National Legal Protection Of Artificial Intelligence And Robots In The Era Of Industrial Revolution 4.0 And Society 5.0

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Absract. In the era of revolution 4.0 and society 5.0, the use of artificial intelligence technology and robots is growing very fast which results in competitive changes. This artificial intelligence and robots are something that can make it easier for us as humans to carry out various kinds of activities and work. The presence of artificial intelligence technology and robots raises the issue of whether there is an urgency of national legal protection arrangements in Indonesia. The creation of this scientific article for some intellectual property rights in patent law and arrangements regarding aspects of the substance that exists in legal regulations. The creation of this scientific article aims to understand the substantial aspects contained in legal regulations and patent law regarding artificial intelligence technology and robots in Indonesia.

Keywords: artificial intelligence, robotic, legal regulation

1 Introduction

Along with the times, accompanied by the growth and development of science, strengthening the quality of human resources, and technological innovation, the world over the past few centuries has experienced extraordinary developments in the field of technology, known as the industrial revolution.[1] The industrial revolution was the starting point of change in human civilization which has changed the face of the world to become more advanced and modern.[1] This era also gave birth incorporation of new skills and technology. This can be called artificial intelligence (AI). Artificial Intelligence (AI) is a term used to model intelligent behavior and critical thinking comparable to human using computers and technology. Artificial intelligence is perhaps the oldest and broadest field of computer science, which imitates human cognitive functions used to solve problems, by learning and thinking like humans. AI is now raising immense interest due to its success in machine learning.[2] Artificial intelligence is also a field of study and design of intelligent agents, where

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intelligent agents are systems that understand the environment and take steps to maximize the chances of success.

Aside from schooling, artificial intelligence can be utilized to enhance human resources. The emergence of artificial intelligence does not imply that humans are being replaced by AI, but rather that AI can help humanity develop potential that artificial intelligence cannot.[3] Everyone possesses qualities or potential that, if developed further, could lead to greater advancement. Having quality human resources will make it easier for them, and even us, to use existing technology effectively. This is an extremely intriguing topic. Because you can discover the other side of artificial intelligence.[4] The challenge is formulated around the importance of artificial intelligence in the period of industrial revolution 4.0.[5]

Indonesia is one of the countries that uses the principle of legality in determining and making written laws that will regulate human life.[6] With the presence of the development of robots in the international world in industrial development, it has also had a big effect on Indonesia in using robots to replace the role of humans in the industrial and health sectors. In the world of education in Indonesia, robots have also succeeded in entering school security, such as CCTV which is a basic robot that cannot move or speak, but has a program to obey commands to store all the memories it sees. Moreover, using a smartphone with assistant mode in it is also one of the functions of an automatic robot to manage all academics' schedules and replace the role of secretaries in their daily lives. Based on data from the International Federation of Robotics (IFR), the use of robots in 2020 has reached three million units or has tripled in the last 10 years. [7]

Even in developed countries, robot development is constantly being updated towards perfection as a form of a country's presence in limiting the use of robots, which is critical to human safety, but this does not rule out the possibility of crimes being committed by these robots in the future, because the society 5.0 revolution will change.[8] The future of people, which results in law, can be jeopardized by increasingly rapid technology advances. This highlights the need of protecting product findings connected to artificial intelligence and robots. There is something known as patent legal protection.

Patents are a legal tool that protects intellectual property in the sphere of technology and serves as a measure of a country's progress. Patents are exclusive rights awarded by the state to inventors for technological inventions. Patent protection is limited to the jurisdiction given and is territorial, which means that a patent only protects what is claimed and the area where it is granted.

The Paris Convention for the Protection of Industrial Property (Paris Convention) establishes the scope of industrial property as patents, utility models, industrial designs, trademarks, service marks, trade names, indications of source or designations of origin, and repression of unfair competition. In addition, the Patent Cooperation Treaty (PCT) and Trade-Related Aspects of Intellectual Property Rights (TRIPS) govern worldwide patent registration.

According to Article 27 paragraph 1 of the Trade-Related Aspects of Intellectual Property Rights (TRIPS), any invention that takes the form of a product or process in any field of technology is eligible for patent protection, provided that the technology or invention is still novel, incorporates an inventive step, and can be used in industry. As long as the technology is still novel and contains innovative steps that can be used in industry, patents can protect every area of technology that is constantly evolving each year.

2 Method

2.1 Types of research

This legal research employs normative and comparative research methods. Normative legal research focuses on applicable norms and explores these legal standards by reviewing secondary data as well as primary and tertiary data. Meanwhile, comparative research is defined as research that seeks to determine whether or not two or more variables are comparable to the topic under study.

This research uses empirical data as supporting data. This research uses Indonesian positive law as a whole with a comparison of the positive law of the US and Japan, other legal materials which include research on legal principles, legal history and comparative law. Therefore, this research is focused on library research, which means that it will examine and examine more secondary data obtained from research. The approach used is a statutory approach (Statute Approach) with a focus on using Law Number 13 of 2016 concerning Patents accompanied by legal comparisons. US state patents (Patent Act 35 US Code) and Japanese patent law (特許法Tokkyohō). A normative research must have a legislative method because many legal regulations will be examined, which will be the research's emphasis and core issue. Then, this research data was obtained from laws developing in Indonesia that are related to cybernetic problems21 to predict future situations based on assumptions about the relationship between the environment and society, which is expected to occur if policymakers do not intervene to change the course of events.

Research Approach

The approach used in this thesis research is socio-legal research, which is an approach to the object to be studied in the form of the development of robots in the world that are capable of changing the social habits of Indonesian society, thereby making robots a new problem for cultural development in Indonesia as viewed through benchmarks. This is discussed in Chapter 3 of this study. This legal research employs normative and comparative research methods. Normative legal research focuses on and explores relevant legal standards. The legislative approach is carried out by analyzing all laws and regulations deemed to be connected to the development of robots in Indonesia and requiring the regulation of robots and humans to be regulated in line with the legal concerns under consideration. The legislative method relies on laws and rules.

The sociological juridical approach is used to understand legal aspects in practice in the field, particularly their role in controlling or supervising community behavior, whereas the futuristic approach focuses on futuristic forecasting, which is the art and science of predicting events that may occur in the future. By looking at existing conditions that will evolve swiftly in the future, this technique is used to study legal notions that must develop following the flow of technology based on social factors in society., which will show various possible risks that can occur due to interactions between humans and robots resulting in the law that regulates human control with robots in the society 5.0 revolution while still prioritizing the values regulated by ratifying the main instruments for protecting human rights. 24 As a form of protecting human rights when human rights begin to be disturbed and taken over by robots.

2.2 Object of research

The research object of this thesis is legal protection for artificial intelligence inventions, and the findings will explain legal protection for artificial intelligence inventions through a comparison of laws in the United States and Japan, as well as an examination of the regulatory model for artificial intelligence (Artificial Intelligence). With Lawrence Lessig's sad dot theory and Shlomit's 3A (Advanced, Automated, and Autonomous) patent law concept. Aside from that, the development of robot technology is already present and embedded in society by using current events as reference material for researchers when collecting data from various sources such as document/library studies, observations, and interviews.

These steps are to determine interdisciplinary principles in the development of knowledge that circulates into legal determinism in society to find a correct and comprehensive understanding of the matters that are the focus of research by using prospective legal aspects that are intentionally placed in the classification of future legal events while still applying social values that are present in society from time to time.

2.3 Sources of Legal Materials

Legal materials can be divided into 3 (three), namely primary legal materials, secondary legal materials, and tertiary legal materials. This writing uses normative legal research so that the author uses legal materials:

a. Primary legal materials include statutory rules, official records, legislative minutes, and judicial decisions. 5 The primary legal materials used in this research are statutory regulations, which include the 1945 Constitution, Law-Law Number 1 of 2009 concerning Aviation, Regulation of the Minister of Transportation Number PM 180 of 2015 concerning Control of the Operation of Unmanned Aircraft Systems in Airspace Served by Indonesia, and Regulation of the Minister of Transportation Number PM 47 of 2016 concerning Amendments to Regulation of the Minister of Transportation Number PM 180.Law No. 13 of 2016 on patent rights, the Patent Act 35 US Code, 特許法Tokkyohō, and the Trade

Related Aspects of Intellectual Property Rights (TRIPs) Agreement are the other main legal materials.

b. Secondary legal materials include works on legal science and the perspectives of expert legal scholars. 6 "In this study, secondary legal materials included scientific books in the field of law, legal papers, journals, legal science, and legal scientific publications. In addition to secondary legal materials, there is various literature on Intellectual Property Rights, Patents, the Industrial Revolution, Artificial Intelligence (Artificial Intelligence), various literature issued by the Directorate General of Intellectual Property Rights (DJKI), various literature issued by the World Intellectual Property Organization (WIPO), various seminar conclusions, and other scientific

c. Tertiary legal materials are those that offer instructions, explanations, and reinforcement for primary and secondary legal texts. The Indonesian Dictionary and the Internet were employed in this research as tertiary legal materials. Supporting legal resources are those that provide instructions and explanations for main and secondary legal documents, such as dictionaries, magazines, journals, newspapers, and websites, to supplement or support research data.

2.4 Method of collecting data

The legal material collection technique aims to get legal material for research. The technique for gathering legal documents that support and relate to the presentation of this research is literature review. A literature review was conducted to obtain secondary data by reviewing statutory regulations, literature, and the works of legal experts relevant to this inquiry. Aside than that, the data was collected using the library research approach. Library research is a sort of research that uses document study tools to examine secondary legal materials. First and foremost, the researcher will collect all applicable regulations for the research object. Furthermore, from these materials, the researcher will select the concepts and doctrines of intellectual property rights (IPR), particularly patents.

2.5 Analysis Method

The data from this study was processed and evaluated descriptively qualitatively, which means that all of the data was examined in its entirety to produce a systematic and factual image. Following analysis, the author uses a deductive thinking process, which is a pattern of thinking that begins with basic matters and then progresses to specific findings.

3 Results And Discussion

Professor Klaus Schwab created the concept of industrial revolution 4.0. He is a well-known German economist and the creator of the World Economic Forum (WEF), who declared in his book, The Fourth Industrial Revolution, that the industrial revolution 4.0 has the potential to radically alter how we live, work, and interact with one another. The creation of good information, along with

cutting-edge technology, generates a new intellect. The advent of this new intelligence undoubtedly makes life easier for humans in all of their activities and industries.[9]

Aside from assisting humans in all tasks and fields, artificial intelligence can also be utilized to enhance existing human resources. AI can be utilized to train skills and hone the potential that each individual possesses.[10] These people must also grasp why they need to be capable of using artificial intelligence. Because their ability to deploy artificial intelligence enables them to survive in the face of technological and information advancements. Understanding the application and benefits of AI can raise an individual's value. Workers and employees will be recognized as capable of competing in the period of industrial revolution 4.0.[11] Meanwhile, those who are still in school might begin studying it immediately. As a result, his comprehension expands and he becomes one of the high-quality HR assets of others.

3.1 Era of Industrial Revolution 4.0

Challenges during the Industrial Revolution must be addressed. Some of the obstacles that must be addressed in the Industrial Revolution Era 4.0 include information security concerns, manufacturing machinery that must be stable, insufficient skills, resistance to change, and a significant drop in employment due to automation. Education should serve as a bridge between students and the workforce, producing outstanding human resources. Selecting learning strategies can help to predict insufficient skills.[12] Skills can be learned from a young age. Schools' learning techniques are expected to prepare pupils for the Fourth Industrial Revolution. The Era of Industrial Revolution 4.0 focuses not only on providing support facilities, but also on preparing Indonesian education to be more advanced, catch up with industrialized countries, and adapt to the Era of Industrial Revolution 4.0.[13]

3.2 Scope of Artificial Intelligence (Artificial Intelligence)

Examining artificial intelligence inventions. The author of Law Number 13 of 2016 concerning Patents utilizes the word computer program to define artificial intelligence inventions. A patent is an exclusive right awarded by the state to an inventor for the results of his creation in the field of technology for a set amount of time to carry out the invention himself or grant permission to another party to implement it. And an invention is an inventor's idea articulated in a specific problem-solving action in the realm of technology, such as the creation of a product or process, or the enhancement and development of a product or process. The scope of patent protection is separated into two parts, as mentioned in Articles 2 and 3 of Law Number 13. Patents are simply issued to innovations that are novel, contain an inventive step, and can be implemented in industry. Simple patents are issued for any new invention, development of an existing product, or procedure that can be used in the industry.[14]

Patent protection is primarily focused on technology-related inventions, according to the definition of patents mentioned in Article 1 paragraph (1) of Law Number 13 of 2016. According to the definition of invention in Article 1 paragraph 2 of Law Number 13 of 2016 about Patents, products

are the scope of the invention type, as well as improvements and development of these items or processes. In this situation, artificial intelligence inventions are considered software product patents. Because the invention of artificial intelligence (AI) is a software-based physical device that works with a variety of current operating systems. Computer programs contain inventions relevant to artificial intelligence. A computer program must have character (instructions), technical ramifications, and the ability to solve both tangible and intangible problems in order to be eligible for patent protection. According to the explanation in Article 4 letter (d) of Law Number 13 of 2016, this innovation is patentable.

Intelligence Invention

Artificial (Artificial Intelligence) as a Patent Object

Based on the explanation of Article 4 letter (d) of Law Number 13 of 2016 concerning Patents. Artificial intelligence inventions which are part of computer programs can become patent objects in Indonesia by following the computer program provisions regulated in Law Number 13 of 2016 concerning Patents in the form of computer programs or algorithms only, both computer programs and algorithms must be has techniques characteristic of artificial intelligence (Artificial Intelligence) to be called ideal artificial intelligence technology (Artificial Intelligence) or technology based on artificial intelligence (Artificial Intelligence).

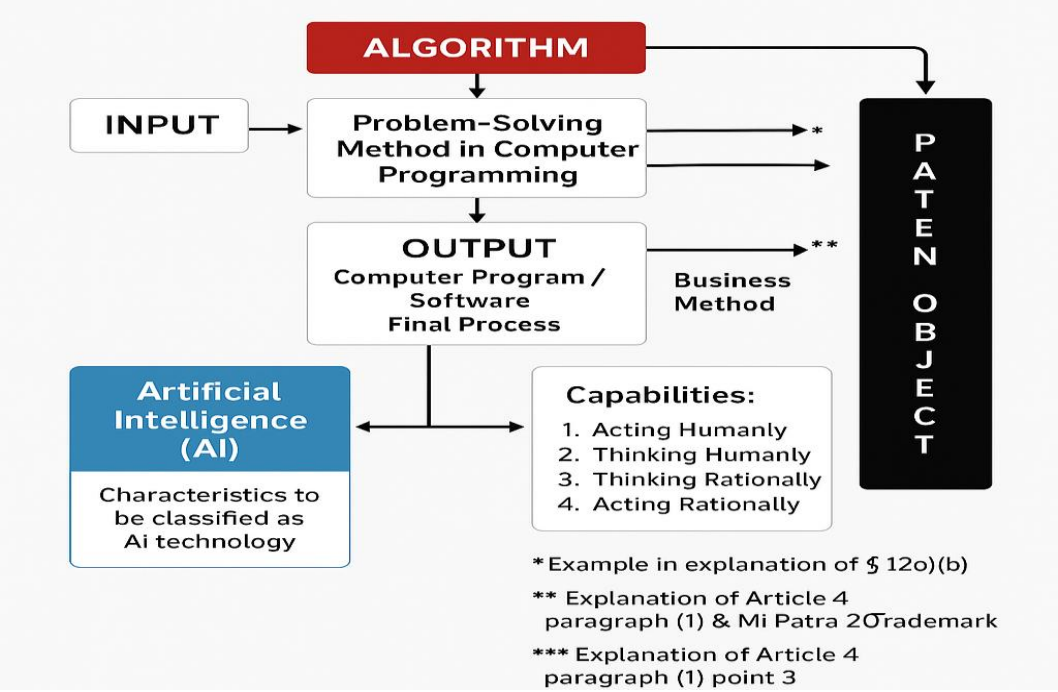


Figure 1. Patent Objects on Artificial Intelligence

Based on the image above, it explains that a computer program technology generally has elements in the form of Algorithms, Programming Languages and Programs, if a computer program technology wants to be called Artificial Intelligence then the Algorithm and/or program output must have at least several techniques and the abilities possessed by an artificial intelligence (Artificial Intelligence).

3.3 Comparison of Artificial Intelligence Invention Studies between Indonesian Patent Law and US Patent Law and Japanese Patent Law.

The author conducted research on artificial intelligence inventions, specifically patent laws in other countries, in order to provide a comparison of positive law related to artificial intelligence inventions and to investigate the role of patent examiners in other countries in examining artificial intelligence technology.

inventions.

The author chose the United States and Japan as comparison countries for the study of positive law and the role of patent examiners because the United States is a developed country on the western continent, and Japan is a developed country on the Asian continent, both of which have patent applications.

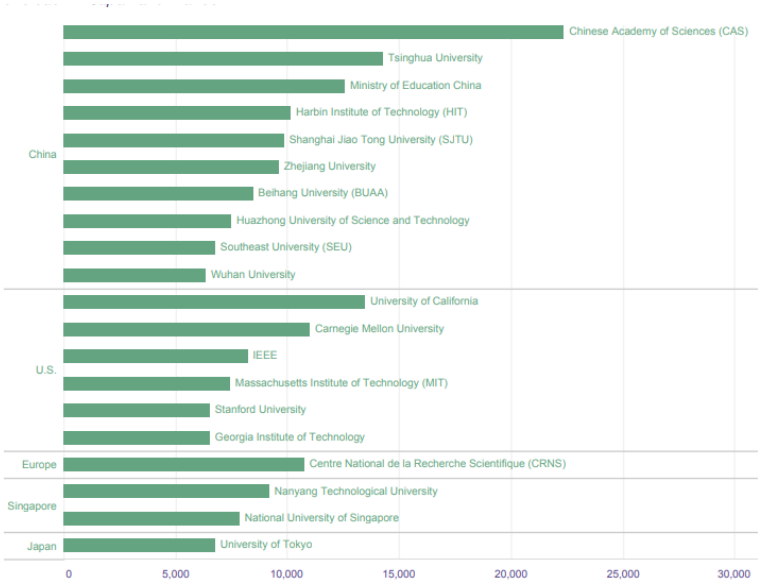


Figure 2. Number of Patents by Patent Office for 20 identified Artificial Intelligence (AI) Application Fields

The US Patent Law does not include artificial intelligence technology as a protected innovation. Instead, it lists computer programs in the patent fee section (35 USC41 and AIA § 14) without explaining how they were produced. However, on April 27, 2020, the United States Patent and Trademark Office (USPTO) confirmed that artificial intelligence technology is not an inventor under US Patent Law in case ruling No. 16/524,350.

Article 2 of Act No. 109 of 2006, often known as the Japanese Patent Law, contains provisions pertaining to inventions, namely computer programs. It consists of a single article and four paragraphs. Only computer programs are mentioned in US patent law; Japanese patent law contains provisions on computer programs and explains them in the article's contents; and Indonesian patent law contains provisions on computer programs, but with an explanation in the attached page.

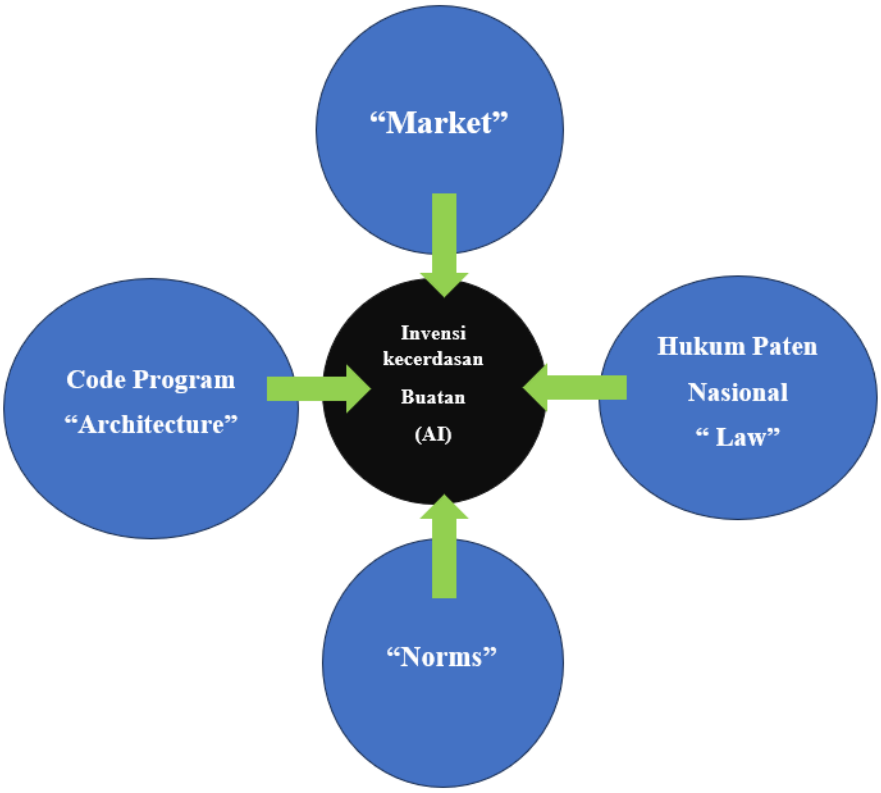
Even if a country's patent law lacks or includes specific or non-specific provisions regarding the name of the most recent technological invention, this does not prevent a new technology from obtaining patent protection as long as the invention meets the substantive requirements for patent protection.

3.4 Artificial Intelligence Technology Protection Model

Law and technology have a critical role in forming and directing human life in the Eras of the Fourth Industrial Revolution and the Fifth Society. Human life in this era is heavily reliant on technology to facilitate all aspects of daily life. Technology alters our perceptions of time and space, as well as our language. By analyzing diverse relationships between humans and technology, Ihde demonstrates that these relationships are not neutral. However, Ihde believes that the non-neutral interaction with technology is still poor, and that the existential link between humans and technology is more important.This suggests that technology has had an impact on human direction and aspirations, albeit not entirely because the interaction between humans and technology is never comprehensive. Human life can be experienced without the use of technology. Because it is not complete, the relationship between humans and technology has variances.

Artificial intelligence technology inventions (Artificial Intelligence), which are constantly developed each year, will finally attain the form envisioned by their designers. The ideal form of artificial intelligence technology inventions (Artificial Intelligence) is similar to a droid robot that has the visual shape of a human and the intelligence to think and act like a human, as represented in different works of science fiction. If this ideal shape is reached in the future, the innovation may evolve into a technical subject that mimics a human subject, with varied affects on humans.

Moreover, artificial intelligence inventions which have components with technical characteristics that resemble humans can give rise to differences of opinion in society regarding these



inventions.[15]

Figure 3. Study of AI Inventions with Pathetic Dot Theory

These four forces work together to curb mobility while also protecting AI-powered inventions. In addition to providing protection against AI advancements, these four powers can be used to anticipate and avoid the potentially negative repercussions of AI innovations, particularly those with a significant impact on society.[16] Artificial intelligence (AI) technology is always growing until it achieves skills that are increasingly comparable to what a human should be able to perform (Program Code as Architecture).

Patent law protects the authors of artificial intelligence inventions, allowing them to be used ethically and commercially. the role that society plays in determining the fairness of an annual

technological advancement (Social Norms).[17] Investors in technology who work with inventors to develop new technological advances.Artificial intelligence inventions governed by the four forces outlined in the pathetic dot theory can serve as a model for protecting AI inventions and establishing a harmonious relationship between technology and the law, particularly cutting-edge technology, so that society benefits from its use while the creator's rights are protected.[18].

3.5 Robot Development in the International World

Robots are capable of carrying out complex and automatic actions that have been programmed by computers as machines that are capable of resembling humans and replicating certain human movements and functions automatically. Robots have also been regulated in robot health care, the law or regulations have been regulated by:[19].

a) Council Directive 93/42/EEC concerning medical devices (as amended by Directive 2007/47/EC) (“Medical Device Directive”);
b) Council Directive 90/385/EEC on the approximation of the laws of the Member States relating to active implantable medical devices (“AIMDD”).

An AIMDD is a medical device that functions using electrical energy (or any power source) and is designed to be placed in whole or in part, either medically or surgically, and to remain in place after surgery. However, the standards committee has not developed any specific safety criteria for robotic prostheses, and AIMDD does not impose any specific restrictions on them. It is slightly more challenging to categorize and govern care robots.

The nature of automation performed by robots through eye contact or physically with humans might result in various interactions with each use, because user reactions cannot be foreseen one by one. Each user's needs are undoubtedly unique, and this is one of the primary elements contributing to the possible danger experienced by users as a result of damage to their robot. As a result, in addition to safety standards, technological restrictions for robots must be regulated in order to protect human users. Even though robots are currently evolving swiftly, it appears that robots were overlooked during their development from 2000 to 2016, as a result of the public, government, and international organizations' lack of interest in robot development. It turns out that robots are currently widely used across multiple continents and geographic regions. The largest user of robots. The author received the following data:

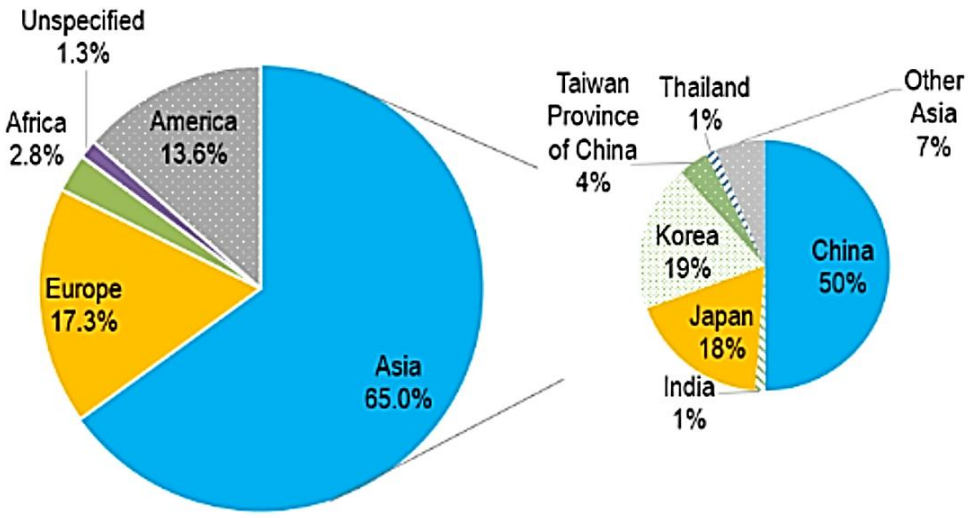


Figure 4. Robot use statistics across continents

Based on this data, it is obvious that the Asian continent has the most robot users, at 65 percent, with a total of 10,000 robot workers. Based on these findings, it appears that robots have displaced people in a variety of domains. Robots are utilized to replace human workers because they are inexpensive and capable of performing difficult tasks that humans cannot.

3.6 Changes and social consequences of the entry of robots in Indonesia

The setting of human-robot interactions is one of two aspects that have a significant impact on their lives. Human-robot relationships are similar. Vertically, humans and robots have the same relationship as humans do with God. 139 This is because humans must carry out activities or commands, whereas God must abandon or prohibit some tasks or directives. Horizontally, the relationship between humans and robots is equivalent to the interaction between humans and humans. 140 This is because humans, as social beings, must maintain control and be helpful.

Robots and humans must have a healthy connection with no disagreement or argument, as this can lead to trouble in people's lives later.[20] According to Louis O. Kattsoff, he provides a view of humans from various points of view, such as humans and animals are both exactly the same, every human being is an impossibility until the moment he is born, humans are machines that are fed and produce thoughts, humans are God's work, humans are just a weed, the weakest thing in the universe, but he is a thinking weed, and a noble human is simply an image of God. 141 Meanwhile, a robot is a machine that is specifically designed to assist people. Based on these changes and social consequences, it is possible that new problems will arise when the law is left behind by technology.

In the author's opinion, Indonesia will not be separated from political products that can produce the law itself. So, the academic text on the Bill on Robot Restrictions must be sought to have the potential to help the government in overcoming regulatory problems that should be initiated.

3.7 Substantial Aspects That Must Be Contained in Legal Regulations Regarding Robots in Indonesia

The legal regulation of robots, which arose as a result of the convergence of humans and robots, might generate any substantive aspects that must be addressed in these regulations. To determine all of the substantive features that must be included in legal legislation governing robots in Indonesia, the author begins by identifying the crimes that robots can commit.[21]

Even though robots and people are two distinct variables, they are made of different basic materials yet have the same aims, rights, and obligations. The two are inextricably linked, as the technorobotic period has coexisted with human civilization 5.0 and human civilization 7.0. Because, according to the author, humans will continue to develop advanced robot technology in the future, including humanoid robots and cyborgs with amazing artificial intelligence and the ability to move freely.

4. Conclusion

TRIPs' Article 27 paragraph 1 states that inventions in all technological disciplines are patentable, implying that creative ideas such as those utilizing artificial intelligence are governed and protected by national patent laws whose provisions are affected by TRIPs. The patent rules of the United States, Japan, and Indonesia include sections on computer programs, although they do not particularly address inventions utilizing artificial intelligence. Although only the United States and Japan have issued patent guidelines for AI ideas, the patent laws of these three countries protect AI creations in accordance with their respective national patent laws.

Lawrence Lessing's Pathetic Dot/New Chicago School theory can help to create security models for artificial intelligence systems. This protection model uses four powers: Patent Law ("Law"), which is provided by the state; Social Norms ("Norms"), which protect the cultural aspects of the surrounding community; Market ("Market"), which protects business stakeholders; and Program Code/Source Code ("Architecture"), which protects programmers who develop computer program technology. These four abilities, when combined, provide varying levels of defense against artificial intelligence (AI) advancements.

As a result of robot-human interaction, it may lead to conflict in the future, with technological determinism in the development of robots that occurs in Indonesia, none other than the overall factors that determine how the development of robot technology is prioritized due to the existence of elements of globalization interests that force Indonesia to use technology. robots, so that Indonesia does not rank first among developing or developed countries, particularly those in Asia.

As a result of the influence of globalization, many Indonesian workers are being replaced. The potential of hundreds of layoffs and robot replacement is creating new challenges for workers. Furthermore, humans who utilize robots for personal services may record consumers' personal data, increasing the risk of data theft through hacking. As a result, the urgency of legal control of robots must be technically regulated so that human existence is protected and not alienated by robots in the future.

The legal regulation of robots in Indonesia must relate to the 1945 Constitution as the highest constitution in forming philosophical aspects derived from Pancasila and the Preamble to the Republic of Indonesia's 1945 Constitution. In robot law, the philosophical aspect must be altered with the goal of building an Indonesian State Government that defends the entire Indonesian nation and all of Indonesia's blood while also advancing the general welfare of the Indonesian people.

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Third, the social side necessitates the creation of regulations to suit society's requirements in a variety of ways. The sociological basis is based on empirical facts about the development of problems and needs in society and the state for robots as a result of cooperation between humans and robots, both positively and negatively, and it aids in the resolution of all future social problems related to the misuse of robots. front.

According to Law Number 11 of 2012 on the production of Statutory laws, the production of legislation continues to prioritize formal and material factors in the legal regulation of future robots and refers to the laws made for robots.

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