TALLINN UNIVERSITY OF TECHNOLOGY
School of Business and Governance
Department of Law

Regina Sedergren

THE IMPACT OF THE DEVELOPMENT OF ARTICIFIAL INTELLINGENCE IN INTELLECTUAL PROPERTY LAW IN THE EUROPEAN UNION

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Supervisor: Thomas Hoffman

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Regina Sedergren ……
(signature, date)
Student code: 183936HAJB
Student e-mail address: ansede@taltech.ee

Supervisor: Thomas Hoffman
The paper conforms to requirements in force

……
(signature, date)

Co-supervisor:
The paper conforms to requirements in force
……
(signature, date)

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ABSTRACT

Artificial intelligence (AI) technologies are developing rapidly in the modern world. The increasing of AI technologies requires updated legislation. This paper investigates the current state of the art of intellectual property (IP) law in the light of the development of AI technologies. The need for updated legislation in the field of IP law and AI is recognized. The main objective is on issues around copyright protection and the slow pace of legislators in the light of rapidly advancing technologies. Topical legislation is provided in addition to the EU framework concerning AI technologies. The paper investigates more specific issues with copyright legislation in different branches, such as artistic works now and in the future. Works created by AI independently without human input are investigated. The focus is on AI-operated technologies' impact on copyright law.

Keywords: AI, IP, copyright, technologies, robots, intelligence

INTRODUCTION

AI technologies are developing rapidly in the modern world. The impact of the development of AI is increasing and it has to be recognized. Artificial intelligence is often referred to as a combination of machine learning techniques, robotics, and algorithms in addition to automated decision-making systems.[1] AI systems have been developed since the early 1900s.[2] AI-operated technologies today produce content with economic value.[3] AI is already beneficial, and it is helping us to decode challenges in terms of healthcare, climate change, obstacles with traffic, and cybersecurity threats.[4] Europe is competitive from the AI prospect with investments. The European approach to artificial intelligence has been launched by European Commission to improve the benefits of AI and abolish the negatives.[5] AI has to be regulated to make it as beneficial as possible and simultaneously abolishing the worst scenarios. As of now, the amount of power given to AI-operated systems is up to companies developing the technologies and legislators trying to keep up with the evolution. The rights of intellectual machines have been under discussion and it provides an intriguing perspective on what the world could become with the help of intellectual technology. However, the negative aspects of rapidly evolving technology may raise fear and questions among legislators, as well as others. Furthermore, it is hard to legislate when the future, as well as many possibilities of AI, are still unknown. The European Union has taken a human-centric approach to the development of AI-operated technologies and drafted an ethical framework concerning the subject matter. Ensuring appropriate legal framework concerning AI and IP law, reflection is necessary on interactions between the two from the narrative of both intellectual property offices and users.[6]

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[1] Madiega, T. (2019). European Parliament. EU guidelines on ethics in artificial intelligence: Context and implementation. European Parliamentary Research Service. 23.3.2021

[2] Haney, B. S. (2020). Ai patents: data driven approach. Chicago-Kent Journal of Intellectual Property, 19(3), 407-484.

[3] Gervais, D, J. (2020) The Machine as Author, *105 Iowa Law Review*. 2053.

[4] Communication from the Commission to the European Parliament, European Council, the Council, the European Economic and Social Committee of the Regions, Brussels, 25.4.2018. Artificial Intelligence for Europe COM/2018/237. 10.3.2021.

[5] *Ibid.*

[6] *Ibid.*

The objective of the paper is to investigate the future of intellectual property law in the light of the development of AI. The research problem is rooted in the difficulties of creating efficient legislation in the area of IP law in detail concerning AI-operated technologies. A draft proposal clause on the copyright of AI-created works is produced to present a possibility for AI to be credited from its creations. The research begins by addressing the state of the art of intellectual property law concerning artificial intelligence in general and the protectability by legal means of the artistic creations of artificial intelligent operated machines. The paper discusses the legislation concerning AI and its possible future including an analysis based on legislation and academic articles concerning the subject matter. Additionally, the patentability of AI-operated organisms and their inventions are discussed in the light of the European Patent Convention and guidelines concerning the patentability criteria of AI, provided by the European Patent Office. The paper addresses the position of artistic works created by AI-operated technologies from the legal narrative. Furthermore, moral considerations concerning AI are briefly discussed. Eventually, the need for further and updated legislation in the field of intellectual property law is recognized concerning AI-operated systems. The state and future of EU legislation on intellectual property law, more specifically patent and copyright law are addressed in the light of academic literature. The analysis concerns the current state of the art of AI and IP law in the EU and discusses the benefits of AI as well the difficulties of creating efficient legislation in this particular field. In the conclusion, based on the research conducted, a draft proposal clause is presented on how AI-operated technologies would be able to gain benefit from their creations.

1. THE DEVELOPMENT OF AI TECHNOLOGIES

The use of AI has advanced significantly from performing simple tasks. Today AI finds solutions to complicated problems with speed prior unknown to humankind. The pace of the development of AI will have an enormous impact on almost every field of profession. The idea that humans would give machines access to the data to learn by themselves is most recent.[7] When machines learn and create by themselves, the question of whether they should have rights of their own arises. For instance, a humanoid, Sophia has been created by using AI and has been granted citizenship by Saudi Arabia.[8] The EU has started discussions regarding the ethical use and rights of humanoid robots in 2017. A form of "electronic personhood" was drafted to ensure the rights and responsibilities of capable Artificial Intelligence beings. The aforementioned is included in a set of regulations to govern the use and creation of robots and AI.[9] It will be significant, whether other countries' legislative systems recognize Sophia's citizenship or not. This will bring up the questions of ethics. Furthermore, it has been questioned whether Sophia's citizenship is a publicity stunt by the Saudi Arabian government.[10]

The concept that a machine has an ability for creative thought is a reality today. The cloning of human beings would not be any different than the creation of advanced artificial intelligence. Therefore, the question arises whether human creativity and artificial creativity should be treated differently.[11] Organizations such as Harvard and Uber have investigated the issue of bias concerning AI-operated machines.[12] For instance, racist facial recognition and sexist language processing have been recognized concerning AI systems.[13] Currently, AI-operated technologies

[7] Rocha, E. (2021). Sophia: Exploring the Ways AI May Change Intellectual Property Protections. *DePaul J. Art, Technology. & Intellectual. Property Law,* 126–128.
[8] *Ibid.*
[9] *Ibid*., 129.
[10] *Ibid*.,145–146.
[11] Davies, C. (2011). An evolutionary step in intellectual property rights – Artificial intelligence and intellectual property. *Computer law & security review 27*, 601-619.
[12] Violago, V., & Quevada, N. (2018). AI: The Issue of Bias. Managing Intellectual Property, 277, 32-36.
[13] Levendowski, A. (2018). How copyright law can fix artificial intelligence's implicit bias problem. *Washington Law Review, 93(2),* 579-630.

inter alia provide assistance and AI assistants are on the rise.[14] For instance, popular have become voice-based virtual assistants such as Apple's Siri and Amazon's Alexa. Those are created to perform tasks such as answering questions and playing music.[15]

1.2. AI in legal profession

The development of AI will impact the majority of professional fields and the legal profession is not an exception. Legal technology current subject matter concerning law firms. The role of a lawyer may change considerably in the future. Therefore, the knowledge of these technologies and aspects are significant considering the future of law as a field, law firms, and the role of a lawyer.[16] As well as many other jobs will be lost due to the development of technology, there are fears in the legal field can lawyers be replaced.[17] However, AI provides opportunities in the field of law such as avoiding errors and the possibility to be more specific.[18] The rapid development of AI may change the definition of legal personality in the future.[19]

[14] Curtis, L., & Platts, R. (2019). Alexa, What's the Impact of AI on Trademark Law. Managing Intellectual Property, 281, 43-47.
[15] Khatri, C., Venkatesh, A., Hedayatnia, B., Gabriel, R., Ram, A., & Prasad, R. (2018). Alexa Prize — State of the Art in Conversational AI. *AI Magazine*, *39*(3), 40-55.
[16] Semmler, S., & Rose, Z. (2017-2018). Artificial Intelligence: Application Today and Implications Tomorrow. Duke Law & Technology Review, 16, 85-99.
[17] Nelson, S. D., & Simek, J. W. (2017). Running with the machines: Ai in the practice of law. Law Practice, 43(4), 24-27.
[18] Fagan, F., & Levmore, S. (2019). The impact of artificial intelligence on rules, standards, and judicial discretion. Southern California Law Review, 93(1), 1-36.
[19] S. K., G. (2019). Can artificial intelligence machines be patented or sued. Court Uncourt, 6(6), 41-44.

2. EU LEGISLATION IN GENERAL CONCERNING AI AND IP LAW

European Parliament has published a resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies.[20] According to the resolution: *"The Union's legal framework for intellectual property aims to promote innovation, creation and access to knowledge and information… recent developments of AI and similar emerging technologies represent a significant technological advance that it is generating opportunities and challenges for Union citizens, businesses, public administrators, creators and the defense sector…"*[21]

Additionally, the aim of making the EU the world leader in AI technologies is addressed highlighting the efforts to safeguard the EU's digital and industrial sovereignty.[22] Discussing the legal status of AI in the EU, the EU resolution on robotics, European Parliament Resolution 2017 is significant. The resolution gives specific definitions of different types of AI use. It covers issues of liability, ethics, and additionally provides basic rules of conduct for developers, operators, and manufacturers in the field of robotics.[23] These are based on The Three Laws of Robotics by Isaac Asimov which are the following: *"A robot may not injure a human being or, through inaction, allow a human being come to harm. A robot must obey the orders given it by human beings except where such orders would conflict with the First law."*[24]

The European Union has put forward its aims to place Europe ahead of technological developments and encourage the uptake of AI by the public and private sectors, prepare for socio-economic changes brought by AI and ensure an appropriate ethical and legal framework.[25] At the moment, there is no universally accepted definition of AI. Definitions such as "computer-based

[20] European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies (2020/2015(INI)). 20.3.2021
[21] *Ibid*.
[22] *Ibid*.
[23] Atabekov A., Yastrebov, O. (2018) Legal Status of Artificial Intelligence Across Countries: Legislation on the Move. *European Research Studies Journal*, 773-782.
[24] Asimov, I. Handbook of Robotics, 56th Edition, 2058 A.D.
[25] European Commission. A European approach to Artificial Intelligence. 9.3.2021. 15.3.2021

systems that are developed to mimic human behavior" or a "discipline of computer science that is aimed at developing machines and systems that carry out tasks considered to require human intelligence, with limited or no human intervention" have been used to define AI.[26] The Executive Summary of the European Commission concerning trends and developments in artificial intelligence examines the state of the art of copyright and patent protection in Europe for AI-assisted outputs in general.[27] AI is used in pharmaceutical research where it finds patterns within large data sets and helps to automate the process, it assists in disease diagnosis, predictions of drug efficacy, and identification of drug characteristics. Additionally, AI is used in meteorology and in journalism. In journalism, AI enables automated aggregation, production, and distribution of content such as audio, image, or video. The main task of AI is to assist and support journalists in the creation of content.[28] Furthermore, a concept of robot journalism has been introduced referring to the automated production of news.[29]

2.2. EU Copyright and Patent legislation and AI

Historically, copyright has been seen as a tool dictating how artistic works can be reproduced and additionally will give the artist control over the work.[30] AI-operated systems are principally protected as trade secrets and difficulties arise when trying to find AI systems protection from copyright and patent laws.[31] EU copyright legislation has four criteria that are to be met for an AI-assisted output to qualify as a protected "work". The core issue under the Executive Summary is whether the AI-assisted output is the result of human creative choices that are "expressed" in the output. A challenge could arise be when authorship is falsely claimed in respect of AI creations.[32]

EU patent law requires that one or several human inventors must be identified in the patent application. Beyond this requirement, inventorship and co-ownership are a matter of national law. There are three possible claimants to an AI-assisted invention as regards ownership: the

[26] Hartmann, C., Allan, J., Hugenholtz, P., Quintas, J., Gervais., D. (2020). Trends and Developments in Artificial Intelligence. Challenges to the Intellectual Property Rights Framework. Executive Summary. 20.3.2021
[27] *Ibid*., 3.
[28] *Ibid*., 4.
[29] Díaz-Noci, J. (2020.) "Artificial Intelligence Systems-Aided News and Copyright: Assessing Legal Implications for Journalism Practices" *Future Internet* 12, no. 5: 85.
[30] Zeilinger, M. (2018.) Digital Art as 'Monetised Graphics': Enforcing Intellectual Property on the Blockchain. *Philosophy & Technology.* 31, 15–41.
[31] Foss-Solbrekk, K. (2021.) Three routes to protecting AI systems and their algorithms under IP law: The good, the bad and the ugly. *Journal of Intellectual Property Law & Practice*. 2021-02-18.
[32] Hartmann, C., Allan, J., Hugenholtz, P., Quintas, J., Gervais., D. (2020), *supra nota*, 8.

programmer or developer, the owner, and the authorized user of the system.[33] As long as there is no issue in establishing a sufficient connection between an AI-assisted invention and a patent applicant, there is no particular requirement for harmonization.[34] The patent application has to sufficiently disclose the invention. Artificial intelligence presents possible challenges to this requirement.[35] IP law is an area of law that has to be updated by the advancement of technology for it to be sufficient and cover the latest types of new inventions and technology. Definite legislation in the aforementioned area will help to avoid possible and costly lawsuits and conflicts.[36] The European Patent Office (EPO) updated official guidelines concerning patent eligibility of AI and machine learning technologies on 1. November 2018.[37]

2.3. Copyright protection of AI

The copyright legislation of the EU is a set of directives including the directive on the legal protection of computer programs ("Software Directive")[38] and the directive on the legal protection of databases ("Database Directive")[39]. Authorship is exclusively addressed in the aforementioned directives in addition to the Rental and Lending Rights Directive. EU legislation leaves the member states an excessive amount of freedom to define the author of a computer program or of a database. This leaves the member states the power to define whether the author should be a natural person, a group of natural persons, or a legal person.[40] AI-operated systems can be granted copyright protection which is available for the original software. Regardless, this only covers the original expression of the computer program, not the ideas behind it.[41] Therefore, only the expression of the computer program can obtain copyright protection meaning that the code of the algorithm can be protected while the concept behind the algorithm cannot.[42] The absence of a

[33] Ibid., 9.
[34] *Ibid*.
[35] *Ibid*.
[36] Davies, C. (2011), *supra nota*, 606.
[37] *Ibid*.
[38] Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs. (Codified version) (Text with EEA relevance) OJ L 111, 5.5.2009, 16–22
[39] Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases OJ L 77, 27.3.1996, 20–28
[40] Ramalho, A. (2017). Will robots rule the (artistic) world? A Proposed Model for the Legal Status of Creations by Artificial Intelligence. 16.3.2021
[41] Iglesias, M, Shamuilia, S, Anderberg, A. (2021). Intellectual Property and Artificial Intelligence. A literature review. Joint research center (JRC). 20.3.2021
[42] *Ibid*., 9.

human author remains the problem behind AI-created works obtaining independent copyright protection. In both EU and in the U.S works made entirely by code cannot be protected.[43]

2.4. Patentability of inventions generated by AI

It remains a question whether inventions created by AI should be granted patents and furthermore, should inventorship be awarded for such inventions created by AI. Article 52(1) of the EPC states that European patents can be granted for any inventions having an industrial application and additionally, are new and they involve an inventive step.[44] The EPC highlights that an application has to disclose the invention in a manner for it to be carried out by a "person skilled in that art" without defining the aforementioned. This could become an issue for machine-generated inventions. The aforementioned definition has been interpreted through case law in the past.[45] The question of inventorship is significant when concerning patentable inventions generated by AI. When the European legislation concerning patents does not provide a definition for inventorship, there however is a presumption that it belongs to "a natural person".[46] It has been however argued that AI systems should not have the same position in patent law as human inventors have.[47] Inventions made by AI-operated technologies are inevitably in the future and can become responsible for the majority of inventions.[48] In the U.S Copyright Office Practices work must be created by a "human being" to qualify as work of "authorship". Also, in Australia, an author is identified as a person.[49] As mentioned before, the European legislation provides an assumption that a natural person is the inventor and therefore would generally have the authorship of the work. Furthermore, different legislative systems share the view on the subject matter for now at least.

2.5. European Patent Office: guidelines for patentability of AI

European Patent Office (EPO) has released guidelines for patentability criteria of AI. Article 52 paragraph 1 lists patentable inventions and regards the main criteria for patents to be granted for

[43] Kop, M. (2020). Ai & intellectual property: Towards an articulated public domain. Texas Intellectual Property Law Journal, 28(3), 297-342.
[44] Iglesias, M, Shamuilia, S, Anderberg, A. (2021), *supra nota*, 16.
[45] *Ibid.* P.16
[46] *Ibid*.
[47] *Ibid*.
[48] Schuster, W. (2018). Artificial intelligence and patent ownership. Washington and Lee Law Review, 75(4), 1945-2004.
[49] Devarapalli, P. (2018). Machine Learning to Machine Owning: Redefining the Copyright Ownership from the perspective of Australian, US, UK and EU law. *European Intellectual Property Review*, 722-728.

any inventions, in all fields of technology, providing that they are new, involve an inventive step, and are open to industrial application.[50] Furthermore, the following are not regarded as inventions within the meaning of the aforementioned: discoveries, scientific theories and mathematical methods, aesthetic creations, schemes, rules, and methods for performing mental acts, playing games or doing business, and programs for the computer and presentations of information.[51] Therefore, the aforementioned are considered as exclusions from patentable inventions. Computer programs are an example of items excluded from patentability; however, this does not apply to computer programs having a technical character. "A further technical effect" is required to obtain a patent according to the EPO.[52] "A further technical effect" is considered as a technical effect that goes beyond the traditional physical interactions between the program and the computer where it is run. An example of further technical effects conferring technical character to a computer program is, for instance, the control of a technical process or of the internal functioning of the computer itself or its interfaces, according to the guidelines for patentability criteria released by EPO.[53]

[50] European Patent Office. The European Patent Convention. 20.3.2021
[51] *Ibid*.
[52] *Ibid*.
[53] *Ibid*.

3. AUTHORSHIP AND OWNERSHIP OF AI

The concept of authorship in copyright law is significant. Issues arising from AI and copyright law are current and are a topic under discussion.[54] Copyright protection can be secured when it results from human intellect. The standards of copyright protection are similar worldwide, there are multiple copyright treaties to support this.[55] Type of artificial intelligence, machine learning, enables machines to learn from experience independently. The main questions concerning this matter of subject are, who owns the rights over intelligent machine created works and how this should be regulated.[56] Artificial intelligence has given us self-driving cars, functional web search, and, for instance, practical speech recognition.[57] The ownership of AI is recognized differently by different countries and their legal systems. Countries have different approaches on how they identify an author or owner of specific creative work and provides copyright protection if the work is eligible. In circumstances, where the human role disappears from the creation of an invention, claiming the human as an inventor can become misleading.[58]

The following will present a short comparative analysis on copyright ownership in different legislative systems. The Copyright Act 1068 in Australia provides that "the author of a literary, dramatic, musical or artistic work is the owner of any copyright subsisting in the work." [59] It is also provided in the same regulation that an "author" of an artwork has to be "a person".[60] Furthermore, the U.S provides protection to computer programs but however denies protection from the works independently created by AI-operated technologies. The U.S. Copyright Office Practices states that it will not register works produced by machine without "creative input or intervention from a human author".[61] In the EU however, as mentioned earlier, copyright issues

[54] Bond, T., Blair, S. (2019.) Artificial Intelligence & copyright: Section 9(3) or authorship without an author, *Journal of Intellectual Property Law & Practice*, Volume 14, Issue 6, June 2019, 423.
[55] Ruipérez, C., Gutiérrez, E., Puente, C., & Olivas, J. A. (2017). New Challenges of Copyright Authorship in AI. In *Proceedings on the International Conference on Artificial Intelligence (ICAI)*, 291-296.
[56] Devarapalli, P. (2018), *supra nota,* 1.
[57] *Ibid*.
[58] Lim, D. (2018). Ai & ip: Innovation creativity in an age of accelerated change. *Akron Law Review, 52(3),* 813-876.
[59] Copyright Act 1968 (AU) s 35 (2).
[60] Devarapalli, P. (2018), *supra nota,* 5.
[61] *Ibid*., 6.

are addressed in several directives. EU legislation permits member states to define the authorship aspects. In conclusion, the majority of the jurisdictions require human intervention or input to become an author or an owner of copyrightable creative work.[62]

3.1. EU legislation on copyright authorship

Time is significant in IP law.[63] The President of the Australian Computer Society, Anthony Wong has suggested that the EU's initiative can prospectively allow AI-operated machines to obtain ownership for their own creations in addition to being liable for the damage they might cause.[64] The copyright authorship is addressed in the Software Directive, the Term Directive, and the Database Directive. Article 2(1)[65] of the Software Directive and Article 4(1)[66] of the Database Directive gives member states the permission to define the authorship aspects of a computer program or of a database as either the natural person or group of natural persons that created it or the legal person defined as a right holder under national laws. The majority of countries view human as an author or an owner of creative work that can have copyright protection because of the belief that there is a need for human creative input.[67] Different case decisions by the CJEU provide that creative artwork has to fulfill specific fundamental requirements to fit the qualification for copyright protection, the creation has to be classified as protected by the legislation.[68]

EU Database Directive 96/9/EC states within Art 3(1) that "*databases which, by reason of the selection or arrangement of their contents, constitute the author's own intellectual creation shall be protected as such by copyright*".[69] In the light of the aforementioned, the author of a work has to meet the ordinary originality test confirming that the work is not copied, and it comes from the author. Similarly, the author of a database has to provide some intellectual creativity.[70] To match

[62] *Ibid.*
[63] Oliar, D., & Stern, J. Y. (2019). Right on time: First possession in property and intellectual property. Boston University Law Review, 99(2), 395-458.
[64] Devarapalli, P. (2018), *supra nota,* 5.
[65] Directive on Legal protection of computer programs 2009/24/EC of the European Parliament Article 2(1).
[66] Directive on Legal protection of databases 1996/9/EC of the European Parliament Article 4(1).
[67] Devarapalli, P. (2018), *supra nota,* 9.
[68] *Ibid*.
[69] Directive on Legal protection of databases 1996/9/EC of the European Parliament Article 3(1).
[70] Devarapalli, P. (2018), *supra nota,* 9.

the originality requirement of the EU, the level of originality reached by the machine in the light of the copyright or database protection, is important to be determined.[71]

3.2. Legal personality and AI

The question of legal personality appears when considering AI. One point of view is the position of slavery when a human-made AI-operated machine would be seen more than as a property.[72] AI as property is used as a tool for humans to achieve something. Therefore, it provides assistance.[73] AI becoming more autonomous will bring obstacles around different subject matters such as copyright ownership concerning for instance artistic works created by AI-operated technologies.[74] However, this is another subject but should be regarded.

[71] *Ibid*.
[72] Sen, S., & Solmaz Bilici, M. (2020). Protection of Artificial Intelligence Products under the Law on Intellectual and Artistic Work. *GSI Articletter*, 23, 128-141.
[73] Hristov, K. (2017). Artificial intelligence and the copyright dilemma. IDEA: *The Journal of the Franklin Pierce Center for Intellectual Property*, 57(3), 431-454.
[74] Brown, D, R. (2021). Property ownership and the legal personhood of artificial intelligence. *Information & Communications Technology Law*, 30:2, 208-234.

4. AI AND ARTISTIC WORKS

Art has been created by using computer programs for several years now. AI is used as a tool in the creation of art. The idea that AI is only a tool, artists use to create art can be challenged. In circumstances where there are art-generating algorithms, it can be considered as more than just a tool. AI can learn from data and can make decisions based on past experiences.[75] Generally, art would be considered a creative work of the human intellect. However, today human element is not necessarily considered an invaluable aspect of creative work anymore.[76] When is the artist using AI to create as a tool and when the AI becomes the artist itself? When the art-generating algorithm creates the artwork completely by itself without any human connection, is this when the AI can be considered as the artist? Should in these circumstances the AI have rights to the artwork in the future? Or is does the ownership of the artwork fall on the owner of the AI or, for instance, the programmer of the algorithm? The aforementioned questions remain still unanswered. The development of AI has led to a discussion on the benefits concerning artistic and scientific works created by AI-operated technologies.[77] Art and machine intelligence have a complex and evolving relationship. Machine intelligence brings new possibilities in the creation of artwork.[78] The speed of the development of technology has reached a level that is unknown in the past. This inevitably has an impact on how AI is viewed in connection with art and how its advancement affects the concept of artwork in the future. Furthermore, this will have an impact on the legislation providing protection for artworks. The advancement of technology, more specifically AI, will require updated legislation on the field of IP law, to keep up with the pace.

Human intellect is usually connected to the concept of creation.[79] Artificial intelligence systems today create challenges the aforementioned. AI systems have been authors of books, have created stories, artwork in the form of paintings, music, drawings, and so on. AI has had an impact on the

[75] Mazzone, M, Elgammal, A. (2019). Art, Creativity, and the Potential of Artificial Intelligence. Arts, 8, 26.
[76] Manuel, J., Zatarain, N. (2017) The role of automated technology in the creation of copyright works: the challenges of artificial intelligence, *International Review of Law, Computers & Technology*, 31:1, 91-104.
[77] Gudkov, A. (2020) Robot on the shoulders of humans. *Journal of World Intellectual Property*. 2020; 23: 759– 776.
[78] Agüera y Arcas, B. (2017). Art in the Age of Machine Intelligence. *Arts*, 6, 18.
[79] Ramalho, A. (2017), *supra nota,* 2.

distribution of music in addition to its creation.[80] These and other subject matters can in due course come under copyright protection.[81] Additionally, there are real-life examples of how AI is helped humans to produce valuable artwork. For example, a painting called Edmund de Belamy was produced with the help of a machine learning algorithm, and the painting eventually sold at an auction where it was marketed as "the first portrait generated by an algorithm to come up for auction".[82]

The scope of what AI can do and create seems wide. AI creators of literary and artistic works question the conditions of authorship and legal protection as those are known today.[83] The definition of creativity is important when concerning artistic works generated by AI systems. For AI to be creative it has to produce new solutions that are not a reflection of previous solutions the AI has knowledge of.[84] The Resolution of the European Parliament identifies the ability to self-learn from experience and by interaction as an optional criterion in the definition of "smart robot".[85] Furthermore, it has been found, through experiments with AI painters, that paintings created by AI systems are influenced by the sounds in their surroundings, as well as the visuals of its ongoing painting, or even keywords that it independently selects.[86] Another concept, that has been under dispute is whether awareness and experience should become consciousness as we humans know it, to define creativity, in connection with the idea that AI is aware of its abilities to be creative and experience in the same way a human would be.[87]

In the EU, the Software Directive, the Database Directive, and the Rental and Lending Rights Directive address authorship. The original Proposal for Software Directive did not include the possibility for a legal person to become an author. The authorship was more seen as implying a human being. According to Recital 16 of the Term of Protection Directive, a specific artwork will be its author's own creation in circumstances where it reflects his personality.[88] Furthermore, The Court of Justice of the European Union (CJEU) has interpreted the statement "author's own

[80] Sturm, B, L.T.; Iglesias, M; Ben-Tal, O; Miron, M; Gómez, E. (2019) "Artificial Intelligence and Music: Open Questions of Copyright Law and Engineering Praxis" *Arts* 8, no. 3: 115.
[81] *Ibid*.
[82] Epstein, Z., Levine, S., Rand, D, G., Rahwan, I. (2020) Who Gets Credit for AI-Generated Art? *iScience*, Vol 23, Issue 9, Article 101515.
[83] Ramalho, A. (2017), *supra nota,* 4.
[84] *Ibid*.
[85] *Ibid*.
[86] *Ibid*.
[87] *Ibid*.
[88] *Ibid*., 7.

intellectual creation" to have the meaning that the author can make free and creative choices.[89] Additionally, attitudes towards AI-generated demerge, for instance, in the U.S attitudes are more critical towards AI-generated works in comparison to human-generated works, when in China AI-generated works receive a more positive reception.[90]

[89] *Ibid*., 8.
[90] Wu, Y., Mou, Y., Li, Z., Xu, K. (2019). Investigating American and Chinese Subjects' Explicit and Implicit Perceptions of AI-Generated Artistic Work. *Computers in Human Behavior.* 104.

5. CASE LAW AND RELEVANT LEGISLATION ON COPYRIGHT

The following will present an example of copyright debate where a selfie took by a monkey via camera independently became a subject of a published book. In the case, Naruto v. Slater, a monkey named Naruto photographed himself independently without human input with a camera. A complaint was filed by the People for the Ethical Treatment of Animals (PETA) against the defendant David John Slater who has published the pictures. Furthermore, the defendant's motion to dismiss has been granted because Naruto, as an animal, is not able to make claims and does not have standing.[91] This could be seen as a real-life example of a situation where rights cannot be granted to a subject that is not considered able to have a standing in court and make claims. If AI-operated technologies would be granted independent copyright protection, this would logically mean they would have to be able to support their case in court. This is not the case today. However, it cannot be ruled out for the future when technologies and legislation evolve. Judgement of this case provides an overview of copyright legislation and the policy different legislative systems have taken on that subject matter. However, in the settlement of the monkey case, Slater agreed to donate 25 percent of future gross revenue he gains from selling or using the monkey selfies to registered charities protecting the welfare or habitat of macaques in Indonesia.[92]

The Berne Convention for the Protection of Literary and Artistic Works deals with the protection of works and the rights of the authors. The three basic principles are the following: "*(a) Works originating in one of the Contracting States (that is, works the author of which is a national of such a State or works first published in such a State) must be given the same protection in each of the other Contracting States as the latter grants to the works of its own nationals (principle of "national treatment") (b) Protection must not be conditional upon compliance with any formality (principle of "automatic" protection). (c) Protection is independent of the existence of protection in the country of origin of the work (principle of "independence" of protection). If, however, a*

[91] *Naruto v. Slater*, Case No. 15-cv-04324-WHO (N.D. Cal. Jan. 28, 2016)
[92] Peta. (2017) PETA Statement: 'Monkey Selfie' Case Settled. 11.5.2021

Contracting State provides for a longer term of protection than the minimum prescribed by the Convention and the work ceases to be protected in the country of origin, protection may be denied once protection in the country of origin ceases."[93]

The aforementioned Berne Convention is significant when concerning copyright law in the light of AI-operated technologies and artistic works. By comparing different legislative systems, principles, and case law the general view is clear, AI technologies do not, at least yet, have independent copyright protection. However, some leeway is left for national legislation, for instance, when looking at the situation from the EU perspective. EU legislation does not have a specific copyright code as mentioned earlier. However, copyright law is coded in several directives.

[93] WIPO. Summary of the Berne Convention for the Protection of Literary and Artistic Works (1886). 8.5.2021

6. FUTURE OF LEGISLATION CONCERNING AI

Throughout the last decades, the development of AI-operated technologies has been significant, and its societal impact has increased.[94] The Court of Justice of the EU (CJEU) has established that copyright only applies to works that reflect the author's own intellectual creation, in the case of Infopaq International A/S v Danske Dagbaldes Forening.[95] The Legal Affairs Committee of the EU Parliament has concluded a study on European Civil Law Rules of Robotics that is discussed more precisely later on in this paper. The aforementioned study has recommended the adjusting of copyright from the perspective of autonomous robots' new and future abilities. This recommendation stipulates further criteria for "own intellectual creation" for works that fall under protection produced by computers or robots.[96] The aforementioned is going forward updated legislation concerning copyright law considering AI in the EU.

The copyright legislation cannot follow the speed of the development of AI-operated systems fast enough. This always leaves a sort of grey, unknown area to some aspects. This usually has a negative effect. As the article Computer creativity: artificial intelligence and copyright addresses, the future updated copyright legislation has to be able to find a balance between the interests of programmers of technology while safeguarding those, who do not use computer-generated creation.[97]

[94] Sartor, G., Lagioia, F., Contissa, G. (2020) The Use of Copyrighted Works by AI Systems: Art Works in the Data Mill. *European journal of risk regulation*. 2020-03, Vol.11 (1), 51-69.
[95] Court decision, 16.7.2009, Infopaq International A/S v Danske Dagblades Forening, Case C-5/08, ECLI:EU:C:2009:465.
[96] Ihalainen, J. (2018). Computer creativity: artificial intelligence and copyright. *Journal of Intellectual Property Law & Practice.* Vol. 13, No. 9.
[97] *Ibid*., 728.

7. MORAL CONSIDERATIONS OF AI

AI technologies can be extremely beneficial from economic and social perspectives. AI-operated systems are already used in numerous areas such as healthcare and transport.[98] The impact of AI is increasing in our daily lives. According to the briefing of the European Parliament's EU guidelines on ethics in artificial intelligence: Context and implementation the development and impact of AI are so wide that it could be sometimes considered as the fourth industrial revolution.[99] The legislators and policymakers are looking for ways to prevent and fight the possible dangers associated with the rapid development of AI. Therefore, the EU established a framework on ethical rules for AI. In January 2017 European Parliament called on the European Commission to evaluate the influence of AI and provided recommendations on civil law rules on robotics. Additionally, the European Parliament has drafted a code of ethics for robotics engineers.[100]

The copyrights of the content generated by AI technologies are a current subject of discussion in the legal sense. In addition to the discussion of the economic effect of AI, moral rights have also been under discussion.[101] The debate on copyright and AI mainly concerns to what extent human input is required in the case of copyrightable works.[102] This comes back to the question of programmer's rights since the programmer is the one with the creative input. The "black box" of AI is the concept where AI-operated technologies have created something without the developer's input.[103] Under the Berne Convention, there is no definition of the concept of "authorship". Furthermore, the general view is that it refers to human creators instead of AI-operated technologies as creators.[104] EU has directives that lay out the scope of copyright but not specific copyright code when the U.S provides copyright protection to "original works of authorship".[105]

[98] Madiega, T. (2019). European Parliament. EU guidelines on ethics in artificial intelligence: Context and implementation. European Parliamentary Research Service. 23.3.2021
[99] *Ibid.,* 2.
[100] *Ibid*.
[101] Miernicki, M., Ng (Huang Ying), I. (2021) Artificial intelligence and moral rights. *AI & Soc* 36, 319–329
[102] *Ibid*., 321.
[103] *Ibid*., 322.
[104] *Ibid*., 321.
[105] *Ibid.*

The difference becomes relevant in the following scenario: when the programmer creates AI, he holds the rights to it but when AI creates something completely different and distinguishable from the programmer's creative input. The lack of connection between the creator of the AI-operated technology and the content produced by the AI.[106] As has been discussed in academic literature, this could take a step further. The new technology created by the AI without any human input could produce new content without connection to the originally programmed AI.[107] The question of moral rights is inevitable when AI-operated technologies are used as a tool to help humans with their vision, then moral rights should be granted to the person exploiting AI for his own purposes. It is said that however, the programmer has provided the foundations for generations of content by creating AI, it is still not enough to justify moral rights protection.[108] Therefore, as it is now, AI-operated technologies should not be assigned moral rights of their own. The existing legislation supports the aforementioned. If the subject matter of moral rights arises in the future, the question should be detailed what kind of moral rights AI should obtain.[109]

[106] *Ibid.,* 324.
[107] *Ibid.*
[108] *Ibid.*
[109] *Ibid*., 326.

8. ANALYSIS

The impact of AI is increasingly affecting our everyday lives in a significant way that will affect numerous fields of professions. Without effective and precise legislation concerning AI-operated systems, the negative side of the rapid development of technology can outweigh the positive. The speed of the development of AI technologies is however very well recognized today. The main challenge with the aforementioned is the slow pace of law. Legislators are not able to keep up with the rapid development of technology and this will inevitably have an impact on society. Potential grey areas around intellectual property law in the EU and nationally concerning AI are to be recognized. Furthermore, the assessment of intellectual property legislation is necessary due to the development of AI in creative areas. AI-operated systems are becoming more advanced and can create, for instance, artistic works without human input. This brings up questions of intellectual property law on areas such as copyright protection. This will be approached in the light of what would it actually mean that AI-operated technologies would be granted some copyright protection. The aforementioned idea of AI technologies gaining independent copyright protection would require updated legislation. When AI-operated technologies would be granted such rights the limits of the copyright protection should be made clear in the wording of the legislation. As mentioned earlier, the current EU legislation on the field of IP is harmonized but still, some leeway is left for member states. When AI-operated technology created by a programmer, creates something without any human input and obtains copyright protection, and that creation of the aforementioned AI creates something without the input of the original AI, the question is who owns the rights to that creation.[110]

In circumstances, where new legislation concerning IP would be drafted in the EU, it would most likely require changes to national legislative systems of member states before implementation. Where national legislations have had the freedom to regulate the area of copyright, the national legislative systems would have to be modified to be in accordance with the updated legislation. A new proposal for updated legislation would be anticipated since the technology is developing

[110] Miernicki, M., Ng (Huang Ying), I. (2021), *supra nota,* 323.

rapidly and eventually the current legislation will be outdated. The criteria and basic principles for AI-operated technology to obtain copyright protection should be detailed in the wording of the new clause. The need for professionals in the field of technology and in the field of law will be invaluable now and in the future. When the human input is completely abolished from the creation of an artistic work, the question of whether claiming the human as an author of that specific work would become misleading. In order to avoid this issue, updated legislation should include the criteria for AI to obtain copyright protection. It should be differentiated where the work of the human has ended and where the work of an AI-operated technology has started independently when figuring out whether this protection should be granted or not. In the future, more professionals in both fields, technology and law, should be included in the process of drafting this updated legislation on the area of IP in the EU in addition to other legislative systems in the world. New legislation concerning the subject matter should be implemented in order to have answers to these questions that arise from the grey area the development of technology has created.

The need for updated legislation is recognized. The following will present basic guidelines for draft proposal clause concerning the subject matter. The proposal clause will be presented in the conclusion. Here, the clause would add to already existing copyright legislation an aspect concerning AI copyright protection for AI created works, which would not be identical with the general copyright protection humans can obtain. As the case Naruto v. Slater presented in its settlement, a percentage of the revenue gained from the use of the monkey selfie would be donated to the protection of wildlife.[111] In the case of AI, similar approach could be adapted. A percentage of the revenue gained by independent AI system would be invested in the AI creating the work with economic value. Additionally, the AI's name should be credited in the in work. Therefore, the human with the ownership of the AI would be the one with the obligation to credit the AI for the work. Furthermore, this would create an obligation for the person who has the ownership of the AI to invest in the development of AI a percentage of the revenue gained from its creations. More detailed description of the clause will be presented in the conclusion. The proposal strictly focuses on the obligation human with the legal ownership of the AI would have to the AI in circumstances where the AI creates works with economic value. Additionally, the ethical perspective has to be discussed in the light of granting copyright protection to AI-operated technologies. However, here the proposed clause would not grant AI-operated machines rights but an obligation for the human owner of the AI.

[111] Peta. (2017), *supra nota.*

CONCLUSION

The rapid development of AI-operated technologies will require updated legislation to provide legal certainty to all parties in the future. The impact of AI technologies is a current matter which has been under discussion in the EU and elsewhere in the world. The development of technology creates a grey area that can result in negative outcomes if not regulated sufficiently. The investigation of the state of the art of IP law and AI provides that issues are recognized and discussed, but the unpredictability of the development of technology makes the legislative process difficult. Since the development of technology is already widely impacting different fields of professions and everyday life, detailed legislation is significant. This research focus is mainly on copyright law concerning works created by AI-operated technologies. Additionally, the patentability of the creations of AI-operated technologies is discussed in the light of the European Patent Convention and guidelines concerning the patentability criteria of AI, provided by EPO. The main problems are rooted in the difficulties of keeping pace with the development of technology and AI-operated technologies. Therefore, it should be highlighted how it is for professionals in the field of technology to be included in the actual lawmaking process. The aforementioned professionals would be the best to foresee where the next step in the development of technology will lead. Based on the research conducted in this thesis, the following measures should be taken at the EU level to provide legal certainty to all parties involved for the use of AI-generated creative works.

My proposal in finding a solution for the aforementioned issues would be a new clause on copyright law in the EU concerning AI technologies. Currently, the EU gives its member states an amount of freedom to decide the author of the work. A new clause on legislation would promote the harmonization of this field of law concerning the creations of AI-operated technologies at the EU level. Reforming legislation EU level would require member states to amend their national legislative systems which would result in more harmonized copyright law in the EU concerning the creations of AI-operated technologies. My proposal would be to draft a clause including basic principles and criteria for obtaining copyright protection concerning the creations of AI. From the perspective of the current legislation, copyright protection has been seen as something only human

authors can be granted. In circumstances, where AI-operated technologies would be granted more independent copyright protection, it should be determined what kind of protection it would provide. In circumstances, where AI would be granted independent copyright protection and the work fulfills the already existing criteria such as originality etc, the clause should provide an overview of how the AI should be credited from the work. Additionally, whether that protection would be identical to the copyright protection humans can obtain, should be detailed in the wording of the updated legislation.

The following will present the proposed draft clause: The objective of this clause is to set the principles and criteria of copyright protection for the creations of AI. Here, the works protected are literary and artistic works generated by AI without human input. 1. To obtain copyright protection for creations of AI-operated technologies, the current criteria for obtaining copyright protection have to be fulfilled, e.g., the originality criteria. 2. To define when the copyright protection of the AI begins the human input should be completely abolished from the creation of the work. 3. The copyright protection granted to an AI-operated technology will subsist for 100 years. 4. The copyright protection would command 20 percent of the gross revenue gained from the works to be invested in the development of that AI for the purposes it is used. 4.1. The investment will be made by the human possessing the ownership of the AI with the objective to develop the AI for the purposes it was originally created. 5. AI obtaining the aforementioned form of copyright protection will be credited similarly from the work than the human behind the AI would. 6. The application is restricted to the works created by AI-operated technologies without human input.

Therefore, the aforementioned would not grant rights to an AI but an obligation for the human with the ownership of the AI to credit the AI for the work and invest 20 percent of the revenue gained from the creation of the AI to the AI. Here, the human would not be taking full credit from the AI of its creations, but at the same time, AI would not be granted autonomous rights under the law. AI as an author of the book would be an example of section 5. where AI would be granted similar credit than a human would. Here, the AI would be named as the author of the literary work. Additionally, 20 percent of the revenue gained from the sales of the book will be invested back to the AI. In this case, the objective of the investment is to develop the AI for the purpose to create more books. Therefore, the clause would provide credit to the AI and additionally abolish situations, where humans would claim full credit from completely independent work of an AI-operated technology. Furthermore, the clause would be a step towards the idea that AI could be

granted some credit in the first place. Whether AI-operated technologies can obtain independent rights comparable to humans will be a serious matter in the future. The rapid development of technology will outdate new legislation easily if different possibilities and scenarios are not taken into consideration in the beginning. Professionals in the field of technology, especially AI-operated technologies, should be heard in the process of creating new legislation in different fields of law concerning the development of technology in the future.

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