THE IMPACT OF DEVELOPMENTS IN ARTIFICIAL INTELLIGENCE ON COPYRIGHT AND OTHER INTELLECTUAL PROPERTY LAWS

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ABSTRACT

Objective: The objective of this study is to investigate the impact of AI breakthroughs on copyright and challenges faced by intellectual property legal protection systems. Specifically, the study aims to analyze the implications of AI-generated works in the context of copyright law in Indonesia.

Method: The research employs a normative legal approach, utilizing secondary data sources including books, legal journals, research findings, and statutory regulatory documents. The study focuses on relevant legal frameworks, such as Law No. 28 of 2014 governing copyright in Indonesia. The analysis is based on existing literature and legal documents to understand the current state of AI-generated works and their eligibility for copyright protection.

Result: The research findings reveal that according to Law Number 28 of 2014 in Indonesia, AI-generated works do not meet the originality standards required for copyright protection. However, users of AI-generated works are still bound by the terms and conditions set by the AI platform, which can limit their rights to the work. The impact of AI developments on copyright law includes challenges related to determining creators and copyright holders, redefining the concept of originality, increased instances of copyright infringement, issues concerning moral and personality rights, and collaborations involving both humans and AI. Additionally, challenges related to database protection and patent protection in the context of AI are also highlighted.

Conclusion: In conclusion, the advancement of AI technology introduces complexities in intellectual property law. The existing legal frameworks, such as copyright laws, need further adaptation and clarification to effectively regulate AI-generated works in the digital era. Addressing issues related to originality, creatorship, and collaborative works involving AI requires careful consideration and legal adjustments. Additionally, challenges related to database and patent protection in the realm of AI need to be addressed to ensure comprehensive intellectual property protection in the face of evolving technologies. Legal adaptation and clarification are crucial to navigating the intricate intersection of AI and intellectual property law.

Keywords: artificial intelligence (AI), copyright, intellectual property rights (IPR), intellectual property law, patent.

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O IMPACTO DOS DESENVOLVIMENTOS NA INTELIGÊNCIA ARTIFICIAL SOBRE DIREITOS AUTORAIS E OUTRAS LEIS DE PROPRIEDADE INTELECTUAL

RESUMO

Objetivo: O objetivo deste estudo é investigar o impacto dos avanços da IA sobre os direitos autoraís e os desafios enfrentados pelos sistemas de proteção jurídica de propriedade intelectual. Especificamente, o estudo visa analisar as implicações de obras geradas por IA no contexto da lei de direitos autoraís na Indonésia.

Método: A pesquisa emprega uma abordagem legal normativa, utilizando fontes de dados secundárias, incluindo livros, revistas legais, descobertas de pesquisa e documentos regulatórios estatutários. O estudo se concentra em quadros legais relevantes, como a Lei nº 28 de 2014 que regula os direitos autoraís na Indonésia. A análise é baseada na literatura existente e documentos legais para entender o estado atual das obras geradas pela IA e sua elegibilidade para a proteção de direitos autoraís.

Resultado: Os resultados da pesquisa revelam que, de acordo com a Lei número 28 de 2014 na Indonésia, as obras geradas por IA não atendem aos padrões de originalidade exigidos para a proteção de direitos autoraís. No entanto, os utilizadores de obras geradas por IA ainda estão vinculados pelos termos e condições estabelecidos pela plataforma de IA, o que pode limitar os seus direitos ao trabalho. O impacto dos desenvolvimentos da IA na lei de direitos autoraís inclui desafios relacionados à determinação de criadores e detentores de direitos autoraís, redefinindo o conceito de originalidade, aumento de casos de violação de direitos autoraís, questões relativas aos direitos morais e de personalidade, e colaborações envolvendo tanto humanos quanto IA. Além disso, também são destacados os desafios relacionados com a proteção de bases de dados e a proteção de patentes no contexto da IA.

Conclusão: Em conclusão, o avanço da tecnologia de IA introduz complexidades no direito de propriedade intelectual. Os quadros jurídicos existentes, como as leis de direitos de autor, necessitam de uma maior adaptação e clarificação para regulamentar eficazmente as obras geradas pela IA na era digital. Abordar questões relacionadas à originalidade, à criação e a trabalhos colaborativos que envolvam IA requer consideração cuidadosa e ajustes legais. Além disso, os desafios relacionados com a proteção das bases de dados e das patentes no domínio da IA têm de ser abordados para assegurar uma proteção abrangente da propriedade intelectual face à evolução das tecnologias. A adaptação e a clarificação jurídicas são cruciais para navegar na intricada interseção entre a IA e a legislação em matéria de propriedade intelectual.

Palavras-chave: inteligência artificial (IA), direitos autoraís, direitos de propriedade intelectual (DPI), lei de propriedade intelectual, patente.

1 INTRODUCTION

Artificial Intelligence (AI), or artificial intelligence, has become a very significant information technology breakthrough and is booming throughout the world. Rapid advances in this field have opened the door to a variety of applications that are changing the way we interact with technology and the surrounding environment (Davies, 2011). One of the most famous applications of AI is the personal assistant feature on cellphones. Using natural language processing technology, AI like Apple's Siri or Google Assistant...
can understand our verbal commands and provide relevant responses. They can help us search for information, organize schedules, or even carry out certain tasks, making interactions with electronic devices more intuitive and efficient (Thorne, 2020).

Apart from that, chatbots are also a clear example of how AI is used in various applications. Chatbots are computer programs that can communicate with humans via text or voice messages. They can be used in customer service, ticket booking, or even in education. Intelligent chatbots can read and understand our questions, provide relevant answers, and significantly save time interacting with the system (Adamopoulou & Moussiades, 2020). AI has also brought innovation in transportation with the development of autonomous vehicles, such as self-driving and self-parking vehicles. These cars are equipped with advanced sensors and AI systems that enable them to drive themselves without human intervention. This is not only changing the way we travel, but also has huge potential to improve road safety (Cunnen et al., 2019).

The use of AI is not only limited to the digital world. In the physical world, AI technology has also been used in facial recognition or voice detection systems. The system can identify individuals based on their facial characteristics or voice. It is used in a variety of applications, from security to access management (Agarwal et al., 2022). The latest is Elon Musk’s attempt to create a human-like robot or Humanoid. At the recent AI Day event, Musk introduced his vision of a humanoid that could help in various fields of work. Although still in the development stage, these humanoids have the potential to replace humans in dangerous or monotonous tasks. This opens up a discussion about the role of humans in the future and how AI technology will continue to shape the world of work (Kulshreshth et al., 2019; Akili & Achmad, 2023).

In the Indonesian context, President Joko Widodo's (Jokowi) decision to apply artificial intelligence (AI) technology in policy making in Indonesia reflects a strong drive to optimize the efficiency and effectiveness of public services (Indonesia, 2020). In his efforts to accelerate the digitalization transformation of public services, Jokowi has conveyed his plan to replace the role of Echelon III and IV level Civil Servants (PNS) with an AI system. This aims to overcome routine, administrative and repetitive work which often becomes an obstacle in bureaucracy. This step reflects awareness of the great potential of AI technology in speeding up and simplifying administrative processes at the government level. AI has the ability to process data quickly and accurately, which can
reduce the monotonous workload for civil servants (Zsazsa & Sitepu, 2023). Thus, they can focus more on tasks that require wisdom, judgment, and more complex decisions.

The rapid development of digital technology and the ability of Artificial Intelligence (AI) to create works of art and innovation has presented complex challenges in terms of protecting intellectual property or copyright (Sturm et al, 2019; Sidiq et al., 2021). Even though AI is the result of human creation, there is a point where AI can create works with a high level of innovation and theoretically become virtual artists competing with humans (Zatarain, 2017). The fundamental question is: who should have economic and moral rights to work produced by AI?

Currently, the legal framework in most countries confirms that only humans can be recognized as creators of works and have copyright over them. This creates problems when AI creates works, because AI does not have the same legal status as humans (Chesterman, 2020). This also raises the question of whether there are rules that can govern when machines use other people's work or even the work of other AI in the creation process. The World Intellectual Property Organization or WIPO has started discussions on how to face this challenge. WIPO member countries are looking for ways to regulate aspects of intellectual property protection related to AI and AI innovation. This is an important step considering the importance of keeping up with technological developments in law (Avarez-Risco & Del Aguila-Arcentales, 2021).

Many opinions in the legal community state that AI cannot be considered a legal subject that has legal authority and responsibility for its actions. This includes producing works of creation and innovation (Cerka et al, 2017; Bertolini & Episcopo, 2022). The creation of works of art or inventions is the result of the contribution of ideas and human understanding involving creative elements and inventive concepts. Therefore, copyright and patent ownership of AI works is more likely to be granted to those who create, operate, or control the AI (Schuster, 2018).

When designing a new legal framework governing AI and copyright, it is important to consider various aspects, including how to respect human creators, recognize the value of AI innovation, and encourage the development of AI technologies that benefit society (Selvadurai & Matulionyte, 2020). This may involve establishing rules that are flexible and can be adjusted as AI technology develops, so as to maintain a balance between intellectual property protection and technological progress. Therefore, the scope of protection of all elements of intellectual property, including copyright, patents and
trademarks, can be evaluated to provide space for AI designers (Vesala, 2023). This demand is also to provide legal protection for AI creators, if another party uses someone else's artificial intelligence technology to produce creative works of art which they claim as their rights, which could cause economic and moral losses for the AI creator.

2 LITERATURE REVIEW

2.1 COPYRIGHT AND INTELLECTUAL PROPERTY LAW IN INDONESIA

Intellectual Property Rights (IPRs) refer to legal safeguards granted to creative works resulting from human intellectual capabilities in many domains such as art, literature, science, aesthetics, and technology (Merges, 2017). These entities are intangible artifacts that emerge from the cognitive capacities of individuals or humanity. The term "intellectual property" encompasses a range of creative works generated by the human intellect, including innovations, literary and artistic expressions, as well as distinctive symbols, names, and pictures utilized in commercial contexts (Gordon, 1993). Intellectual property is commonly classified into two distinct categories, specifically Copyright and Industrial Property Rights. These intellectual works provide insights into the progress and advancement of various fields such as science, art, literature, and technology. Understanding this evolution is crucial for enhancing the quality of life, fostering civilization, and upholding human dignity (Dreyfuss, 2010).

The inception of copyright regulations in Indonesia can be traced back to the implementation of Auterswet 1912 (Stb. 1912 No. 600). The Auterswet of 1912 was subsequently repealed with the Indonesian government's achievement of establishing its own National Copyright in 1982. This was accomplished by the enactment of Law no. 6 of 1982, which specifically pertains to Copyright. Moreover, the Copyright Law of 1982 underwent amendments by the enactment of Law no. 7 in the year 1987. The initial legislation, Law number. 7 of 1987, underwent subsequent revisions with the introduction of Law no. 12 of 1997. This latter law was then superseded by Law no. 19 of 2002. Presently, the governing legislation is Law no. 28 of 2014 (Jannah, 2018).

In accordance with the provisions stipulated in Law no. 28 of 2014, specifically in article 40, paragraph (1), it can be observed that... Areas protected by copyright include: Books, pamphlets, published displays of written works, and all other written works, lectures, speeches, and other similar creations, including displays created for educational and scientific purposes, songs and/or music with or without text; drama, musical drama,
dance, choreography, puppetry and pantomime, works of fine art in all forms such as paintings, drawings, carvings, calligraphy, sculpture, statues or collages; works of applied art, works of architecture, maps, works of batik art or other motif art, works of photography, portraits, works of cinematography, translations and other works resulting from transformations, translations, adaptations, arrangements or modifications of traditional cultural expressions, compilations of works or data, whether in formats that can be read by computer programs or other media, compilations of traditional cultural expressions as long as the compilation is an original work, video games; and computer programs (Narakarti et al, 2023).

In general, the areas protected by copyright can be classified into three (Hutagalung, 2022), namely:

1) Covers work specified in the Bern Convention, namely the field of literature (literary), artistic work (artistic work), including drama, music and musical drama.

2) Categories that emerged recently due to technological developments, namely cinematography, photography, sound recording, broadcasting, both radio and television.

3) Groups related to computers, namely: Regarding computer programs.

Furthermore, the copyright protection period in Indonesia based on Law Number 28 of 2014 is as follows:

1) Copyright Protection: Lifetime of the Author + 70 Years.

2) Computer Program: 50 years since first published.

3) Performer: 50 years since it was first performed.

4) Record Producer: 50 years since Creation was fixed.

5) Broadcasting Institutions: 20 years since it was first broadcast.

The concept of Intellectual Property (IP) serves as a mechanism to legally safeguard the ownership rights of various intellectual creations, encompassing both collective and individual works. This framework forms the foundation for fostering the growth and advancement of the creative economy. The safeguarding of intellectual property emerges as a crucial aspect of forthcoming national progress and makes a substantial contribution to the advancement of both domestic and global economies. As a developing nation, Indonesia must proactively undertake measures to anticipate and respond to various changes, advancements, and worldwide trends in order to effectively
accomplish its national objectives. One of the crucial measures implemented involves the promotion and safeguarding of intellectual property.

2.2 ARTIFICIAL INTELLIGENCE (AI)

Presently, the vast majority of computer equipment and contemporary technologies have incorporated artificial intelligence. As previously said, the presence of artificial intelligence can be experienced by users when utilizing a smartphone through the use of Google's virtual assistant or Apple's Siri. Artificial intelligence (AI) is anticipated to persist in its advancement and further enhance its cognitive capabilities. Artificial intelligence, commonly referred to as AI, encompasses the development and implementation of machine-based systems that simulate human intellect. These systems are designed to emulate human thought processes and cognitive abilities using programming and modeling techniques (Winston, 1984). According to Mcleod and Schell (year), artificial intelligence (AI) refers to the process of endowing machines, such as computers, with the capacity to exhibit behavior that is deemed to be on par with human intelligence. In essence, artificial intelligence (AI) refers to a computational system capable of doing tasks that typically necessitate human cognitive abilities or physical exertion in order to achieve completion.

Artificial intelligence, commonly referred to as AI, operates through the integration of extensive datasets, rapid and repeated processing, and clever algorithms. This amalgamation enables software to autonomously acquire knowledge from discernible patterns or distinctive characteristics present within the data (Hunt, 2014). Artificial Intelligence (AI) is a comprehensive area of research that spans a multitude of theories, methodologies, and technologies, along with several prominent subfields:

1) The making of analytical models is done automatically by machine learning. AI uses neural network methods, statistics, operations research, and physics to find hidden insights in data without being told to find or assume something.

2) A neural network is a type of machine learning that is made up of units that process information from each other by reacting to outside data and passing information between each unit. This kind of process needs multiple data feeds to find links and make sense of data that doesn't have a clear meaning.
3) Deep learning uses very large neural networks with many layers of working units, takes advantage of improvements in computer power, and improves training methods to find complex patterns in large amounts of data. Image recognition and word recognition are two common uses.

4) Cognitive computing is a branch of AI that looks at how computers can interact with humans in a way that seems natural. The final goal of artificial intelligence (AI) and cognitive computing is for machines to be able to mimic human processes by being able to understand images and speech and then respond in a coherent way.

5) Pattern detection and deep learning are used by computer vision to figure out what is in a photo or video. If machines can process, analyze, and understand photos, they can take pictures or videos of their surroundings in real time and figure out what's going on.

6) Natural language processing, or NLP, is when a machine can read, understand, and even speak human language. The next step in NLP is natural language interaction, which lets people do things with computers by talking to them in normal, everyday language.

AI, which stands for "artificial intelligence," has been used in many areas, such as business, medicine, education, and even everyday life. Here are some everyday uses of AI:

1) DeepFace from Facebook. The first thing that shows AI is the DeepFace technology on Facebook. AI can figure out who is in a picture post by looking at the faces. With this kind of tech, you no longer have to physically tag someone in a photo. Instead, AI will do it for you.

2) Advice for doing business online. AI will figure out what products to suggest based on what you've done in the past, like search for products, buy products, or have seen products. The AI idea of "data mining" will be used to process this information so that AI can recommend products that are right for you.

3) Assistant in cyberspace. There are many services like Google Assistant, Siri, and Alexa that offer virtual assistants. You can talk to virtual helpers, just like you can talk to real assistants. Aside from that, virtual helpers can also keep track of when we have a meeting or event with someone and give us information when
that time comes. You can also tell virtual assistants to send texts, play music, open apps, and do other things.

4) Car auto driver. This system uses computer vision, image recognition, and deep learning to teach itself how to drive a car while staying in a certain lane and dodging unexpected obstacles like pedestrians or roadblocks.

5) The study of robots. Robotics is a branch of engineering that is only about making robots and designing them. Robots are often used to do jobs that are hard for people to do the same way every time. Robotics is often used on car assembly lines or by NASA to move big things in space. Researchers are also building robots that can connect with people using machine learning.

3 METHODOLOGY

This study was conducted utilizing normative juridical research methodology to address the research objectives and address the identified issues. The chosen approach was deemed appropriate for generating valuable findings in line with the research title and concerns. The normative juridical research approach involves conducting library legal research, which entails the examination of library materials or secondary data (Ashsofa, 2007). The purpose of this study was to acquire theoretical frameworks, conceptual frameworks, legal principles, and legal rules pertaining to the subject area. This study aims to investigate the breadth of legal principles by examining both written and unwritten positive law. This study has the potential to inform the establishment of legal rules for the interpretation of laws and regulations. In addition to the aforementioned, this study can also be utilized to identify legal concepts that are formulated either implicitly or expressly (Efendi et al., 2016).

The present study employed data collection tools, specifically library study or document study, to gather secondary data pertaining to the research question. This involved examining books, legal journals, research findings, and regulatory papers. Legislation, exemplified by Law no. 28 of 2014 pertaining to copyright, plays a significant role in governing the protection and regulation of intellectual property rights. The acquired data is further subjected to qualitative analysis, wherein the data is observed and linked to relevant legal requirements and principles pertaining to the examined issue. The process of inductive reasoning involves moving from specific instances to more general principles. In this context, normative tools such as legal interpretation and
construction are employed. These tools are then examined using qualitative methods, enabling the drawing of conclusions through a deductive approach. Ultimately, this method yields a comprehensive conclusion pertaining to the issues and objectives under investigation.

4 RESULTS AND DISCUSSION

4.1 ARTIFICIAL INTELLIGENCE AND COPYRIGHT PROTECTION/INTELLECTUAL PROPERTY RIGHTS

The development of AI has brought about fundamental changes in the copyright context. In the past, copyright was granted to the individual or programmer who created the original work. However, with increasingly advanced AI capabilities, we now face the complex question of who should own copyright to works produced by machines with human-like intelligence. When AI machines are able to create original works without human involvement, debate arises as to whether copyright should be granted to the programmers who created the AI or to the machines themselves (Miernicki & Ng, 2021). It also includes the field of machine learning where machines are able to produce work that does not rely on human data. To avoid further ambiguity and disputes, it is important for the legal system to develop clear regulations and policies regarding copyright in the AI era (Gurkaynak et al., 2016). This will ensure that copyright is recognized and granted fairly, creating a framework that is compatible with these technological developments without compromising human creative rights or fairness in copyright recognition.

In Indonesia, Intellectual Property is defined as rights that arise from the results of human thought that produces products or processes that are beneficial to humans. In other words, one of the main conditions for a creation to be considered Intellectual Property is that the creation must originate from human creativity (Lu, 2021). However, debates surrounding copyright protection for works not created by humans have emerged in various countries, including the famous case in the United States, namely the case of Naruto v. Slater (2018). In this case, there was a debate whether a selfie taken by a monkey named Naruto could be protected by copyright. While the camera owner who lent the equipment to the monkey claimed copyright in the images, opposing parties argued that copyright could only be granted to works created by humans. The final result of the case was that the court ruled that the monkey Naruto could not copyright the photos because he was not human. Naruto v. Slater reflects on the complexity of determining copyright
when the work does not originate from human hands. This is one example of how technological developments and advances in understanding copyright have raised new questions that require further legal clarification in regulating copyright in the digital and AI era (Lloyd, 2018).

In copyright theory, there are two main conditions that must be met in order for a work to be categorized as a work that can be protected, namely originality and fixation. In countries that adhere to a civil law legal system such as Indonesia, emphasis is placed on aspects of the creator's personality in the work produced (Goldstein, 2001). Originality in the context of copyright does not only mean novelty, but rather the unique creative expression of the individual who created the work. Two creators who draw inspiration from the same source can still have original work if they do not copy each other and reflect their own unique personalities and expressions. This understanding is rooted in the belief that each individual has a different perspective and experience, which is reflected in the work they produce (Dinwoodie, 2017). Therefore, when AI produces a work, according to Law no. 28 of 2014 concerning copyright in Indonesia, this work cannot be classified as a creation that can be protected because AI does not have a unique personality like humans and cannot be considered a creator according to the conventional understanding of copyright. This reflects the ongoing debate about how the law should address the role of AI in creating works of art and whether AI should be recognized as a creator in the context of copyright.

Of course, the definition of 'Creator' in Article 1 point 2 of Law no. 28 of 2014 concerning copyright which emphasizes the unique and personal nature of a creation is very important for understanding the concept of originality in the context of copyright in Indonesia. In this definition, personality is the central element which indicates that the creation is the result of a unique expression of the individual who created it. This personality, by definition, can only be possessed by humans. When AI produces work, as you mentioned, it is often the result of a combination and modification of previous works, without any distinctive characteristics or personality like humans have. This raises the question of whether AI works can be categorized as creations that meet the requirements of originality and therefore deserve copyright protection.

In the context of existing copyright law, especially in Indonesia, works produced by AI will not meet the standards of originality required to obtain copyright protection (Story, 2017). Therefore, the debate regarding the recognition of AI as creators in the
context of copyright remains a complex issue, requiring further legal clarification, and taking into account the continued development of AI technology. This also raises the question of how the law should handle copyright ownership and use of works generated by AI, which can be a relevant topic of discussion in the face of increasingly advanced AI technology.

It is important to remember that in addition to the originality requirement, the fixation requirement is also an essential element in copyright. The concept of fixation means that a work protected by copyright must exist in a form that can be maintained and realized in a stable medium (McJohn, 2021). Copyright does not protect the ideas themselves, but only the concrete expression of those ideas recorded in the medium can be preserved. In this case, works produced by AI such as images, songs, or texts are examples of stable media that meet the fixation requirements. However, as previously explained, the two conditions, namely originality and fixation, are cumulative. This means that although an AI work can meet the requirements for fixation because it exists in a form that can be maintained, if the work does not meet the requirements for originality, then the AI work cannot be categorized as a creation worthy of copyright protection (Hutukka, 2023).

In the context of copyright law that applies in Indonesia and many other countries, originality remains an important element that must be met to classify a work as validly copyrighted. This point underlines the importance of a clear understanding of copyright aspects, especially in the face of increasingly complex developments in AI technology. Further discussions and regulations regarding copyright protection in the context of AI remain an important issue in regulating intellectual property in the digital era (Simatupang, 2021).

Copyright is basically the exclusive rights owned by the creator which in Indonesian copyright regulations, copyright is divided into moral rights and economic rights. So, a contrario, if a work is not classified as a creation, then the work does not have special rights so that it can be used by everyone and is in the public domain (Kusmawan, 2014). Even though it is classified as public domain, users must still pay attention to the terms and conditions that apply to the platform where we obtain work produced by AI because when users use the platform, there will usually be terms and conditions that must be agreed upon so that the user is bound by a contractual relationship with the developer and/or platform manager. For example, the terms and conditions set out in Deep Dream.
Generator are as follows: "It is permissible to utilize the resulting images for commercial purposes solely if said images were generated while the user was in possession of an active paid subscription plan or upon the acquisition and utilization of a paid energy pack for said image creation.

It can be concluded that the Copyright Law currently in force in Indonesia cannot accommodate copyright for works produced with AI. However, does this need to be regulated in laws regarding copyright? It should be remembered that the concept of copyright is rooted in the fact that credit is needed for creators so that creators can gain profits from their efforts that are useful for society. Considering the two dimensions of copyright, namely moral rights and economic rights, the author feels that this is not urgent because an AI does not need the above things to survive. So for now, if AI produces a work, according to the Copyright Law the work is not classified as a creation that can be protected and AI is not classified as a creator. However, it does not rule out the possibility that users will still be bound by a contractual relationship with the platform manager so that there may be restrictions on the right to use works produced by AI and it is also possible that there are obligations that users must fulfill towards the platform manager.

4.2 THE IMPACT OF AI DEVELOPMENTS ON COPYRIGHT AND INTELLECTUAL PROPERTY LAW

Artificial intelligence (AI) technology has experienced quite rapid development in the last decade. This technology can help the government and industry in making decisions through complete data presentation algorithms, making things easier in the retail business and helping medical personnel reach the public through online health consultation services. However, the development of AI also has an impact on copyright and intellectual property rights violations and personal data leakage. Therefore, the government and the DPR are expected to make strict regulations regarding the protection and enforcement of the law against violations of the use of artificial intelligence through changes to statutory regulations and through legal interpretations. Here are some of the main impacts that AI developments will have on this field:

4.2.1 Determination of Creator and Copyright

The debate over identifying the creators of works produced by AI is one of the most complex aspects of the impact of AI developments on copyright. Most of the current
copyright regulations around the world still assume that creators are human individuals who have creativity and personal decisions in the process of creating works. However, with AI's ability to produce original works without human intervention in the traditional sense, expanding the definition of authorship and copyright ownership becomes necessary. The fundamental question is whether AI programmers who develop the algorithms and AI models that then produce works have a copyright in those works. On the other hand, can AI itself be considered a copyrightable entity? This is a complex legal issue that requires deep thinking about the concept of copyright ownership in the context of autonomous technologies such as AI.

In many cases, current legal and regulatory interpretations are insufficient to address these types of situations. Therefore, several countries and legal entities have initiated discussions and changes in their copyright regulations to accommodate the role of AI in creating works. Some proposed solutions include granting copyright to AI programmers, recognizing AI as copyright owners, or even creating new categories of copyright that apply specifically to works produced by AI. It is important to seek balanced solutions that enable the development of AI technology while protecting copyright and the interests of human creators. Cross-sector discussion and collaboration among the legal community, the technology industry, and copyright owners is an important step to confront these complexities and ensure that copyright remains relevant and fair in the era of ever-evolving AI.

4.2.2 Originality and Creativity

The concept of originality in the AI era has become a more complex challenge because works produced by AI often rely on existing data, patterns and algorithms. AI creativity is often based on extensive analysis of existing information. The fundamental question is to what extent these works can be considered original if they simply combine or modify existing elements. In some cases, AI may create something new and interesting, but the process is often different from the human creative process involving inspiration, intention, and personal decision making. Therefore, consideration of what is considered original in the context of AI requires revisiting the concept in copyright law. This is an area that requires further attention from the legal community and stakeholders to develop clearer guidance on originality assessments in an era of evolving AI technologies.
4.2.3 Piracy and Copyright Infringement

AI's ability to quickly generate copies and variations of existing works has massively increased the potential for copyright infringement. Moreover, AI can quickly modify works, creating new challenges in detecting and resolving copyright infringement. The importance of detecting copyright infringement appropriately and efficiently is increasingly urgent in an era where works can be easily uploaded, copied and distributed via the internet. In facing these challenges, innovation in copyright monitoring and enforcement tools is critical. The development of monitoring technology capable of quickly and accurately identifying copyright violations using AI methods alone has become a major focus. In addition, collaboration between copyright holders, internet service providers and the government is also important to ensure effective law enforcement. This includes creating regulations that are in line with technological developments and providing effective sanctions against copyright violators. Thus, innovation in monitoring tools and cross-sector collaboration is an important step in facing the increasingly complex challenges of copyright infringement in the AI era.

4.2.4 Moral Rights and Personality

Questions regarding moral rights and personhood in AI work create complex ethical dilemmas. In this context, there are considerations about whether AI should be granted moral rights, which are generally granted to human creators to protect the integrity and reputation of their work. Concerns arise when AI works are used for purposes that may conflict with the values or goals held by the humans who developed or used the AI. An example of this is when AI work is used to spread false information or damage the reputation of an individual or group. It is important to consider the ethical boundaries of using AI work and the role of humans in controlling and being responsible for AI actions. Some approaches being considered include limiting the use of AI to purposes that could be considered ethical, developing specific ethical guidelines for AI use, or giving AI owners greater control over their work. In addition, it is also important to formulate a legal framework that considers these ethical issues in the continuing development of AI technology.
4.2.5 Joint work

Collaboration between humans and AI has paved the way for complex joint works in terms of ownership and copyright. In collaborations of this kind, the role of individual humans in the creation of the work is often less clear in terms of copyright ownership than in works created entirely by humans. Legal clarification is very important in addressing ownership and copyright issues in this collective work. The fundamental question that needs to be answered is to what extent individual human contributions in collaboration with AI are considered creative elements eligible for copyright. Additionally, how copyright between individual human and AI owners compares, if any, must be determined. Is there a distribution of royalties or shared ownership that must be arranged? These are all complex issues that require clear legal clarification. This clarification will help encourage more collaboration between humans and AI by providing legal certainty to all parties involved. This will also help prevent potential disputes over copyright and ownership in the future. As AI technology advances and this kind of collaboration increases, expanding legal frameworks and more detailed guidance are necessary steps to address ownership issues in joint work involving humans and AI.

4.3 CHALLENGES OF AI IN COPYRIGHT PROTECTION AND INTERNATIONAL PROPERTY LAW

In copyright, only the creative expression of a work is protected, such as the source code in a computer program. Algorithms themselves are rarely protected because they are usually considered to not have enough creative aspects. In other words, the code used in AI can be protected by copyright as a form of computer program. However, other people can still create AI systems with the same algorithm but with different source code, which creates challenges in intellectual property protection. There are 3 forms of copyright protection challenges resulting from the application of AI.

4.3.1 Database protection

In AI systems, data plays a key role in the learning and value creation process. The collection, selection, or organization of data used by AI may also be considered a form of intellectual creation subject to intellectual property protection. Some jurisdictions have introduced the concept of sui generis database rights, designed to protect the investment made in the compilation of a database. This means that, although the data may
not be considered an intellectual creation under conventional copyright, database rights may provide protection against significant reuse or extraction of data from the compilation without permission.

However, in the case of conventional copyright, protection does not usually extend to the data contained in the compilation itself. This means that raw data, although it may be an important part of the AI process, is not always protected by copyright. For example, if a company collects massive amounts of data and organizes it in a database for use by their AI, then that database may be protected by sui generis database rights, but the individual data within it may not be protected by copyright. In this context, it is important for data holders and AI developers to understand the legal framework applicable in their jurisdictions regarding data protection and copyright. This will help them protect their investment in data and ensure that the use of data in their AI falls within appropriate legal boundaries.

4.3.2 Patent Protection

Patent protection for software programs is one of the complex aspects of intellectual property law, and differences in approach between various jurisdictions can create challenges. In some jurisdictions, software programs are considered patentable if they meet certain requirements. However, in other jurisdictions, computer programs and mathematical methods are often excluded from patent protection. In the European Union (EU), there is the concept of a “computer-implemented invention” that can qualify for patent protection if it is capable of producing a technical effect. This means that if a software program has a significant impact on a particular technical aspect, such as increasing the efficiency of data processing or optimizing a technical process, then it may be considered for patent protection.

This approach reflects an effort to recognize the real contribution of software programs to technological innovation, while considering safeguards against excessive monopoly that could stifle other innovations. However, the interpretation and application of the concept of “computer-implemented invention” may vary across jurisdictions, which may create uncertainty and differences in the patent protection of software programs around the world. In this context, it is important for software developers and patent holders to understand the applicable patent laws in their region and obtain appropriate legal advice to effectively protect their innovations. Patent protection can be
a powerful tool in driving technological innovation, but it also involves legal complexities that require deep understanding.

4.3.3 Exchange secrets

Since AI systems are usually not adequately protected by copyright or patents, we can consider protecting AI algorithms as trade secrets. However, the legal approach to trade secrets varies by jurisdiction. Provisions regarding tort, privacy, confidentiality or unfair competition usually apply to trade secrets. This protection does not preclude discovery by fair and honest means, such as independent creation or reverse engineering. It is also technically difficult and legally risky to prevent software reverse engineering in AI, as contractual restrictions to achieve this can be deemed null and void in some jurisdictions.

Due to their confidential nature, trade secret protection contributes to the “black box” problem and becomes a barrier to the exchange of data and technology. Therefore, from both policy makers' and rights holders' perspectives, the best approach is to combine trade secret protection with copyright and patent protection, as is generally done for traditional software and related inventions.

5 CONCLUSION

In the era of development of artificial intelligence (AI), copyright and intellectual property law face complex challenges. A fundamental question arises about who should own copyright to works produced by increasingly sophisticated AI machines. Should copyright go to the AI programmer or to the machine itself? Issues such as originality, fixation, moral rights, personhood, and collective work are increasingly confusing in the context of AI. This created a debate about how the law should address the role of AI in creating works of art and whether AI should be recognized as a creator in the context of copyright. In Indonesia, the Copyright Law emphasizes that creations must originate from human creativity and have unique personality traits. Therefore, AI-generated works currently do not meet the standards of originality required to obtain copyright protection. However, use of an AI work remains bound by the terms and conditions of the platform that generated it, and this may limit a user's rights to the work.

The impact of AI developments on copyright and intellectual property law includes the determination of creators and copyright, changes in the concept of originality,
increased copyright infringement, issues of moral and personality rights, and joint works involving humans and AI. Apart from that, the development of AI also presents challenges for copyright to be able to provide protection which includes database protection and patent protection which is also an important issue in the context of AI. It is important for AI rights holders and developers to understand the applicable laws and obtain appropriate legal advice. In facing these challenges, there is a need for cross-sector collaboration and further discussions to develop clearer guidelines on copyright in the ever-evolving era of AI. It also requires innovation in copyright monitoring and enforcement tools as well as ethical considerations in the use of AI. Overall, the development of AI introduces additional complexity in intellectual property law, requiring further legal adaptation and clarification to regulate copyright and intellectual property in this digital era.
REFERENCES


24. Law no. 28 of 2014 concerning copyright in Indonesia.


