Artificial Intelligence and Intellectual Property Protection in Indonesia and Japan

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ABSTRACT

This research aims to show the impact of artificial intelligence (AI) on fillings patent protection through patent rights. This research is normative legal research using a comparative legal approach in the Japanese AI protection system. The results indicate that the regulation of AI protection in intellectual property rights in Indonesia has not been accommodated in the Indonesian national legal system. However, the closest method for its protection can be performed through copyright, but it still has shortcomings, where AI in copyright protection is only considered the same as that of ordinary computer software in general, which should have significant differences. AI protection space in Japan can be accommodated through patents, provided that the AI in question contains elements or categories that can be protected through Japanese patents. AI protection as a patent right, in fact, has a very complicated and varied impact in Indonesia and Japan.

1. Introduction

The law governing intellectual property covers a broad and varied range of topics, including but not limited to books, literary works, computer programmes, and even the genetic modification of animals and plants.[1] It is unclear where the concept of "intellectual property rights" came from, according to Professor Mahdi. According to the World Trade Organization (WTO), intellectual property rights

[1]Anastasia Baan, Markus Deli Girik Allo, and Andi Anto Patak, 'The Cultural Attitudes of a Funeral Ritual Discourse in the Indigenous Torajan, Indonesia', *Heliyon*, 8.2 (2022), e08925 https://doi.org/10.1016/j.heliyon.2022.e08925

are an exclusive right that is bestowed upon a person for the labour of his or her mind for a specific period of time.[2]

Human intelligence is the source of intellectual property rights, which are property rights to works owned by the people who created them. This means that not everyone is capable of producing the same results.[3] As a consequence, the accomplishments of the human mind inevitably culminate in the establishment of exclusive rights. There are 4 (four) principles that govern intellectual property rights. They were developed in order to strike a balance between the interests of individuals and the interests of society. The principle of natural fairness, the argument from economic necessity, the argument from cultural necessity, and the consensus reached by society are these principles.[4]

The ownership of intellectual property in Indonesia is governed by a number of different laws and regulations. One of the provisions that is unique to each type of intellectual property is that of protected by that type of intellectual property.[5] However, there are no regulations that particularly control AI as an intellectual property object. This means that AI is not subject to any intellectual property laws. In light of this, the Ministry of Communication and Information of the Republic of Indonesia asserts that there is a requirement for rules concerning artificial intelligence (AI). For this reason, AI needs to be categorised as an intellectual property item based on its characteristics in order to further establish which intellectual property rights are acceptable.

The term AI has been used interchangeably with "human intelligence" for the better part of a decade now. The term refers to a set of technologies that include knowledge-based systems, natural language processing (NLP), and machine learning (ML).[6] AI is described as a system that analyses external data by learning and adapting from large amounts of data and is utilized to accomplish a particular

[2]Nobuaki Yamashita, 'Economic Crisis and Innovation Capacity of Japan: Evidence from Cross-Country Patent Citations', *Technovation*, 101.November 2020 (2021), 102208 https://doi.org/10.1016/j.technovation.2020.102208

[3]A.S. Albahri and others, 'A Systematic Review of Trustworthy and Explainable Artificial Intelligence in Healthcare: Assessment of Quality, Bias Risk, and Data Fusion', *Information Fusion*, 96.March (2023), 156–91 https://doi.org/10.1016/j.inffus.2023.03.008

[4]Christian Rammer, Gastón P. Fernández, and Dirk Czarnitzki, 'Artificial Intelligence and Industrial Innovation: Evidence from German Firm-Level Data', *Research Policy*, 51.7 (2022) https://doi.org/10.1016/j.respol.2022.104555

[5]Sandra Maria Correia Loureiro, João Guerreiro, and Iis Tussyadiah, 'Artificial Intelligence in Business: State of the Art and Future Research Agenda', *Journal of Business Research*, 129.November 2020 (2021), 911–26 https://doi.org/10.1016/j.jbusres.2020.11.001

[6]Colin R. Davies, 'An Evolutionary Step in Intellectual Property Rights - Artificial Intelligence and Intellectual Property', *Computer Law and Security Review*, 27.6 (2011), 601–19 https://doi.org/10.1016/j.clsr.2011.09.006

objective. AI, as defined by Marvin Minsky, is the study of teaching computers to perform tasks that normally require human intelligence.[7]

AI, in contrast to human labour, does not require incentives and does not rely on the provision of rewards for employees to work. Instead, AI just requires data and processes to function well.[8] It is believed that the development of technologies such as AI will be able to assist businesses in the future in reducing the costs incurred and/or increasing the value or assets obtained by developing and converging technologies such as the integration of AI, semantic studies, robotics, and mechatronics development. It is believed that these technologies will be able to help businesses in the future.[9]

Darmawan indicated that the adoption of AI in Indonesia has reached 24.6% and that it is anticipated to continue to rise. As a result, Indonesia is now one of the nations in ASEAN with the highest ranking for the adoption of AI, followed by Thailand in second place. It does not only demonstrate that AI is currently being utilized to a significant degree in Indonesia compared to the other ASEAN countries, but it may also serve as a point of reference for the anticipated growth of AI in Indonesia in the upcoming years.

Since the deployment of such technology can replace human's role, the effective development of AI needs to take into consideration the effects of its implementation on society and policymakers. Hence, the overarching law, just like technology, must likewise be able to keep up with the innovations that are occurring around it. Rahardjo contends that the law is created for humans and not the other way around, that the law revolves around humans, and that it is only natural for the law to be created to fulfill the fundamental rights of society. Legal advancements are required, particularly in the area of putting artificial intelligence technology into practice, given the superior achievements of the Indonesian state, in order to ensure that the fundamental rights of the community can be further fulfilled.

There are a number of policies pertaining to intellectual property rights that are currently in effect in Indonesia. These regulations cover topics such as copyright, patents, trade secrets, industrial designs, and a number of other restrictions. On the other hand, the rules and regulations now in place do not have any safeguards that protect AI in particular.[10] According to McKinsey & Company, Indonesia needs a proactive strategy in the implementation of AI technology that involves all stakeholders in order to compete in the global and ASEAN markets. This is because

[7]Tarso Mesquita Machado and Eduardo Winter, 'Artificial Intelligence and Patents in Brazil: Overview on Patentability and Comparative Study on Patent Filings', *World Patent Information*, 72.February (2023), 102177 https://doi.org/10.1016/j.wpi.2023.102177

[8]Yamashita, 'Economic Crisis and Innovation Capacity of Japan: Evidence from Cross-Country Patent Citations'. https://doi.org/10.1016/j.technovation.2020.102208

[9]Onur Sari and Sener Celik, 'Legal Evaluation of the Attacks Caused by Artificial Intelligence-Based Lethal Weapon Systems within the Context of Rome Statute', *Computer Law and Security Review*, 42 (2021), 105564 https://doi.org/10.1016/j.clsr.2021.105564

[10]Rammer, Fernández, and Czarnitzki.

regulations related to the intellectual property rights of AI will become an important issue, especially given the various challenges and problems that will arise from the implementation of AI.

This research will be focused on AI as a form of creation that takes the form of computer programs by Copyright when it is categorised into the laws and regulations related to intellectual property rights in Indonesia. The laws and regulations are based on the identification of AI. To get a general idea of how well AI is protected inside the national intellectual property protection system, it is necessary to pose the question on how AI is protected under the patent regime in Indonesia that finally becomes an important issue to ask.

In Indonesia, patent rights in the technology protection space are only granted to technological works or innovations that, after processing, produce a product or consist only of a method. When exploited, it will also provide economic benefits. This is what the law protects. This legal protection is not automatic, there needs to be an application first. As part of Science and Technology, Information and Communication Technology (ICT) includes all technologies relating to the gathering, collection (acquisition), processing, storage, dissemination and display of information. This concept includes hardware, software, content, as well as computer and telecommunications infrastructure.[11] Information and Communication Technology (ICT) inventions currently receiving patent law protection in Indonesia are in the form of a Related Invention Program, which is a computer program related to hardware (hardware) or only information technology devices in the form of hardware (hardware), whereas the Copyright Act protects software in Indonesia. Therefore, legislative harmonization is required for the patent protection of relevant computer programs that are not covered by Copyright.[12]

This also applies to AI, where Japan safeguards it through the use of patents, as is the case with Japan's protection of computer software programs under the patent regime. The legal battle that Samsung and Apple are currently engaged in is a fascinating example of a case study. One good example can be found in the conflict that has been going on between PT Subur Semesta and Tjia Tek Ijoe in Indonesia. Patents governed by Law No. 13 of 2016 concerning Patents (henceforth referred to as the Patent Law) mandate that patent protection include both a. Patent and b. Simple Patent. Then, a patent, as described in Article 2 letter a, is awarded for a novel invention that comprises an innovative step and is applicable to industry. A simple patent, as defined by Article 2 letter b, is awarded for each new invention or development of an existing product or technique and is applicable in industry.

[11]Enric Castelló, 'Storytelling in Applications for the EU Quality Schemes for Agricultural Products and Foodstuffs: Place, Origin and Tradition', *Spanish Journal of Agricultural Research*, 18.2 (2020), e0105 https://doi.org/10.5424/sjar/2020182-16192

[12]Yuliana Diah Warsiki Susi Irianti Diah Warsiki Susi Irianti, 'Perjanjian Benefit Sharing Sebagai Upaya Perlindungan Dan Pemanfaatan Varietas Tanaman', *Rechtidee*, 12.1 (2017), 1 https://doi.org/10.21107/ri.v12i1.2855

The following are not considered to be patentable inventions according to the regulations of the simple patent, works of art and plans. The fact that the rules of the patent law do not apply to the regulation of software protection in Indonesia is made clear in the article that came before this one. The copyright law allows for software protection, as was previously mentioned; however, it is essential to emphasize that the copyright law does not apply to matching computer programs that are implemented in the form of software. In addition, it is unclear if the protection space for artificial intelligence is simply included in the classification of software despite the enormous difference.[13] The following question is whether or not the protection of AI in Indonesia is attached to copyright and whether or not it provides security guarantees for the users of AI. For this reason, the authors faced a conundrum when writing this article: what is the best patent system that can provide legal protection for computer program creators, particularly AI creators, in such a way that it not only provides protection for creators but also provides protection for users or consumers. This is something that the copyright regime has not taken into consideration.

2. Research Method

This research employs normative juridical research, which is the process of identifying the applicable rule of law, legal principles, and legal doctrines to address the legal challenges at hand. Regarding the standard legal research approach, the strategy for collecting legal materials is document analysis or literature review.[14] The authors used both the statutory method and the comparative legal approach.[15] vIn particular, by investigating the sections of the Patent Law and the Copyright Law relating to the protection of computer programme creators, specifically in the form of application software and Artificial Intelligence (AI) that are not protected by copyright, this can be accomplished, which are then compared with the provisions pertaining to the same subject, which in this case, the author compared with the patent protection arrangement between Japan.[16]

3. Results and Discussion

Artificial Intelligence and Intellectual Property Protection in Indonesia

Article 40 of Law No. 28 of 2014 concerning Copyright protects regulations on ICT inventions in Indonesia, including computer programs. (1). In addition to works of science, art, and literature, protected works consist of computer

[13]Margaret A. Goralski and Tay Keong Tan, 'Artificial Intelligence and Sustainable Development', *International Journal of Management Education*, 18.1 (2020) https://doi.org/10.1016/j.ijme.2019.100330

[14] Rika Kurniaty, 'The Features and Future Challenges of Indonesian Antimonopoly Policy: Lesson Learned from Japanese Experience', *Procedia Environmental Sciences*, 17 (2013), 999–1006 https://doi.org/10.1016/j.proenv.2013.02.119

[15] Agus Raharjo and others, 'The Legal Policy of Criminal Justice Bureaucracy Cybercrime', *Bestuur*, 10.2 (2022), 105–22 https://doi.org/https://doi.org/10.20961/bestuur.v10i2.64498

[16] Paweł Marcin Nowotko, 'AI in Judicial Application of Law and the Right to a Court', *Procedia Computer Science*, 192 (2021), 2220–28 https://doi.org/10.1016/j.procs.2021.08.235

programs. Article 40, paragraph 1 of the Copyright Law No. 28 of 2014 states that protected inventions include works of science, art, and literature. This essay makes it quite evident that the technological sector is not a Copyright-protectable work. Article 40, paragraph 1, of Law No. 28 of 2014 concerning Copyright lists computer programs as one of the compositions that can be protected. A computer program is a sort of technology in the field of Information and Communication Technology. (ICT). This demonstrates that there is no legal certainty since the language of the Article is ambiguous.[17]

An innovation in the field of Information and Communication Technology (ICT) is a computer program, which is a sort of software. This indicates that a patent method can still protect software if the software associated with the computer program can address technical and technology-related problems and if the country of origin offers patent protection. Existing disagreements exist in Indonesia over software protection in the form of computer programs. Information from the Indonesian Directorate General of Intellectual Property (DJKI) indicates that software can still be protected with a patent system provided. It can address technology-related technical difficulties and has patent certificate protection from its country of origin.[18]

Article 4 of Law No. 13 of 2016 states that invention does not include aesthetic creations, schemes, rules, and methods for carrying out activities that involve mentality, games, and business, rules and methods that only contain computer programs, presentation of information and findings (discovery) in the form of a new use for an existing and/or known product and/or a new form of an existing compound that does not result in a significant increase in efficacy, and what is meant by "rules and methods that only contain computer programs" in the explanation of Article 4 letter d is computer programs that only contain programs without having characters, technical effects, and problem-solving. However, if the computer program has characters (instructions) that have techniques and functions to produce tangible and intangible problem-solving, then the invention is patentable. 1) Algorithms, which are effective methods stated as a small set of well-defined instructions for calculating a function, are examples of patentable innovations.[19]

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[17] Prijo Sidipratomo and others, 'Intra-Arterial Chemotherapy for Retinoblastoma: Our First Experience in Indonesia', *Radiology Case Reports*, 17.12 (2022), 4713–16 https://doi.org/10.1016/j.radcr.2022.09.004

[18] Alia Bihrajihant Raya and others, 'Challenges, Open Innovation, and Engagement Theory at Craft Smes: Evidence from Indonesian Batik', *Journal of Open Innovation: Technology, Market, and Complexity*, 7.2 (2021), 121 https://doi.org/10.3390/joitmc7020121

[19] Yusi Anggriani and others, 'The Impact of Pharmaceutical Policies on Medicine Procurement Pricing in Indonesia Under the Implementation of Indonesia's Social Health Insurance System', *Value in Health Regional Issues*, 21 (2020), 1–8 https://doi.org/10.1016/j.vhri.2019.05.005

These instructions describe a computation that, when run, is processed via a finite number of well-defined sequences of conditions, producing an "output" and terminating in a final state. Some algorithms, known as randomization algorithms, employ random input; 2) Encryption of information utilizing encoding and decoding to randomize it so that it cannot be read by unauthorized parties. According to Article 4 of Law No. 13 of 2016 respecting Patents, "rules and methods that do not only contain computer programs" may be utilized as patent subjects if an interpretation is performed. It can be assumed that the given computer program contains characters (instructions) that have technological effects and functions to generate physical and intangible issue solutions. In this scenario, the innovation is one that can be patented.[20] Infringement of a patent may have both civil and criminal features.[21]

Regarding patent infringement from a civil perspective, a claim for damages may be brought. Nonetheless, Law No. 13 of 2016 pertaining to Patents specifies that those who feel aggrieved by this infringement may seek the Commercial Court to take the following actions: *First*, prohibiting the continuance of patent infringements and violations of patent-related rights, including the entrance of goods suspected of breaching patents and rights relating to patents into trade channels, including importation; *Second*, keeping evidence related to patent infringement and rights related to said Patent in order to prevent evidence from being destroyed; and *Third*, requesting the aggrieved party to provide evidence stating that the aggrieved party is indeed entitled to a Patent and rights related to a Patent and that the applicant's rights are indeed being violated.[22]

The implementation of criminal punishment for patent infringements with a criminal component is governed by Law Number 13 of 2016. In the case of Product Patents, creating, using, selling, importing, renting, delivering, and/or making available for sale, renting, or submitting Patented items is banned for anybody who intentionally and without authorization commits an infringement. Using a patented production technique to manufacture products or other acts (manufacturing, using, selling, importing, leasing, delivering, and/or making available for sale, renting, or delivering the patented product) is punishable by up to three years in jail, four years in prison and/or a maximum punishment of IDR 1 billion (one billion rupiah). Infringement of a simple patent is punishable by

[20] Z Kaló, A Inotai, and KE Wijaya, 'Value-Based Decisions for Off-Patent Pharmaceuticals in Developing Countries – A Pilot Study Using Multi-Criteria Decision Analysis for Tenders in Indonesia', *Value in Health*, 21 (2018), S45 https://doi.org/10.1016/j.jval.2018.07.342

[21] Rui Qing Wu and others, 'Adaptive Wide-Lens Distortion Correction Based on Piecewise Polynomial Optimization', *Procedia Computer Science*, 154 (2018), 573–80 https://doi.org/10.1016/j.procs.2019.06.091

[22] Radityo Prakoso and others, 'Initial Experience in Transcatheter Closure of Patent Ductus Arteriosus Without Fluoroscopy in Indonesia', *Journal of the American College of Cardiology*, 75.11 (2020), 607 https://doi.org/10.1016/s0735-1097(20)31234-1

imprisonment for a maximum of two years and/or a fine of up to IDR 500,000,000.00 (five hundred million rupiahs). The causes health issues and/or a maximum fine of IDR 2,000,000,000.00 may be imposed. It results in human death, the penalty is a maximum of ten years in jail and/or a fine of up to three billion rupiah (three billion five hundred million rupiahs).[23]

The Indonesia's intellectual property laws pertaining to copyright do not include a specific place for AI protection. The copyright protection of computer programs is the most similar concept to that of AI protection. This is because, according to the classification of the type of creation in the e-copyright application, computer programs are included in other types of works. These other types of works are required to attach a manual that explains how to use the computer program, along with its source code, in the e-rights application. One single PDF file contains a compilation of all of them. According to the Copyright, Designs, and Patents Act of 1988, computer programs are considered to be literary works.[24]

The Copyright, Designs and Patents Act of 1988 does not provide a definition of originality for the purposes of the copyright protection of computer programs. This is one of the requirements that must be satisfied before a piece of work may be granted copyright protection. In the case of "Sudwestdeutsche Inkasso KG v. Bappert and Burker Computer GmbH" in Germany, it was explained that in order for a computer program to be protected by copyright, the computer program must be the result of individual creativity that exceeds the average ability seen from the development of the computer program. Additionally, the computer program must be the result of a dispute between two parties. Borkin recognized three fundamental steps that are necessary for the copyright protection of software. These stages consist of the protection of programming algorithms, the protection of computer programs through a patent or copyright, and the protection of program object code.[25]

Then, in general, computer programs can be separated into two groups: the first is known as the system programs, and the second is known as the applied programs or application programs. The copyright protects both system programs and applied programs, sometimes known as application programs. Computer programs, when broken down into their component elements, include both software and hardware. The contents that are contained in the software are

[23] E. Olivares and others, 'Applications of Information Channels to Physics-Informed Neural Networks for WiFi Signal Propagation Simulation at the Edge of the Industrial Internet of Things', *Neurocomputing*, 454 (2021), 405–16 https://doi.org/10.1016/j.neucom.2021.04.021

[24] Xue Gao and Yi Zhang, 'What Is behind the Globalization of Technology? Exploring the Interplay of Multi-Level Drivers of International Patent Extension in the Solar Photovoltaic Industry', *Renewable and Sustainable Energy Reviews*, 163.April 2021 (2022), 112510 https://doi.org/10.1016/j.rser.2022.112510

[25] Wei Li and others, 'Plant Pan-Genomics: Recent Advances, New Challenges, and Roads Ahead', *Journal of Genetics and Genomics*, 49.9 (2022), 833–46 https://doi.org/10.1016/j.jgg.2022.06.004

categorized by the WIPO as supporting materials, guidance for using the program, strings of commands, and the look and feel of the program.[26]

As a result of this split, it is possible to recognize that a computer program contains a number of different programs and devices. For this reason, it is essential to have a deeper understanding on the components of a computer program that are subject to copyright protection. It was contended in the case known as "Cantor Fitzgerald International v. Tradition (UK) Ltd." that even the tiniest component of a computer program needs to be included as an essential component for the computer program to function properly. This opinion was later disproved by Pumfrey J., who argued that the purpose of copyright is to safeguard the talent and labour of the creator in order to ensure that the creator will be afforded protection for the substance that is indispensable to the inventor. However, in a computer program, even the tiniest component could not always be an indispensable component for the purpose of being able to offer instructions.[27]

The reproduction of material in any form, including its storage in any medium, is what is meant by the term "duplication," as defined by a computer program that has been given the status of a literary work. In this context, the process of duplicating data on a computer involves loading a program into the volatile memory (RAM) of the machine. The expression of a computer program's system or method, as opposed to the program's function, is protected by copyright in the United States on the basis of multiple judicial judgments. This copyright protection is granted for computer programs' source code as well as their object code.[28]

In the domain of AI protection, which is analogous to the protection of computer software in Indonesia, it is not possible to protect it through patents. This is the case if AI is seen solely within the context of computer software. Patent protection was initially awarded to inventions that were the result of the inventor's embodiment of a concept into a tangible form. This is in contrast to the protection afforded to computer programs, which do not become tangible despite having been converted from a concept. There is a point of contention surrounding the notion

[26] Hu Shuijing, 'Quantitative Analysis of China's Artificial Intelligence Technology Patents', *Procedia Computer Science*, 208 (2022), 18–23 https://doi.org/10.1016/j.procs.2022.10.004

[27] Jian Liu and others, 'Macroalgae as a Potential Source of Biomass for Generation of Biofuel: Artificial Intelligence, Challenges, and Future Insights towards a Sustainable Environment', *Fuel*, 336.August 2022 (2023), 126826 https://doi.org/10.1016/j.fuel.2022.126826

[28] Nikolaos Papageorgiadis, Adam R. Cross, and Constantinos Alexiou, 'The Impact of the Institution of Patent Protection and Enforcement on Entry Mode Strategy: A Panel Data Investigation of U.S. Firms', *International Business Review*, 22.1 (2013), 278–92 https://doi.org/10.1016/j.ibusrev.2012.04.005

that computer programs are nothing more than collections of algorithms, which, given that they are mathematical procedures, cannot be copyrighted.[29]

Artificial Intelligence and Intellectual Property Protection in Japan

Since the implementation of the Patent Act No. 21 of 1959 (Article 70), Japan has controlled the scope of protection, which is comparable to that of the United States. Marzuki noted that patent protection in Japan is identical to that of the United States because Japan imitates the American system, which is seen as a balanced method for establishing the scope of protection.[30] This law intends to foster innovation by supporting its preservation and exploitation in order to contribute to the industry's growth and expansion. Concepts and ideas that cannot be seen with the human eye are inventions and utility models. Therefore, enough protection must be provided by the system.[31] A discovery should be protected from theft by being kept a secret. On the other side, this would prevent the creator from putting his idea to practical use and force others to wastefully squander resources developing identical items. In order to prevent such events, the Patent system must be constructed to prevent them. The patent system is intended to give protection to the inventor whose invention is granted an exclusive patent under certain restrictions and for a specified time period. This method is also intended to help to industrial growth by encouraging technical advancement and facilitating the exchange of new technological resources through the publication of new innovations.[32]

The issue on protection under the system for utility models is simply described as "utility models concerning form, structure, or combination." This differs from the protected subject matter in the Patent system. (e.g. a method cannot be subject to registration in the Utility Model). Nonetheless, the objectives of both systems are same. The purpose of patent law protection is primarily to safeguard innovative technical concepts. Consequently, a technique of computation or encryption defined by arbitrarily set rules, such as those for banking and insurance systems or taxation procedures that are not based on rules, is not a protected topic. Even discoveries, such as the accidental discovery of Newton's laws, are not protected.[33] In order for a product to be protected, it must be characterized by a high degree of

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[29] Yoonjae Nam and George A. Barnett, 'Globalization of Technology: Network Analysis of Global Patents and Trademarks', *Technological Forecasting and Social Change*, 78.8 (2011), 1471–85 https://doi.org/10.1016/j.techfore.2011.06.005

[30] Hidemichi Fujii and Shunsuke Managi, 'Trends and Priority Shifts in Artificial Intelligence Technology Invention: A Global Patent Analysis', *Economic Analysis and Policy*, 58.2018 (2018), 60–69 https://doi.org/10.1016/j.eap.2017.12.006

[31] Kaló, Inotai, and Wijaya.

[32] Takayuki Yamanaka and Shingo Kano, 'Patent Term Extension Systems Differentiate Japanese and US Drug Lifecycle Management', *Drug Discovery Today*, 21.1 (2016), 111–17 https://doi.org/10.1016/j.drudis.2015.09.005

[33] Wei Hu, Tohru Yoshioka-Kobayashi, and Toshiya Watanabe, 'Determinants of Patent Infringement Awards in the US, Japan, and China: A Comparative Analysis', *World Patent Information*, 60.July 2018 (2020), 101947 https://doi.org/10.1016/j.wpi.2019.101947

technological originality. Creations characterized by a low level of technological innovation cannot be protected. In sections 2 and 3 of the utility model legislation, the object of protection is a product shape, structure, or combination of related products created utilizing inventive technical conceptions based on natural laws and regulations. Consequently, procedures linked to goods are not a protected topic if they merely relate to the product's shape and form, etc. In addition, ingenuity is devoted to the creation of obsolete technical concepts for protected artifacts. The Intellectual Property Basic Act Number 122 of 4 December 2002, as recently revised by Law Number 119 of 16 July 2003, requires this for protected objects.[34]

The term "intellectual" refers to human-created innovations, gadgets, novel plant kinds, designs, qualities, and others (including the discovery or resolution of natural phenomena applied to industry), trademarks, and trade secrets. Also, other trademarks denote business-related products or services, trade secrets, and other technical or significant company information. The phrase "Intellectual Property Rights (IPR)" as used in this Law refers to patent rights, utility models, plant varieties, designs, copyrights, trademark rights, and other rights specified by law. Other intellectual property or rights laws and regulations pertaining to the interests protected by the act.[35]

In order to receive a patent, a patent application must be filed to the Japanese Patent Office, which will then analyse the application to decide if it fits all requirements.[36] Before granting the patent, the Japanese Patent Office, which scrutinizes all applications globally, took measures. This entails exchanging information with the applicant in order to identify which claim, if any, is patent-eligible. Following are the procedures for getting a patent in Japan.[37] Application, no matter how beneficial an innovation may be, a natural patent cannot be secured until it is applied for. One must complete out the forms provided by the applicable rules and submit them to the Japanese Patent Office (JPO) in order to submit an application. Japan has implemented a first-to-file approach, which stipulates that if two parties apply for a patent for the same invention, the patent will be issued to the first applicant. Therefore, it is advised to file as quickly as possible following

[34] Sachie Inoue and others, 'Cost-Effectiveness Analysis of Percutaneous Patent Foramen Ovale Closure Preventing Secondary Ischemic Stroke in Japan', *Journal of Stroke and Cerebrovascular Diseases*, 30.8 (2021), 105884 https://doi.org/10.1016/j.jstrokecerebrovasdis.2021.105884

[35] Nobuaki Yamashita, 'Economic Crisis and Innovation Capacity of Japan: Evidence from Cross-Country Patent Citations', *Technovation*, 101.October 2020 (2021), 102208 https://doi.org/10.1016/j.technovation.2020.102208

[36] Jiaming Jiang and others, 'The Dataset of Japanese Patents and Patents' Holding Firms in Green Vehicle Powertrains Field', *Data in Brief*, 44 (2022), 108524 https://doi.org/10.1016/j.dib.2022.108524

[37] Masayuki Morikawa, 'Innovation in the Service Sector and the Role of Patents and Trade Secrets: Evidence from Japanese Firms', *Journal of the Japanese and International Economies*, 51.October 2018 (2019), 43–51 https://doi.org/10.1016/j.jjie.2018.10.003

discovery. In addition, it is prudent to make an innovation public only after filing for a patent.[38]

In terms of Examination Formality, the JPO will assess whether a submitted application document fulfils the necessary procedural and formal standards. Once there are missing or incomplete needed papers or sections, invitations to repair will be issued.[39] The Application Publication is not checked, the JPO will then publish the application's contents in the Official Gazette 18 months following the date of submission. In terms of Inspection Request, patent applications are only seldom reviewed. Only applications for which the applicant or a third party has made a request for examination and paid the examination fee will be examined.[40] Declared to Resign (Not Making Request for Examination), any application for which a request for inspection has not been made within three years from the date of filing is automatically deemed withdrawn and cannot be patented thereafter.[41]

Substantive Examination means an examiner from the JPO will conduct the examination and determine whether the claimed invention should be granted a patent. First, the examiner determines if the application fits the legal criteria, i.e., whether there are reasons for denial. These requirements include: 1) whether the invention is claimed to be based on a technical idea that utilizes natural laws; 2) whether there has been an industrial application; 3) whether the technical idea existed prior to the submission of the current application; 4) whether the invention is claimed to be easily discovered by experts in the field; 5) whether the application is the first to be submitted; 6) whether the claimed invention may be subject to a clout; and 7) whether the claimed invention may be subject to a clout Does the description in the specification precisely meet the Patent's requirements.[42]

Reasons for rejection must be communicated. If the examiner discovers grounds for denial, the applicant will be notified since they have composed Arguments/Changes. An applicant who has received a notification of the reasons for the refusal must be permitted to submit either a written argument claiming that the invention is distinct from the prior technique to which the notification of reasons for refusal refers, or a change of claim if this would supersede the reasons

[38] Federico Caviggioli, 'Foreign Applications at the Japan Patent Office - An Empirical Analysis of Selected Growth Factors', *World Patent Information*, 33.2 (2011), 157–67 https://doi.org/10.1016/j.wpi.2010.12.002

[39] Masayo Kani and Kazuyuki Motohashi, 'Understanding the Technology Market for Patents: New Insights from a Licensing Survey of Japanese Firms', *Research Policy*, 41.1 (2012), 226–35 https://doi.org/10.1016/j.respol.2011.08.002

[40] L. Aldieri and others, 'Waste Recycling Patents and Environmental Innovations: An Economic Analysis of Policy Instruments in the USA, Japan and Europe', *Waste Management*, 95 (2019), 612–19 https://doi.org/10.1016/j.wasman.2019.06.045

[41] Nikolaos Papageorgiadis, Adam R. Cross, and Constantinos Alexiou, 'International Patent Systems Strength 1998-2011', *Journal of World Business*, 49.4 (2014), 586–97 https://doi.org/10.1016/j.jwb.2013.12.011

[42] Budi Nugroho and others, 'Combined Graph Kernels for Automatic Patent Classification: A Hybrid Approach', *World Patent Information*, 57.April 2018 (2019), 18–24 https://doi.org/10.1016/j.wpi.2019.03.002

for refusal. Decision to Grant a Patent takes place if no grounds for rejection are uncovered throughout the examination, the examiner will award the patent as the final evaluation of the examination phase. In addition, the examiner will determine if arguments or revisions have eliminated the basis for rejection. Rejection Determination, in contrast, takes place if the examining judge determines that the reasons for denial have not been eliminated, a refusal judgment (the examination stage's final evaluation) will be rendered. If the rejection decision of the examiners does not meet the applicant's satisfactory, the applicant may file an appeal against the refusal decision.[43]

Consideration of appeals (on decisions of rejection) refers to the examination of appeals against denial judgments is conducted by a group of three to five appellate examiners. The decision on appeal made by the examiners is known as the appeal decision. When it is determined that the grounds for the denial have been addressed as a consequence of the appellate investigation, and when the appellate examiner believes that the reasons are irreversible, a decision is made to award the patent. The Patent cannot be registered, and a determination is made about the appeal for denial. Registration (patent payment fee) means assuming the applicant pays the Patent fee following the decision to award a Patent, the Patent right will take effect as recorded in the Patent Register, provided the applicant pays the Patent fee.[44]

Concurrently, the innovation was granted many patents. After the Patent is registered, the applicant will receive a patent certificate. Disclosure of Patent Sheets/Certificates Patent Gazette will announce the contents of patent rights listed in the Register. Requisition for Cancellation Even after a patent is registered, anybody may request its revocation if it contains flaws. Assessment of Appeal (Cancellation) refers to a group of three or five appellate examiners conducts the examination of annulment appeals. If the appeal examiners determine that the decision to issue the patent was correct, they will elect to maintain it. However, if they determine that the grant judgment was defective, they will deem the patent invalid. High Intellectual Property Court, the Applicant who is unsatisfied with the appeal decision of the refusal to appeal the refusal judgment, and interested parties who are dissatisfied with the appeal decision of cancellation or maintenance.[45]

The State Intellectual Property Office of Japan adopted procedures for patent enforcement on December 17, 2001. In addition, on April 26, 2000, Japan enacted the Law on Patent Attorneys (Patent attorney Act Number 49 of 2000). The goal of

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[43] Stefano Clò, Massimo Florio, and Francesco Rentocchini, 'Firm Ownership, Quality of Government and Innovation: Evidence from Patenting in the Telecommunication Industry', *Research Policy*, 49.5 (2020), 103960 https://doi.org/10.1016/j.respol.2020.103960

[44] Marek Jemala, 'Long-Term Research on Technology Innovation in the Form of New Technology Patents', *International Journal of Innovation Studies*, 5.4 (2021), 148–60 https://doi.org/10.1016/j.ijis.2021.09.002

[45] Nikolaos Papageorgiadis and Wolfgang Sofka, 'Patent Enforcement across 51 Countries – Patent Enforcement Index 1998–2017', *Journal of World Business*, 55.4 (2020), 101092 https://doi.org/10.1016/j.jwb.2020.101092

this Act is to establish a system of Patent attorneys and to regulate their activities, so contributing to matters such as the effective protection and promotion of the use of industrial property rights and, in turn, to economic and industrial growth.[46] A Patent attorney will respond to inquiries from third parties, conduct business on behalf of third parties regarding procedures with the Japanese Patent Office relating to Patents, utility models, designs or trademarks, or international applications or international registration applications, and procedures with the Minister of Economy, Trade, and Industry relating to the application of objections or awards relating to Patents, utility models, designs or trademarks, while providing expert advice.[47]

Any individual who does not qualified to become a Patent attorney but registers with the Japan Patent Prosecutors Association by submitting a fake application shall be subject to a maximum one-year jail sentence or a maximum fine of 1,000,000 yen. Antisocial inventions are not patentable. In the event of an invention that falls under the category of inventions that cannot be patented, the innovation may not receive a patent despite meeting the standards, such as industrial applicability, novelty, and the presence of an inventive step. The range of innovations that cannot be patented is becoming ever more restricted. Previously, food, drinks, medicinal items, chemical compounds, and nuclear transmutation materials were not patentable. Nonetheless, it is currently classified as an innovation that cannot be patented and is confined to the restrictions of Article 32 of the Patent Law (The Intellectual Property Basic Act) No. 122 of December 4, 2002 (as modified by Law No. 119 of July 7, 2003). A patent may only be obtained by manufacturing an innovation. Instead, he must file an application to the Japanese Patent Office for his innovation. (JPO). The right to acquire a patent for an invention belongs to the inventor. An investor's entitlement to get a patent may be transferred to another party. It does not matter for an individual to apply, but associations or unions cannot make an application on his behalf. Applicants who are not yet of legal age cannot continue to submit their applications and must be accompanied by legal guardians (often parents) to complete the application process.[48]

Apple, the plaintiff, vs Samsung Electronics, the defendant is one case. Tokyo District Court, Tokyo District Court, approved Apple's complaint on August 23, 2011. The subject of the issue is a Galaxy S, Galaxy S II, or Galaxy Tab 7 bearing a

[46] Mark P. Hampton and Julia Jeyacheya, 'Power, Ownership and Tourism in Small Islands: Evidence from Indonesia', *World Development*, 70 (2015), 481–95 https://doi.org/10.1016/j.worlddev.2014.12.007

[47] Manuel Baumann and others, 'Comparative Patent Analysis for the Identification of Global Research Trends for the Case of Battery Storage, Hydrogen and Bioenergy', *Technological Forecasting and Social Change*, 165.December 2020 (2021) https://doi.org/10.1016/j.techfore.2020.120505

[48] Qing Ye and others, 'How Publications and Patents Are Contributing to the Development of Municipal Solid Waste Management: Viewing the UN Sustainable Development Goals as Ground Zero', *Journal of Environmental Management*, 325.PB (2023), 116496 https://doi.org/10.1016/j.jenvman.2022.116496

patent. Apple is suing for the right of claim in the form of a Patent infringement, and the content of the claim is to halt sales in Patent infringement and for the court to make a temporary order to prohibit the sale of the allegedly infringing goods. District Court of Tokyo, 17 June 2011. Apple, when the application disposition: 1) Target Products: Galaxy S and Galaxy Tab; 2) Legal Claim: Patent Infringement; 3) Request Body: Temporary Stop Sale Order. District Court of Tokyo, April 22, 2011. Samsung Electronics has filed a lawsuit: 1) Product Patent Violation; 2) Claim Rights: Data Division Transfer and Power Control, Including Wireless Data Communication, the Following 2 Patents: JP4299270, JP4642898; 3) Content Requests: Patent Violation and (2) Suspended Sales Orders. On 17 October 2011. Samsung Electronics, disposition of the provisional application: 1) Target Products: iPhone 4, iPhone 4S, iPad 2; 2) right of claim: communication-related to 1 Patent and user interface linked to the right of claim; 3) the terms of the request: temporary suspension of sales.[49]

In April 2011, Apple ultimately returned to Japan with identical expectations. Apple is attempting to persuade a Japanese court to ban various Samsung Galaxy Series devices in the country. The primary issue is the similarities between Galaxy Series smartphones and tablets running the Android operating system and Apple's iPhone and iPad. Apple had filed a lawsuit in a court in Tokyo. The complaint demanded the cessation of sales of the Galaxy S, the Galaxy S II, and the Galaxy Tab 7 in Japan. Apple continues to attempt to slow the rate of Galaxy Series sales. As the most formidable rival to the iPhone and iPad, the Galaxy Series is a special worry for Apple; nevertheless, Apple is insufficient to launch a patent infringement action in a single nation. A Tokyo court has found that Samsung Electronics does not violate Apple's patents. This triumph demonstrates that judges in California will only sometimes follow the verdict of a United States jury.[50] A Tokyo judge concluded on August 31, 2012, one week after the U.S. ruling, that Samsung smartphones and tablet computers did not infringe Apple's conclusions about the synchronization of music video data with servers. In addition, the court president stated that Samsung's goods did not appear to employ the same technology as Apple's. Thus, Samsung was ultimately granted permission to sell its products on the territory of the country of Sakura. In accordance with the Japanese Patent Law, the judge's ruling specifically identifies software connected to computer programs as patentable. According to the Japanese Patent Act, an innovation is "the creation of a technically sophisticated idea of a natural nature." This means that patent

[49] Takashi Miyazawa and Hiroshi Osada, 'Change of Claim Structures of Market Leaders' Japanese Published Unexamined Patent Applications According to the Degree of Technology Maturity', *World Patent Information*, 33.2 (2011), 180–87 https://doi.org/10.1016/j.wpi.2011.01.007

[50] Stefano Cipollari and others, 'Long-Term Effectiveness of the Zilver PTX Drug-Eluting Stent for Femoropopliteal Peripheral Artery Disease in Patients with No Patent Tibial Runoff Vessels—Results from the Zilver PTX Japan Post-Market Surveillance Study', *Journal of Vascular and Interventional Radiology*, 29.1 (2018), 9-17.e1 https://doi.org/10.1016/j.jvir.2017.08.014

protection is only available for linked computer programs that can be considered "natural technical idea creations".[51]

Japan, which safeguards software, demonstrates greater foresight. The world of Information and Communication Technology (ICT) is now a must for modern advancement, thus there will be an increase in the number of inventions in this sector in the future. Having provided with so many discoveries in this industry, it is necessary to offer legal protection to inventors in order to safeguard their property rights. In addition, public rights are preserved by the granting of exclusive rights to inventors and the maintenance of public order in regards to the use of other people's innovations. The community also feels secure working and using the work of others according to the rules and avoiding patent infringers such as pirated goods.[52] By accommodating legal interests via continuous and rigorous law enforcement, this rule will produce a just, successful, and wealthy society.

According to the Japanese Patent Law, software relating to computer programs is one of the patentable innovations. According to the Japanese Patent Act, an innovation is "the creation of a technically sophisticated idea of a natural nature." This means that only computer-related software that may be regarded a "natural technical idea creation" is eligible for patent protection. The rules of the Japanese Patent Office (JPO) specify that when "information processed by software is concretely realized using hardware resources," the software is regarded as "a creation of a technical idea employing natural laws." In other words, patent protection will not be awarded for associated software inventions if information processed by software is not implemented utilizing hardware resources.[53] Currently, the Japanese Patent Office (JPO) promotes the adoption of a multiclaim system since it will be more effective in accommodating the scope of rights that inventors seek to include in their innovations on a case-by-case basis. The Japanese Patent Office (JPO) recognizes multiple system and subsystem, method, and apparatus claims (substantially the same invention). Multiple claims were designed to ensure broader protection for patentable ideas that were not anticipated by the previous art, despite the fact that Japan initially favoured single claims.

According to the Japanese Patent rule, an innovation is a technically sophisticated production that utilizes a natural rule. Natural law is a scientific body of law derived from observations of nature. The Patent Law (The Intellectual Property Basic Act) Number 122 of December 4, 2002, as modified, does not recognize as an invention anything that does not take use of natural law, such as

[51] Keishiro Hara and others, 'Historical Development of Wastewater and Sewage Sludge Treatment Technologies in Japan – An Analysis of Patent Data from the Past 50 Years', *Environmental Development*, 19 (2016), 59–69 https://doi.org/10.1016/j.envdev.2016.05.001

[52] Hiroyasu Inoue, Wataru Souma, and Schumpeter Tamada, 'Analysis of Cooperative Research and Development Networks on Japanese Patents', *Journal of Informetrics*, 4.1 (2010), 89–96 https://doi.org/10.1016/j.joi.2009.09.002

[53] Teiji Akagi and others, 'Resolution of Migraine With Aura After Transcatheter Patent Foramen Ovale Closure: Prospective Evaluation in Japanese Population', *Journal of the American College of Cardiology*, 71.11 (2018), A601 https://doi.org/10.1016/s0735-1097(18)31142-2

gaming rules or trade methods, or something that is opposed to the natural law of continuous motion. By Law No. 119, issued July 16, 2003). A patented innovation must be a completely new creation that has never existed before, because granting a patent for a widely known invention will bring a negative impact. A Patent will not be granted for an invention that lacks an element of novelty, according the Patent Law, "widely known" refers, in general, to public knowledge. Similarly, an invention is considered to contain an inventive step if a person with relevant expertise in a technical field linked to the invention (or an expert in the field) can make the invention rapidly.[54] In the case of software, the Japanese Patent Law offers legal protection for inventions in the Information and Communication Technology industry. The judge decided that Samsung's smartphones and tablet computers did not breach Apple's conclusions about the synchronization of audio and video data with servers. Patent law offers protection for software in Japan. Legal protection attempts to foster inventions by encouraging their protection and use so that they can contribute to the growth and expansion of the industry.[55]

The subject of patent law protection is specifically the protection of technical conceptions with high degrees of inventiveness. The term "intellectual" as used in this Act refers to inventions, devices, new varieties of plants, designs, works, and other properties produced through human creative activity (including discovering or solving natural laws or natural phenomena applied to the industry), marks trade names, trade names and other signs used to indicate goods or services in the course of business activities, and trade secrets and other technical or valuable business information for business purposes. Legal protection for software is intended to encourage innovation. The presence of legal protection for software, which is a component of Information and Communication Technology (ICT), would boost the Japanese economy and have an effect on the prosperity of the Japanese people.[56]

Since patent protection in Japan provides protection for new innovations, including computer software and AI, the authors have constructed a narrative up above that suggests protecting AI in Japan can be performed through patents. This is due to the fact that patent protection in Japan provides protection for new innovations. Discussing new innovations within the realm of Japanese patent rights encompasses a very broad range of activities, some of which are creative human endeavours aimed at having economic values. The values can be utilized by the inventor or patent owner himself, and it can also contribute to the industry's growth and expansion. Hence, creative human endeavours that generate economic

[54] Toshinao Yamazaki, 'Patent Prosecution Highways (PPHs): Their First Five Years and Recent Developments Seen from Japan', *World Patent Information*, 34.4 (2012), 279–83 https://doi.org/10.1016/j.wpi.2012.07.001

[55] Marlinang Diarta Siburian and others, 'The Progression of Clinical Trials in Indonesia: An Observational Study of Records from Clinical Trial Registries Databases', *Global Health Journal*, 4.3 (2020), 87–95 https://doi.org/10.1016/j.glohj.2020.08.003

[56] Mahmut Yasar and Roderick M. Rejesus, 'International Linkages, Technology Transfer, and the Skilled Labor Wage Share: Evidence from Plant-Level Data in Indonesia', *World Development*, 128 (2020), 104847 https://doi.org/10.1016/j.worlddev.2019.104847

value and contribute to the growth of industry in Japan can be protected through patents so long as there are such endeavours.[57]

The Impact of Artificial Intelligence on Patents Indonesia and Japan

This view, shared by Posner, that protecting artificial intelligence through the patent system has the potential to have a positive effect on the economy is supported by the evidence. It is common knowledge that the application of Economic Analysis to Law, which was pioneered by Posner, is the evolution of utilitarianism, with its figures Jeremy Bentham and John Stuart Mill. This theory of utility places an emphasis on the fundamental idea that something should be beneficial. Hence, something must offer advantages (the value of utility) to other things (social welfare).[58] In its development, after being re-analysed by Ronald Coasei (1960) and Posner, the idea of economic analysis in law developed to encompass transaction cost of economy, economic institution, and public choice. The efficiency of legal regulations, which are most frequently associated with private law, is related to the transaction costs of the economy. Economics Institution relates to human actions including formal legal laws, informal customs, traditions and social rules. And the concept of public choice refers to the process of making decisions democratically by taking into account various microeconomic and commercial practises. Posner has high hopes that the application of economic concepts can improve the effectiveness of the legal system, especially the effectiveness of law in enhancing social welfare.[59]

However, the inclusion of Wealth Maximization as an embodiment of the theory of Economic Analysis in Law is the masterstroke in the research on the application of economic analysis to law. At this point, Posner zeroes in on the specific applications of the efficiency principle. Posner understands efficiency in this context to be a scenario in which resources are distributed in such a way as to provide the most possible value. In the context of social decision making on the regulation of public welfare, the concept of efficiency in this context places an emphasis on ethical principles as the primary consideration.[60]

AI has had a significant impact on various aspects of the economy, including patent systems. Indonesia and Japan are two countries that have implemented policies and regulations regarding AI and patents. In this article, the authors will discuss the impact of AI on patents in Indonesia and Japan. In Indonesia, the

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[57]Theresa F. Rambaran, 'A Patent Review of Polyphenol Nano-Formulations and Their Commercialization', *Trends in Food Science and Technology*, 120.December 2021 (2022), 111–22 https://doi.org/10.1016/j.tifs.2022.01.011

[58] Jeferson Kameo and Teguh Prasetyo, 'Hakikat Hukum Ekonomi (Internasional) Dalam Perspektif Teori Keadilan Bermartabat', *Jurnal Hukum Ius Quia Iustum*, 27.2 (2020), 308–27 https://doi.org/10.20885/iustum.vol27.iss2.art5

[59] Bambang Ali Kusumo and others, 'Rethinking Criminal Law Policies in Taxation to Overcome Tax Violations', *Bestuur*, 10.2 (2022), 159–82 https://doi.org/https://dx.doi.org/10.20961/bestuur.v10i2.62064

[60] Khudzaifah Dimyati and others, 'Indonesia as a Legal Welfare State: A Prophetic-Transcendental Basis', *Heliyon*, 7.8 (2021), e07865 https://doi.org/10.1016/j.heliyon.2021.e07865

Directorate General of Intellectual Property (DGIP) has been working to modernize its patent system and incorporate AI into the process. The DGIP has introduced an AI-based system to help process patent applications faster and more accurately. This system can also assist with patent searches, which can help patent examiners identify existing patents and reduce the risk of patent infringement.[61] However, there are concerns about the potential impact of AI on patenting processes in Indonesia. Some experts worry that AI could reduce the need for human patent examiners, potentially leading to job losses. Additionally, there is a risk that AI-generated patents could be utilized to create monopolies or unfairly restrict competition.[62]

Japan has been at the forefront of AI research and development for several years, and the Japanese patent system has been adapting to these changes. The Japan Patent Office (JPO) has introduced an AI-based system to help patent examiners with the examination process.[63] This system uses machine learning algorithms to analyse patent documents and identify prior art, which can help examiners make more informed decisions about patent applications.[64]

Besides, Japan has also introduced the "IP Acceleration Program," which aims to promote innovation and speed up the patent application process. The program includes support for start-ups and small and medium-sized enterprises (SMEs) that are developing AI-related technologies.[65] However, there are also concerns about the potential impact of AI on patents in Japan. For example, there is a risk that AI-generated inventions could be patented without proper consideration of ethical or social implications. Additionally, there is a risk that AI could be utilized to automate the patent filing process, potentially leading to a flood of low-quality patents.[66] The impact of AI on patents in Indonesia and Japan is complex and multifaceted. While there are clear benefits to using AI in the patent process, there are also risks that need to be carefully considered. To ensure that AI is used to promote innovation and protect intellectual property, it is essential that

[61] Novianty Helitha Muchtar, Miranda Risang Ayu Palar, and Muhamad Amirulloh, 'Development of a Valuation System of Technology for the Enhancement of Innovation in Indonesia', *Heliyon*, 9.2 (2023), e13124 https://doi.org/10.1016/j.heliyon.2023.e13124

[62] Gonenc Gurkaynak, Ilay Yilmaz, and Gunes Haksever, 'Stifling Artificial Intelligence: Human Perils', *Computer Law and Security Review*, 32.5 (2016), 749–58 https://doi.org/10.1016/j.clsr.2016.05.003

[63] Yogesh K. Dwivedi and others, 'Artificial Intelligence (AI): Multidisciplinary Perspectives on Emerging Challenges, Opportunities, and Agenda for Research, Practice and Policy', *International Journal of Information Management*, 57.August 2019 (2021), 101994 https://doi.org/10.1016/j.ijinfomgt.2019.08.002

[64] Olesya Dudnik and others, 'Trends, Impacts, and Prospects for Implementing Artificial Intelligence Technologies in the Energy Industry: The Implication of Open Innovation', *Journal of Open Innovation: Technology, Market, and Complexity*, 7.2 (2021), 155 https://doi.org/10.3390/joitmc7020155

[65] Fujii and Managi.

[66] Garikai Chimuka, 'Impact of Artificial Intelligence on Patent Law. Towards a New Analytical Framework – [the Multi-Level Model]', *World Patent Information*, 59.October (2019), 101926 https://doi.org/10.1016/j.wpi.2019.101926

policymakers and stakeholders work together to develop effective policies and regulations that balance both the benefits and risks of AI.

4. Conclusion

The regulation of artificial intelligence (AI) protection in intellectual property rights in Indonesia has not been accommodated yet in the Indonesian national legal system. However, the most possible method for AI protection can be performed through copyright. Another case is that AI protection through copyright still has shortcomings as it is only considered the same as ordinary computer software in general, which should have a significant difference. AI protection space in Japan can be accommodated through patents, provided that the AI in question contains the elements or categories that can be protected through Japanese patents. Japan is a country that does not have specific regulations regarding AI protection as part of its national intellectual property rights. AI protection as a patent right has, in point of fact, highly complicated and varied effects in both Indonesia and Japan. The use of AI in the process of obtaining a patent comes with a number of dangers that must be carefully evaluated despite the fact that there are obvious benefits associated with its use. Policymakers and stakeholders need to collaborate on the development of effective policies and regulations that strike a balance between the benefits and risks of AI. This will finally ensure that AI is utilized to foster innovation and protect intellectual property.

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