTIFICIAL INTELLIGENCE¹**

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Received: 28 March 2023; accepted: 15 May 2023

DOI: <http://dx.doi.org/10.13165/j.icj.2023.06.010>

Abstract. The purpose of this article is to observe whether the European Patent Convention avails protection for creations involving Machine Learning regarding its current and future development. The article analyzes in more detail the notion of compliance with the requirement of an inventive step under the European Patent Convention when using Machine Learning becomes routine. The article concludes that, due to the specifics of Machine Learning, comprehensive protection for creations involving it would require conceptual amendments to the European Patent Convention. The author argues that instead of fundamentally amending the European Patent Convention, certification as a sui generis protection mechanism for creations involving Machine Learning could be a potential solution. The article further builds on and develops current academic proposals, providing an overview of the wider framework. The paper relies on the descriptive, analytical, historical and comparative legal methods to substantiate the main argument.

Keywords: artificial intelligence, patent, obviousness, certification.

Introduction

Artificial Intelligence (hereinafter – AI) and Machine Learning (hereinafter – ML), a subfield thereof, have considerable potential to augment the prosperity of humans. Due to this, their application is becoming more widespread. As a result, this might trigger challenges related to the examination of the obviousness of the patent under the Convention on the Grant of European Patents (hereinafter – the EPC; The European Patent Office [EPO], 1973; European Commission Directorate-General, 2020, pp. 109–111).

Furthermore, there is a stance that compliance with the concept of an inventor is more challenging for ML regarding the system developed under the EPC (Iglesias et al., 2021, p. 22). The author has already addressed numerous other hurdles that ML poses related to the EPC, including: 1) sufficiency of disclosure (Rudzite, 2022a); 2) inventorship (Rudzite, 2022b); and 3) patent eligibility (Rudzite, 2023). Some of these issues are in the distant future; however, considering the rapid development of ML, current issues have to be addressed in the present.

A complex solution to the rapid development of ML might be preferred because ML encounters various issues regarding compliance with the EPC. Nonetheless, some aspects might require fundamental amendments, such as the concept of inventorship (*Designation of inventor/DABUS*, 2021, 4.6.6). Alternatives include opting for trade secret protection that, on the contrary, would slow technological progress,³ or choosing an open-source approach, neither of which might be preferred.

¹ The author acknowledges the involvement of Prof. Aleksei Kelli and Prof. Martin Ebers of the University of Tartu who provided valuable input.

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³ Trade secret protection would deprive the enrichment of common general knowledge, since those who need a particular technology would have to create it from scratch. Additionally, it would indefinitely impair the transparency and explainability of the decision-making process (Pendleton, 2022, p. 127; Foss-Solbrek, 2021, pp. 257–258).

As its main argument, this article proposes that instead of diluting the EPC or forcing creators to choose between the non-desirable scenarios mentioned above, implementing and recognizing a *sui generis* patent-like mechanism for ML creations might be favored. The article builds upon existing academic proposals (Norvig, 2020; Samuelson et al., 1994, pp. 2423, 2426–2429) and develops them further, suggesting certification and providing a preliminary framework of the concept.

Certification is offered as a voluntary patent-like protection mechanism similar to utility models. The primary aim is to provide optimal protection for creations involving ML in those aspects where existing intellectual property (hereinafter – IP) regimes stop. Ideally, certification could be recognized as industrial property rights availing the benefits of existing regimes, such as regarding enforcement. In this regard, certification is provided as an addition to the current frameworks of industrial property specifically for creations related to ML; thus, it would not substitute or duplicate them. Depending on the aim of certification, it could result in: granting economic rights (for a human or a legal entity) or the possession of property as human rights; the recognition of moral rights (for a human); the recognition of the role of ML in creation; or as a non-binding, impartial expert opinion. Certification is framed dynamically, allowing its adjustment towards future technological development.

This article relies on the descriptive, analytical, historical and comparative legal methods. Primary legal acts, such as the EPC and the EU, and secondary legal sources, including academic publications and case law, are considered to evaluate the principal argument of the paper. The article is divided into four sections and sub-sections, within which the specifics of ML, issues related to evaluating the inventive step under the EPC when the application of ML becomes routine, and the proposed certification mechanism are analyzed.

Under its territorial scope, the article addresses issues related to the patentability of creations involving ML under the EPC. Except for touching upon aspects of the recognition of the role of ML in the inventive process, the article does not elaborate on further hurdles related to compliance with the EPC requirements for inventions generated by AI, which falls outside the scope of this analysis.

1. Machine Learning

AI and ML, its subfield, are areas of computer science that differ from traditional programming because their programs are formed when an ML algorithm processes inputs and underlying patterns between input and output data. In other words, output and data form a program (Esteva et al., 2019, p. 24). The function of ML algorithms is to capacitate learning and produce an end model for the right task. ML algorithms have various types, ranging from simple linear regression (that perform straightforward tasks) to sophisticated deep neural networks (that iterate more profound interrelations between the input data) and others (Sevahula et al., 2020, p. 1). Model preparation requires numerous steps (Kim, 2020, p. 449).

The accuracy of ML depends on the complexity of the model and the quality of testing, training and input data. More data allows more learning, and enables new outcomes to be presented. Additionally, the ability to process large datasets with heterogeneous natures and increasing generalizability makes ML applications preferable in many areas, including drug discovery (Zemouri et al., 2019, p. 8).

The specifics of ML that differentiate it from other areas encounter hardships when complying with legal frameworks developed before their era. In addition, ML will also pose challenges in the future when its application becomes routine. One issue involves examining the inventive step requirement under the EPC.

2. The Inventive Step

2.1. The Current Framework

Article 56 of the EPC defines the requirement of the inventive step as follows: “An invention shall be considered as involving an inventive step if, having regard to state of the art, it is not obvious to a person skilled in the art”. “Obviousness” does not exceed the normal technical process, and relates to the natural or logical observation of the prior art. Furthermore, “prior art” relates to all publicly available materials (solo or in combination) at the relevant date. The “person skilled in the art” is a fiction, and stands for a skilled practitioner (or group thereof) in

the fields of the claimed invention that has access to all available materials and existing means for routine experimentation.

The problem-solution approach has been developed in the case law to alleviate the evaluation of the inventive step (which does not comprise *ex post facto* analysis) as follows: 1) the determination of the closest prior art; 2) the formulation of the solvable, objective technical problem (achievable aim); and 3) the evaluation of obviousness. “Obviousness” might be present when there is a “long-felt need,” “surprising effect,” “remarkable technological progress” (which requires some creative activity) or other such indicator (Haedicke & Timmann, 2014, pp. 177–199).

Due to its use of open-ended terms, the framework poses challenges regarding compliance and clarity. The rapid development of ML might reach a point when it becomes a routine practice and application. In this regard, novel implications might appear.

2.2. *The Implications of ML*

If the application of ML becomes a routine practice, it might pose challenges related to the evaluation of obviousness for a person skilled in the art. Namely, due to the ability of ML to search large amounts of information, the bar for inventiveness will be significantly raised (Blok, 2017, p. 71). Additionally, this raises an issue regarding the definition of a person skilled in the art (with or without ML as an ordinary tool for routine tasks, what kind of ML, and other issues).

It must be outlined that the technical capabilities of various tools at the relevant date are also known to a person skilled in the art since they have to be cognizant in the state-of-the-art technologies in the field (*Efomycine als Leistungsförderer/BAYER*, 1992, para. 4.4.; *Combustion engine*, 1990, paras. 6.1.–6.2.). Nonetheless, except in straightforward cases, the novelty of a combination of even previously known features, if considered in isolation, is decisive (Muir et al., 1999, p. 164). Hence, the fact that ML applications might become widespread and set a new “normal” cannot be deemed as a paradigm exclusively related to ML. It is established case law in the Board of Appeals of the EPO (hereinafter – EPO BA) that inventive is not technologically normal development (EPO BA T 0232/01, 2002, para. 2). Therefore, an analogous aspect could be related to numerous items – for instance, a calculator, a computer, and others.

Currently, non-obviousness is perceived to represent a surprising effect, remarkable progress, an accelerative impact on further technological development, a switch to another approach, social perception towards the effect that a creation causes (for instance, that it increases road safety), and other impacts compared to the prior art (Haedicke & Timmann, 2014, pp. 195–196). In this regard, this approach can also be applied analogously to future situations to distinguish non-obvious creation.

Therefore, it is at the essence of the patent system to maintain a level of inventiveness and facilitate technological progress (Leith, 2007, p. 187). Nevertheless, the practical meaning of this paradigm has to be observed more closely. That is the focal point of the following sub-sections.

2.2.1. The Perception of a Person Skilled in the Art

The fiction of a person skilled in the art outlined under Article 56 of the EPC in conjunction with the Guidelines for Examination (EPO, n.d.-i) presumes that said person is an expert in the field. In this regard, a person skilled in the art is deemed as being consistently involved in the technology development process (*Efomycine als Leistungsförderer/BAYER*, 1992, para. 4.4.), and is knowledgeable on the state of the art (*Combustion engine*, 1990, paras. 6.1.–6.2.). Hence, said person forms their knowledge not only from the specific field of the problem addressed in the patent claim, but also from the wider generic area and even neighboring sectors. This person is expected to be aware of the normal technological progress of those fields at a level that does not exceed it (EPO, n.d.-h).

AI and ML have been evolving for some time, as have applications in numerous fields (Feldman & Bajorath, 2020, pp. 1–3). Furthermore, the EPO has even developed separate guidelines for the examination of inventions

involving AI and ML (EPO, n.d.-a). Thus, a person skilled in the art might be deemed to be aware of those general applications of AI and ML.

2.2.2. Other Aspects to be Taken into Consideration

2.2.2.1 Related to ML

It must be stressed that ML differs from traditional programming. Namely, the crucial part of building an ML program is a correlation between an algorithm and input and training data (Esteva et al., 2019, p. 24). In this regard, any random ML would not be able to achieve the same outcome. In other words, although ML tends to be generalizable (to be applicable for more than one purpose or field), this is not a trivial task if the ML program has not been built with particular abilities (Eche et al., 2021, p. 1). Thus, any outcome would be inaccurate without the appropriate training and input data (Barzamini et al., 2022, p. 181). Additionally, the EPO BA in case T 161/18 (*Äquivalenter Aortendruck/ARC SEIBERSDORF*, 2020, para. 2.2) confirmed that without the disclosure of the specific training, input and testing data, a skilled person is not able to repeat an invention.

Moreover, for ML to access the appropriate closest prior art and remote technical fields, an examiner must initially determine the respective datasets. Moreover, those datasets might not be deemed to be made available for ML, but may instead be protected trade secrets (European Commission Directorate-General, 2020, p. 110). Consequently, ML is as accurate as the underlying algorithm and testing and training data.

Therefore, the crucial part before presuming that a person skilled in the art can use ML is to conclude on the public availability of the respective datasets to reveal the prior art and the extent of such availability. In other words, it might be presumed that, in the future, the application of ML might become a routine process. However, for complete reliance on ML to determine prior art, it would first be necessary to have access to all the publicly available materials, datasets, and information.

Another aspect that would have to be decided beforehand is how to perceive the outcome of ML. ML can be trained on ready-made end-products (for instance, monographs) and raw data that has yet to be converted into information. Furthermore, various ML algorithms exist for different purposes. For instance, simpler algorithms aim to conduct pure classification, while more complex forms learn a generalizable representation of underlying correlations (Russel & Norvig, 1995, pp. 578–580). Thus, an agreement would have to be reached as to whether it might be presumed that ML would apply only to documents that represent ready-made end-products, or also to raw data. If it was decided that ML should be applicable to raw data, it would have to be decided whether ML has to perform only the recognition and classification of raw data or process them, converting into information.

A consensus would have to be reached as to what functions applicable ML would have to conduct – would it only find sources, or further process them to determine their interrelationships? The former approach would treat ML as a purely automated search tool. In this regard, an end user would decide on using the received information. However, the latter triggers a decision as to whether the outcome is already a part of the invention (if claimed afterwards) and thus has to be disclosed in the patent application.

2.2.2.2. Related to the Evaluation of Inventiveness

Irrespective of whether the prior state of the art was learned by applying ML, an end-user (a human) will determine the use of the received result. In this regard, a human will decide on the added value of the respective information or its potential application in creating an invention (*Designation of inventor/DABUS*, 2021). The widespread application of ML will inevitably raise the bar for inventiveness because it diminishes non-obviousness. However, it will not deny the ability to find inventive applications, consequently maintaining a high standard for patent protection and facilitating sustainable technological progress (Shemtov & Gabison, 2022, pp. 436–441).

Except for in cases where the solution is straightforward (*Moulding composition*, 1984, para. 16), the decisive factor is not whether separate components are novel but whether the combination of the claimed features is inventive. In other words, whether a skilled person would have achieved the claimed aggregate of features for the solution (Muir et al., 1999, p. 164).

Moreover, Article 52(3) of the EPC excludes algorithms (also comprises ML) “as such” from patentability. Therefore, only those creations involving ML which have “technical character” or present a contribution by technical teaching to the prior art might be patentable (EPO, n.d.-g). Additionally, it is not the unusualness of each feature separately that is decisive, but the composition of separate parts. Moreover, the total synergetic impact (sum) outweighs the effect of each feature individually (Haedicke & Timmann, 2014, pp. 195–196).

Therefore, the increasing application of ML as a concept does not differ from normal progress related to all kinds of technological items (computers, cell phones and others). Since ML algorithms cannot be patented as such, the inventiveness of creations involving ML is evaluated in its own “weight class,” or by comparing inventiveness with the prior art related to the respective ML.

Additionally, Article 83 of the EPC requires sufficient description to also reflect the steps to obtain the product (in product patent claims; England & Cohen, 2021, p. 102). Article 100(b) of the EPC also foresees grounds for revocation of a patent, amongst which are opposition to non-compliance with Article 83. Hence, either the EPO may reject the application based on non-sufficient disclosure if it is obvious that ML has been applied, or it might be revoked under Article 100(b) of the EPC.

Nevertheless, exceptions that might remedy non-disclosure could include a surprising technical effect (EPO BA T 1164/11, 2015, para. VIII) or the ability to retrieve information missing from the common general knowledge. In the former, all constituting components are disclosed, but the process cannot be explained. However, in the latter, the disclosure does not contribute value to the science; therefore, it would not have an impact (*Paper-making method/AVEBE*, 2005, para. 2.3.1).

Suppose the non-disclosure of the even indirect involvement of ML in creating an invention was not obvious. In that case, it might be presumed that the person skilled in the art would consider all approaches, especially the most resource-effective, as potential starting points (*Paper-making method/AVEBE*, 2005, para. 2.3.1). For the determination of the closest prior art, it has to be appropriate for the claimed invention. In other words, if the claim does not address, for example, high-performance computing, it cannot be presumed as a valid starting point (*On demand instantiation/RAYTHEON*, 2016, para. 6.5–7).

Overall, there is a stance that even if only one case solving this problem in the general field has been revealed, it is presumed that the same could be attributed to related specific areas (Haedicke & Timmann, 2014, pp. 190–191). The exception to this is pioneering technical research fields, where only one publication or patent specification might indicate inventiveness (*Starting compounds*, 1988, para. 9). If no prior art exists, novelty instead of inventiveness is rewarded (Leith, 2007, p. 187). Nevertheless, due to the specifics of ML and its particularly high reliance on concrete datasets, an ML algorithm applied as a solution for an individual problem in the general sector seemingly might not be generalizable, and may be unable to be automatically applied to address the issue in the selected sub-field. This might appear especially with genetic programming algorithms that include an element of randomness (Koza et al., 1999). Consequently, conducting actual testing would exceed seemingly routine experimentation for a person skilled in the art. In this regard, the usage of ML may not be deemed as a viable starting point. To consider building a new ML algorithm, sufficient general knowledge must be present according to the current stance of the EPO.

Hence, currently, the only occasion in which a person skilled in the art would be expected to apply ML to verify compliance with Article 56 of the EPC is if the description of the claim mentions the involvement of ML. Otherwise, the legal rationale substantiated by the EPC is missing the requirement for the skilled person to: 1) figure out what kind of ML algorithm to build; 2) establish the type of datasets to train and test the model on and what input data to insert to achieve the outcome; 3) gain access to the desired datasets; and 4) decide on the features that should be added to provide the accuracy of the results outside the testing environment, hence the realizability and repeatability of an invention (EPO, 2020, p. 384).

Conversely, if the usage of ML becomes routine, it might be presumed that a skilled person will apply ML regardless of what the patent application discloses (Lee et al., 2021, p. 149). In this regard, it would be necessary to initially determine the capabilities of ML algorithms that are deemed to be state-of-the-art at the time (Abbott,

2020, p. 104). Since, except for in open-access cases, all algorithms might not be fully disclosed but may still be available, this would require a definition of how to compare their abilities. Furthermore, unless all documents, materials, and data in the world become publicly available, the capabilities of ML depend on the underlying algorithm as well as testing, training and input data. Thus, in this approach, there might appear a necessity to either: 1) impose an obligation to disclose the usage of ML and its credentials (Abbott, 2020, p. 102), although there is a criticism that such a requirement would not incentivize invention (Shemtov & Gabison, 2022, p. 431); 2) consider also incorporating a publicly available database where all ML algorithms along with sources of prior art they cover would be outlined; or 3) set a common standard of capabilities that applicable ML tools for searching the prior art have to comply with and examine all patent claims against it to determine obviousness.

It has to be outlined that just because more complex, advanced and resource-efficient (when built) solutions exist for the same technical problem does not mean that other solutions become obsolete. Namely, less complicated approaches claimed as such are evaluated towards the prior art of those particular techniques, not compared with more automated methods. Besides, building an ML algorithm could require more resources than finding a solution otherwise – for example, making a selection from many candidates using sheer luck (*Paper-making method/AVEBE*, 2005, para. 2.3).

2.2.3. Proposed Approaches

It has been suggested that the term “technologies used by active workers, including inventive AI,” could be used to define a person skilled in the art. “Inventive AI” would mean generating inventive outcomes while corresponding to conventional criteria of inventorship. Replacing the skilled person with inventive AI is suggested as a second step. Furthermore, the evaluation of inventiveness in the second case is suggested, as done primarily by AI: 1) defining the respective extent of the use of inventive technologies; 2) if inventive AI becomes a standard, describing inventive AI that would most precisely reflect the ordinary worker; and 3) determining if an invention would be found obvious by AI (most likely with assistance by experts) (Abbott, 2020, pp. 100, 102, 104–106).

It would require fundamental amendments to implement this proposal in the EPC framework. Firstly, the EPC does not recognize the concept of “inventive AI” because only humans can invent and recognize the inventive value of outcomes provided by applying AI (*Designation of inventor/DABUS*, 2021). Secondly, entirely abolishing the involvement of a human examiner would require revising the formulation of the criteria of the inventive step. Thirdly, the proposition implies that subjectivism (involving experts) is nonetheless necessary to achieve objectivism. Fourthly, criticism has been made towards the non-existence of any exceptions of fields where the method would not be deemed practical (Lee et al., 2021, p. 149).

Furthermore, an inventive step is also present when a creation goes in an opposite direction than technological progress (*Etching process*, 1986, para. 7). Besides, since the EPC excludes patentability for ML as such, for a creation involving ML, the “technical contribution” has to appear through the implementation or application of the claimed invention (EPO, n.d.-c, n.d.-d). Decisive in the framework of the EPC is not ML which is purely a tool for the automation of tasks or a mathematical method, but the resulting tangible or intangible invention. Additionally, a creation does not have to improve the prior art because alternatives to known devices or processes with identical or similar effects or that are more resource-effective are allowable (EPO, n.d.-f). Considering this, the striking factor is not whether the person skilled in the art *could* have, but whether they *would* have made an invention (EPO, n.d.-e).

Another approach that has been suggested is to examine inventions against the “obvious to try” approach based on the substantiality of their distinction from the prior art and the likelihood of success (Shemtov & Gabison, 2022, pp. 432–435). Additionally, the necessity of determining the version that the person skilled in the art would be deemed to use has to be determined. Simultaneously, there is also ambiguity towards the underlying incentives of inventors. Nevertheless, the proposal also outlines that in examining inventiveness the following aspects, amongst others, should also be evaluated: the need and substance of value judgements by the person skilled in the art, the level of research in the area, the expectancy of success, and the motivation to invent (whether obtaining a patent is the only inducement).

This proposition is more grounded. Nevertheless, the EPC has already incorporated the “would-could” standard under Article 56 that, together with the “problem-solution approach”, essentially corresponds to the “obvious to try” threshold (EPO BA T 1734/07, 2009, para. 3.3). At the same time, the proposal outlines its drawbacks. Additionally, there is criticism that the “obvious to try” standard renders the evaluation of obviousness even more ambiguous (Pendleton, 2022, p. 126).

It can be concluded that unless the respective amendments are made in the EPC or related acts,⁴ altering the perception of the notion of a person skilled in the art, the current legal stance addresses the present and the future application of ML as any other development of technology (*Äquivalenter Aortendruck/ARC SEIBERSDORF*, 2020, para. 3.6). Any legal adjustments to the framework of the EPC would need to be carefully evaluated since, as the analysis demonstrates, the consideration of ML as an ordinary tool for a person skilled in the art is interrelated with other criteria stipulated in Articles 52, 56, 83 and 84. Hence, the perception of a person skilled in the art of ML in all cases (Lee et al., 2021, pp. 136–151) might require fundamental changes in the EPC.

Issues with a person skilled in the art of applying ML in evaluating compliance with Article 56 of the EPC could be: 1) the concerns that it would impose significant barriers for obtaining a patent for those who would not opt for applying ML; 2) on the basis of the problem-solution approach developed under Article 54 of the EPC (its suitability for evaluation the future situation).

A part of the observed potential solutions to tackle the issue would require conceptual amendments to the framework of the EPC that the EPO might not support. One proposal aims to find a solution in the existing system but encounters difficulties. Nevertheless, it can be derived that the application of ML for searching a prior art would not make a subjective factor redundant. However, applying ML might require deciding on the perception of the yielded outcome in the context of the invention claimed later. Additionally, other alternations adjusting the standard of inventiveness to technological progress might require a decision as to whether to impose additional disclosure requirements in the application, determine a standard for applicable ML, or even develop a separate public database listing all applicable ML programs and their capabilities. Alternatively, all materials and data must be rendered publicly available, which may require some fundamental changes.

It should also be considered whether there would be an inducement for creators of ML to tolerate such widespread use if the patent reward was not an option. Namely, the EPC BA has decided that ML cannot be deemed and named as an inventor unless legal amendments are made (*Designation of inventor/DABUS*, 2021, 4.6.6). Nevertheless, there is an incentive to continue facilitating technological progress in creating ML if its role in the inventive process is recognized as demonstrated by both legal (Rudzite, 2022b) and economic (Kahn, 2022, pp. 385–398) aspects.

Some experts have suggested that due to the specifics of modern technology, including AI, and the shortcomings of existing IP regimes (including patents), a separate legal framework for them has to be implemented (Pendleton, 2022, pp. 131–132; Harison, 2008, p. 74). Thus, the concept of certification is proposed as a preliminary starting point for discussion.

3. Certification

3.1. The Rationale of Implementation

ML imposes numerous challenges for the EPC: 1) sufficiency of disclosure (Rudzite, 2022a); 2) inventorship (Rudzite, 2022b); 3) patent eligibility (Rudzite, 2023); and, as the analysis mentioned above demonstrates, also regarding the inventive step (European Commission Directorate-General, 2020, pp. 109–111). It is also suggested that there is an economic rationale to recognize the role of AI in the inventive process (Kahn, 2022, pp. 385–398). Additionally, there is a stance that recognition of the role of ML in the inventive process is more challenging for ML than for other fields regarding the patent framework (Iglesias et al., 2021, p. 22). Another reason for addressing the issues that ML encounters regarding compliance with the EPC is the alternative of opting for trade secret protection. This scenario presumably would cause a significant impact on technological development, non-

⁴ For instance, examination guidelines (European Commission Directorate-General, 2020, p. 111).

enrichment of common general knowledge and, consequently, economics if everyone would have to spend resources developing the desired item from scratch. A patent is said to be the key incentive in disseminating and developing new ML programs and providing their interoperability (European Parliament, [EP], 2020, para. 11).

Some of the outlined challenges might be addressed within the existing framework, such as via sufficiency of disclosure with minor (Rudzite, 2022a) or more considerable alterations (Rathi, 2020, p. 23). Simultaneously, others related to inventorship (Rudzite, 2022b; *Designation of inventor/DABUS*, 2021, 4.6.6) and patent eligibility (Rudzite, 2023) would require fundamental amendments to the framework of the EPC. Considering the abovementioned, a *sui generis* mechanism could be deemed to be preferred to overcome obstacles that ML comes across related to the framework of the EPC (Pendleton, 2022, pp. 131–132; Harison, 2008, p. 74; Rudzite, 2022a, 2022b). Moreover, there are proposals for the potential framework of such an alternative mechanism.

Evaluating various possible approaches and following existing regulations for semi-conductor chips suggests that the optimal solution could involve introducing a registration system of know-how that embodies software. This would facilitate keeping track of technological progress, enriching common general knowledge and rewarding disclosure. Others, by law, could obtain an automatic, compensated license to use the software once it has been registered. This approach would incentivize developers to favor the reuse of their product for reward. Various already drafted licenses could be incorporated, with the discretion to choose terms, limited public access or commercial use, and others that, to some extent, would parallel licensing mechanisms in the music industry. The protection is suggested for three years or less to provide time to root a niche in the respective market (Samuelson et al., 1994, pp. 2423, 2426–2429).

Considering their difference from traditional programming, a *sui generis* mechanism to address the specifics of ML could be preferred instead of adjusting the existing regimes. In this regard, for instance, certification similar to in the electricity market⁵ could be the chosen approach (Norvig, 2020).

Despite criticism towards seemingly unsuccessful *sui generis* semi-conductor and database regimes, the conclusion is that there is a crucial need for an autonomous protection mechanism for creations involving software (which also pertains to ML) due to its dual nature. Registration with the disclosure of source code is outlined. The mechanism could exist at the national and EU level in parallel with existing regimes (Picht & Thouvenin, 2022, pp. 15–17). This article builds on the mentioned proposals and develops them further. The introduction of a voluntary certification system is suggested (Rudzite, 2022b). The analysis of the suggested system is preliminary, and is not intended to be an all-embracing conceptualization of the proposed system. It instead serves as a starting point for a discussion to address problems within the context of the interaction between ML and patent law under the EPC.

3.2. A Preliminary Proposed Framework

3.2.1. The Concept of Certification

In essence, the certification process is not novel since numerous areas foresee the necessity of undergoing such a mechanism (Rudzite, 2022a, 2022b). The concept of a protection certificate is acknowledged in the IP framework, for instance, as with supplementary protection certificates for pharmaceutical and plant protection products (EP, 1996, 2009) or a certificate of patent grant (EPO, n.d.-b). The proposed framework considers them to avoid repetition, contradiction or posing unnecessary administrative burdens. The suggested certification is deemed to exist in parallel with already established mechanisms and includes autonomous terms and framework. The term *certification* has been chosen as most precisely describing the framework outlined further, and means the process that includes evaluation of correspondence with certain steps to obtain a protection certificate. Vice versa, the “certificate” attests to said conformity (achievement). “Certification” indicates an understanding that it is a separate process that has to be completed and complied with to obtain certain benefits. The concept also reflects that certification is parallel but lower in scope than the patent framework (*patent* from Latin means “to disclose”;

⁵ Certification in the electricity market is issued as an approval that a certain amount of electricity has been generated, is owned, and can be further sold or otherwise traded (Karakosta & Petropoulou, 2022, p. 2).

certification – “to make certain”). Nonetheless, the chosen terminology is provisional and could be altered accordingly if another term was deemed more appropriate.

3.2.2. The Role of Certification in the Framework of Intellectual Property – its Legislative Implementation and Enforcement

Certification, similar to utility models (which are not implemented by all countries; World Intellectual Property Organization, [WIPO], n.d.), is deemed to comprise “patent-like” protection (Rudzite, 2022a, 2022b; Picht & Thouvenin, 2022, pp. 10–11). *Sui generis* certification as an optimal protection mechanism for creations involving ML is chosen because, firstly, the EPC was developed to reward humans. On the contrary, due to the specifics of ML, it does not require equal efforts to conduct the respective processes (Kahn, 2022, p. 384).

Secondly, computer science, of which ML is a sub-field, develops rapidly, heavily relies on other respective works to save resources and facilitate the developmental process, and outperforms the period taken for patent examination (Samuelson, 1994, p. 2376). In this regard, the patent protection term of twenty years for creations involving ML, as foreseen by the EPC and society in general, is cumbersome because the technology might already become outdated before the patent examination has concluded. Besides, until the patent is granted, the creation avails only provisional protection. Hence, competitors can use incorporated ideas without risking patent infringement if the creation is used until the patent is obtained (Articles 64 and 67 of the EPC).

Additionally, after the patent is granted, technology might have already gone further, which may require developers to make necessary adjustments. Besides, consumers might have already opted for using more up-to-date technology. In this regard, the knowledge that granting a patent would reveal might not be seen as an enrichment. Thus, a granted patent may not truly reward both the creator and society. Therefore, shorter examination and protection terms for ML creations are required. Exceptions where a longer protection term is needed could include areas where the involved resources are considerable – for example, drug development and discovery, which might even exceed twenty years of development (Lalli et al., 2021). Although the involvement of ML as an additional step facilitates this process, it does not exclude additional necessities as a requirement for clinical trials, *ex post* funding (Feldmann & Bajorath, 2020, pp. 1–2), and others. Hence, protection under the EPC might be suitable and preferable for those applications.

Thirdly, certain aspects cannot be protected under the current scope of the EPC or any other existing IP regime (Rudzite, 2022b). Fourthly, IP regimes already encompass creations involving ML; thus, there is no legal substantiation to step outside the realm of IP and IP-like protection. Fifthly, it is crucial to avoid redundancy with the EPC framework.

Considering the abovementioned, it would not be practical to delegate the conducting of certification for the EPO due to legal and administrative aspects, but instead to trust the function of an autonomous body (Rudzite, 2023). Depending on the approach chosen for the legal implementation of certification (observed further), the autonomous body could be established centrally in the EU, for example, by the European Parliament and the Council. Alternatively, it could be selected by each EU Member State separately. The independent body would examine ML creations, issue a certificate and review appeals if submitted.

There are multiple approaches (solo or combined) for the legislative implementation of the certification system. Amongst others, firstly, the European Commission could initiate a proposal implementing the suggested certification considering that the so-called “AI-Act” (a sort of *sui generis* system), that also foresees an obligation to obtain certification for ML with a certain level of risk, is already under discussion (European Commission, [EC], 2021). The initiative forms part of the *ordre public* for ML (Rudzite & Kelli, 2021, pp. 404–405). Namely, if certification would have to be conducted for ML and the same ML application intended to be placed in the market in the EU. This would most likely also initially apply for the patent under the EPC since all Member States of the EU are parties of the EPC (EPO, 2022). In this regard, there might be a possibility that if certification due to high-risk ML was required and not completed or not passed, the exception to this situation under Article 53(a) might be triggered.

Additionally, the EU has already proposed enacting a harmonized EU-wide regime of utility models that was suspended due to a preference for EU patents (EC, n.d.). Regardless of the prior outcome of the mentioned suggestion, the proposal of the AI Act and the stance of the European Parliament (2020) demonstrates the initiative to address aspects related to ML, including IP protection. Furthermore, the EU already has Directive 2004/48/EC addressing enforcement aspects of IP, including utility models. The regime could be attributable to the proposed certification if it were recognized as industrial property rights. Thus, it would be resource-effective for institutions and creators if the certification mechanism under the AI Act and the certification proposed in this article could be combined (Rudzite, 2022a, 2022b).

Secondly, the World Intellectual Property Organization could initiate a discussion on recognizing the certification as industrial property rights. Thirdly, similar decentralized national implementation currently exists regarding utility models (WIPO, n.d.). A mechanism, even a decentralized one, could be considered necessary to combine in whole or in part with the certification included in the AI Act. Additionally, recognizing certification as industrial property could allow already transposed enforcement mechanisms to be applied.

Fourthly, there is a possibility of creating a completely autonomous centralized mechanism. This approach could trigger a discussion on substantiation, considering that utility models are decentralized. Nonetheless, the starting point for discussion regarding the enforcement mechanism in this scenario could be the approach already transposed nationally.

Fifthly, it is possible to widen the scope of utility models by incorporating certification for ML matters. On the one hand, this approach could require minor adjustments because certification is proposed as, *mutatis mutandis*, the framework of utility models. In this regard, the enforcement mechanism could also be applied without additional adjustments. However, since the suggested certification includes several aspects that the current utility models do not foresee, a combination of both might render the system of utility models more complex.

The initiative taken by the Council of Europe based on the necessity of protecting property rights, including IP, as stipulated in Article 1 of Protocol 1 of the Convention for the Protection of Human Rights and Fundamental Freedoms (Council of Europe, 1950), might not be a viable option. Namely, the further proposed mechanism suggests the recognition of the role of ML in the inventive process through the lens of the rights of society that corresponds to the mentioned convention. Nonetheless, the offered certification includes various procedural aspects that might not be preferred to be initiated by the Council of Europe since it ordinarily deals with substantial aspects.

The initiative by the EPO or even considering using the upcoming mechanism of the Agreement on a Unified Patent Court (2013) might not be an option. In other words, said approaches deal with patent matters, not with patent-like matters – at least not yet. Thus, imposing another duty on them might disrupt both the patent and patent-like systems; hence, not be preferred.

Regardless of the approach preferable, the implementation of certification will be the outcome of the political debate. Nevertheless, an alternative would be to opt for trade secret protection, conceptually altering the EPC, or choosing an open-source model. None of the mentioned routes could be favored over certification.

3.2.3. Rights Comprised

Since certification is deemed as being built on the approach of utility models, it would not be justifiable to grant fewer rights than the utility model applicant receives. Namely, certification would result in granting exclusive rights to the owner of the certified creation (a human or a legal entity as a holder of rights depending on the respective contractual relationship). This would allow for a limited period in the designated region to prevent, without authorization, the exploitation of the protected creation commercially if an applicant chooses protection fully or partially under certification. In other words, granting economic rights under certification to prevent overlap will be prohibited if the same protection already applies through other IP mechanisms (copyright and related rights, patent and others) (WIPO, n.d.). Authorization for users to use the protected creation would involve issuing a license (for free or a gratuity), the terms of which could be stated by the holder of the economic rights (Rudzite, 2022a, 2022b).

Certification would also recognize moral rights for a creator to be named individually or collectively as a co-contributor, unless protection was not already covered by other IP mechanisms (copyright and related rights, patents and others). The economic right would be transferable and alienable, similar to other respective patent-like rights. Furthermore, certification for the mentioned moral right holders would also allow them to choose whether it was necessary to recognize the role of ML in achieving the work (mentioned for transparency). This would relate to cases where the involvement of ML in said process would not be deemed to have been solely as a tool. Such recognition of the role of ML would not grant any right to ML per se but derive from the right of the respective humans to choose who should be named as one depending on the level of their involvement in the outcome (Rudzite, 2022b).

The respective rights will depend on the desired aim of certification. Firstly, one could choose certification as the only protection mechanism instead of, for instance, a patent. Protection by two mechanisms simultaneously would not be possible, to avoid overlap if the creation had already been covered by other IP mechanisms (copyright and related rights and others). In this case, as a result of certification, economic and moral rights (for a human) might be obtained (Lee, 2020, p. 15), and a role (for ML) recognized.

Secondly, the aim of certification could be not to obtain exclusive rights and recognition, but to seek a non-binding, impartial expert opinion for patent purposes. The substantiation of this is that persons heavily involved in creating or drafting a patent application for a particular invention might perceive some aspects as obvious and not disclose them in detail (Rudzite, 2022a). Thus, if necessary, certification would allow for verifying (in a confidential manner) and rapidly improving the written description deemed to be submitted for the EPO to ensure compliance with the requirements of Articles 83 and 84 of the EPC. This mechanism would be especially beneficial for sophisticated ML algorithms that are said to encounter the so-called “black box” aspect.

This approach will not require depositing the algorithm, training, testing and input data, and will allow for choosing the optimal limit of information to be disclosed to meet said criteria and not lose competitive advantage. Certification would serve as an expert opinion if needed, via a group of experts that the EPC accepts as capable of providing additional approval of the feasible reproducibility of the invention (Rudzite, 2022a). Additionally, the same mechanism could also serve the purposes of Article 56 of the EPC since a person skilled in the art of evaluating inventiveness has an equal level of ability for evaluating the sufficiency of disclosure (EPO, n.d.-i). In this case, neither economic rights would be granted nor moral rights recognized. Furthermore, this mechanism could also be used to evaluate the “technicality” (Article 52) of the invention in advance. This approach could also be used for future matters (verifying obviousness) if the usage of ML were to become widespread, as analyzed previously.

Thirdly, certification could offer protection in cases where other mechanisms would not guarantee the desired protection for certain features. For instance, it could be suitable for creations in areas that are not recognized as “technical” under the EPC. Certification would also suit creations that would be too technical for copyright protection but not technical enough for a patent under the EPC (such as program behavior or design, algorithms as embedded tools, and others). For the certified part, economic rights could be granted, and moral rights (for a human) and role (for ML) recognized if overlap with other granted IP rights did not exist (Rudzite, 2023).

Fourthly, registration might be sought only to recognize the role of ML in producing a creation without seeking to grant the protection of the economic rights of said solution. This approach would not overlap with nor impact other IP regimes since it would not alter any rights granted under them, but would exist in parallel in its framework. In this regard, this route would allow transparently informing others about the respective role of ML, hence, allowing ML to compete in its own “weight class” (Rudzite, 2022b).

Fifthly, certification could be chosen to evaluate the possibility of obtaining protection under the existing IP regimes (for instance, a patent under the EPC), as well as to determine what steps might need to be taken to achieve the desired result. Thus, if desired, certification would serve as an impartial, non-binding opinion of an expert for the purposes mentioned earlier for a patent under the EPC (Rudzite, 2022a). Said approach would not yield economic rights, nor the recognition of moral rights (for a human) or role (for ML).

An intrinsic part of certification would be disclosure to the public: 1) to deprive others of seeking protection (for instance, patent, Article 54 of the EPC) for the same creation (defensive publishing); 2) to inform others about the creation, thus enriching the public knowledge base; 3) to inform others about the role of ML in the respective process, hence providing economic stability towards the capacities of humans and ML; and 4) to allow for tracking technological progress, which could serve not only for a present purpose but also for the future. Namely, suppose the usage of ML becomes widespread. In that case, the certification record could serve as a basis for determining the state of the art of ML or act as a sort of register for evaluating obviousness, as mentioned previously (for further discussion, see Rudzite, 2022a, 2023).

The described disclosure would be implemented by registration in a public database like an information system where a record of issued certificates would be kept. The database would include a catalogue system similar to the EPC, with all the respective documentation. Additionally, said system would not have a repository or other deposit mechanism that, on the contrary, might have a negative impact (Rudzite, 2023). Depending on the aim of certification, the certificate would: 1) certify the granted economic rights due to the created work and their holder; 2) recognize moral rights (to whom, what); 3) outline the term of protection and area where protected; and 4) identify the protected object that could be viewed in detail in said database.

Based on the chosen purpose, the respective record would be made in the database following disclosure. Moreover: 1) to obtain economic rights (for a human or a legal entity) and the recognition of moral rights (for a human) and role (for ML), the entry would be made public; 2) for the purposes that certification serves as an impartial, non-binding opinion of an expert, the respective event would not be disclosed publicly to ensure a) the possibility to examine the application confidentially and b) the avoidance of the risk of losing novelty (Article 54); and 3) to achieve both aims the entry would initially not be made public, but if, as a result, the protection of certification was chosen, the record would be made public.

The term for protection would be differentiated depending on the aim of certification. For the recognition of moral rights (for a human; Lee, 2020, p. 15) or role (ML), certification would be indefinite since there is no rationale to limit the term. Furthermore, the incrementality of the creation and the role of ML in the respective process would determine the term of protection for economic rights. A multi-term approach would provide an optimal reward for the involved efforts and for the benefit of society (for further discussion, see Rudzite, 2023).

3.2.4. Evaluation Process

The examination could be based on the same aspects as for the patent under the EPC and utility models. Namely, the application for certification would be necessary, upon which novelty, achievement level regarding the distance from the prior art, disclosure and others would be verified before granting the certificate. The approach would avoid complications and allow the aim of issuing an opinion of an expert without systemic adjustments to be fulfilled. The level of compliance evaluation would be equally stringent with the EPC (for instance, for novelty, non-obviousness and industrial applicability (not incentivizing triviality)). In other aspects, it would be lifted (for the sufficiency of disclosure, it would be possible to fulfil the missing information during the examination). The stringency of the evaluation of achievement level would be differentiated depending on the incrementality of the creation and rewarded accordingly. The focal point of the evaluation would be the fulfilment of the material (technical) aspects. However, if opted for, compliance of *ordre public* and morality might be reviewed, especially for high-risk ML applications seeking patents and deemed to be placed in the market in the EU (Rudzite, 2022a; Rudzite & Kelli, 2021).

Examination would be expedient, similarly to utility models, to facilitate technological progress. It would be provided by creating an inspective “sandbox” with multiple experts from various fields, and would take less time than granting a patent under the EPC. Applicants or third persons could appeal the results of the examination with the respective body, after which it would then become final.

Conclusions

ML triggers challenges, not only regarding inventorship under the EPC, but also in other areas, such as sufficiency of disclosure, obviousness, patent eligibility, and economic stability towards the capacity of humans compared to ML. Due to technological developments, the future might bring more challenges once the usage of ML becomes routine, especially relating to obviousness.

Because of the specifics of ML, for this paradigm to become a reality as a new normal, all of its information, materials and data would have to be rendered publicly available, and ML algorithms would have to be equally capable. Alternatively, ML might become widely used, but underlying training, testing and input data might be kept secret. Thus, a technological divide would be present since ML algorithms processing more data would be more powerful than others.

In the first scenario, no hardships would exist in examining the obviousness of a claimed invention. However, in the second situation, for the purposes of examining obviousness, there would initially be a necessity to either: 1) enact a duty to disclose the application of ML and its capabilities; 2) consider creating a database available to the public where all ML algorithms and their underlying sources of prior art would be reflected; or 3) determine a standard that a person skilled in the art would be used regarding the capabilities that an ML algorithm has to comply with for searching the prior art and reviewing all patent claims towards it to conclude on obviousness.

Additionally, an agreement under the EPC is needed on how to treat the result that the ML algorithm would display when searching the prior art. Namely, a consensus would have to be made on ML algorithms that would be presumed as being used for the purposes of searching the prior art – simpler examples that perform routine tasks such as classification without additional input, or more sophisticated ones that perform connections at a profound level, such as deep neural networks. In other words, more complex ML algorithms might process raw data and convert them into information. A consensus would then be required on how to perceive the result displayed by ML (should it be seen as raw data, a discovery, or as part of the invention if it is obtained afterwards by applying the output). If the outcome reflected by ML is agreed to serve as a part of the invention, it would have to be disclosed according to EPC Articles 83 and 84, and vice versa. Common understanding by the EPO could help to overcome difficulties in examining obviousness.

Alternatively, approaches have been proposed to tackle future difficulties related to evaluating obviousness. However, these solutions encounter problems. Therefore, they are not supported. Considering the present and presumed future challenges that ML will come across in complying with the requirements of existing IP regimes, the *sui generis* approach might be preferred.

This article builds upon existing suggestions and develops them further, offering implementation and recognition of certification as additional areas of industrial property that, as a patent-like regime, would exist in parallel with the EPC and utility models. The article provides a detailed preliminary overview of the framework of the suggested mechanism.

Certification is offered as a voluntary patent-like protection mechanism similar to utility models. Certification primarily aims to provide optimal protection for creations involving ML in those aspects where the existing IP regimes stop. Ideally, certification could be recognized as industrial property rights, availing the respective benefits of the existing regimes regarding enforcement. Certification is provided as an addition to the current frameworks; thus, it would not substitute or repeat them. The suggested method of certification is framed dynamically, allowing adjustments for future technological development.

The suggested model would not require significant legal amendments but, favorably, would allow existing regimes to be built on. The *sui generis* system would allow the needs of technological progress to be addressed dynamically, facilitating the enrichment of knowledge, industrial development, and optimally rewarding creators. One alternative could involve fundamentally amending the EPC; another opting for trade secret protection, slowing technological progress or even rendering said creations open-source – neither of which might be preferred.

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