

JURNAL ILMIAH KEBIJAKAN HUKUM
Volume 17 Number 2, July 2023: 165-182
Jurnal Nasional SINTA 2, Accredited No: 164/E/KPT/2021
p-ISSN: 1978-2292 (print) e-ISSN: 2579-7425 (online)
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OPTIMIZATION OF PATENT MANAGEMENT THROUGH ONLINE MARKETPLACES: FORMULATION OF PATENT REGULATION IN THE FORM OF NON-FUNGIBLE TOKENS IN INDONESIA

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Submitted: 18-03-2023; Approved: 03-07-2023
DOI: http://dx.doi.org/10.30641/kebijakan.2023.V17.165-182

ABSTRACT

This research seeks to examine a Patent regulation in the form of a Non-Fungible Token (NFT-Patent) in Indonesia. The implementation of NFT-Patent is intended to overcome the problems of patent management in Indonesia, such as the long and expensive bureaucratic process of patent, the absence of an integrated patent commercialization ecosystem, and the existence of a legal vacuum regarding the valuation mechanism of a patent. This research aims to answer a formulation of the problem related to how the model of NFT-Patent regulation through the online marketplace in Indonesia. The analysis of the problem formulation will start by comparing Non-Fungible Token (NFT) regulations in Indonesia with other countries, followed by conceptualizing the transfer of ownership rights from NFT-Patent carried out through an online marketplace, then end by formulating the regulation of the NFT-Patent online marketplace in the statutory regulations in Indonesia. By combining doctrinal research methods and reform-oriented research, this study found that based on Indonesia's positive law, NFT is categorized as a crypto commodity which is an object of tax and BKP. On the contrary, the United States sees NFT as conventional IPR in digital form for tax purposes. NFT-Patent is categorized as an intangible movable object whose transaction is considered valid as long as it meets the provisions of Article 1320 of the Civil Code and Article 46 paragraph (2) of the Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems. In its implementation, a transition process is carried out with several stages. The transition stages are regulated in the Regulation of the Minister of Law and Human Rights with the Directorate General of Intellectual Property as the manager. If most of the transition process has been running, the government needs to update the 2016 Patent Law by implementing the Separation Principle by separating the purpose of using inventions into 3, namely consumption, production, and innovation. Ultimately, this research recommends the government to regulate NFT specifically, synergize with blockchain-based Patent ecosystem development companies and encourage collaboration between universities and industrial companies in developing Patents.
Keywords: Non-Fungible Token; Patent; Online Marketplace.

1. INTRODUCTION

The increasingly dynamic flow of globalization indirectly requires inventors to protect their inventions so that these inventions can provide benefits and can be developed sustainably. This protection aims to protect inventions from violations of Intellectual Property Rights (IPR), such as forgery, piracy, and plagiarism. Therefore, the government has passed various legal products to protect these inventions, one of which is through the implementation of a patent system. In its history, Indonesia has implemented this patent system for the first time through the ratification of Law 6 of 1989 concerning Patents (1989 Patent Law). This law has been amended several times, one of which is through the ratification of Law Number 13 of 1997 concerning Amendments to Law Number 6 of 1989 concerning Patents (1997 Patent Law). The revision of the 1989 Patent Law is a form of commitment from the Government of the Republic of Indonesia to carry out its obligations

as a WTO Member to adjust regulations on the patent system in Indonesia so that it is in harmony with international conventions in the field of intellectual property rights, one of which is the TRIP's Agreement.

As time went on, in order to adapt various changes to accommodate the increasingly dynamic need for patents, the 1997 Patent Law was repealed and replaced by Law Number 14 of 2001 concerning Patents (2001 Patent Law). Finally, the Patent Law was renewed through the ratification of Law Number 13 of 2016 concerning Patents (2016 Patent Law). The ratification of the 2016 Patent Law drew a positive response from domestic patent applicants. This can be seen from the increase in domestic patent applications since the enactment of this law. [1] Given that so far, the number of registered patents is still dominated by foreign parties. Based on the results of the World Intellectual Property Organization (WIPO), the percentage of patent ownership still shows the dominance of foreign patents as much as 92% of the number of registered patents.[2] This is, of course, very far compared to China and Japan, whose registered patents are dominated by domestic or domestic. Domestic patents in China reached 83.1% and Japan 78.2%.[3] This condition is normal because a patent is a property/civil right whose acquisition requirements are relatively more difficult compared to other fields of intellectual property. After all, developing an invention that is unique and applicable to the industry requires quite high research and development costs. Therefore countries with large economies tend to have higher registered patents of domestic origin.

Not only that, cost issues often become an obstacle for domestic inventors to be able to maximize the potential of their patents. The evidence for this claim is that there is an increasing tendency towards the cancellation of patents within a certain period of time.[4] Based on the provisions of Article 130 of the Patent Law, there are at least four things that can invalidate a registered patent, namely, an application from the patent holder that is granted by the Minister, a court decision that has permanent legal force, a decision from the Patent Appeal Commission, and non-fulfillment of the obligation of the owner or patent holder to pay an annual fee. Among the four reasons for the revocation of registered patents, if further investigated, it can be seen that most of them are caused by "non-fulfillment of the obligation of the owner or patent holder to pay an annual fee."[5]

Basically, there are 3 reasons why a patent is revoked on the grounds that the patent holder does not pay the annual fee.[6] First, the patent has no economic value, in other words, the patent cannot be absorbed or provides benefits to the industry. This means that patents owned by patent holders do not make a significant contribution or are irrelevant to the development of industry or society in general. Second, research and development costs are quite large. This causes patent holders to be unable to continue the investment required to develop inventions protected by the Third Patent. Specifically for patents of domestic origin, the existing maintenance costs are considered quite high. The three reasons above make the Patent owner/holder no longer extend the Patent protection period. This is very unfortunate, considering that universities are the second most registered patent owners after industrial companies, even though the budget for universities is not as big as industrial companies. Domestic patent applications are currently still dominated by universities.[7] This situation is exacerbated by the lack of collaboration and monetization of university patents with industry so an integrated patent ecosystem cannot be formed due to the absence of effective and efficient means of commercialization.[8]

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1 Jumlah permohonan Paten dalam negeri pada tahun 2016 terdapat 1.061, 2017 terdapat 1.412, 2018 terdapat 1.399, 2019 terdapat 1.599, dan 2020 terdapat 1.244 permohonan. Direktorat Jenderal Kekayaan Intelektual, "Laporan Tahunan Direktorat Jenderal Kekayaan Intelektual 2020" (Jakarta: Kementerian Hukum dan Hak Asasi Manusia, 2020), 51.

2 "World Intellectual Property Indicators 2021", Geneva, World Intellectual Property Organization, 2021, 32, https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2021.pdf.

3 World Intellectual Property Organization.

4 From 2014 to 2016 there were 9153 Patents written off and from 2017 to 2018 there were 4546 Patents.. Ardani, "Penghapusan Paten Terdaftar Di Indonesia," 150.

5 Ardani, 149.

6 Ardani, 163–64.

7 Direktorat Jenderal Kekayaan Intelektual, "Laporan Tahunan Direktorat Jenderal Kekayaan Intelektual 2020," 2021, 45.

8 Dalam seminar "The Art of Monetizing Your Patent" oleh Dede Mia Yusanti dan Achmad Affandi, diadakan Pada

If this continues, the existence of higher education as a developer of civilization and knowledge will fade over time.

There is another reason why an integrated patent ecosystem cannot be formed,[9] bearing in mind that many industrial companies also have the ability to survive for an average of twelve years in maintaining their patents, and after that, the industry holding these patents fails to renew the patent.[10] In general, patents are difficult to trade because areno patent ecosystem functions to engage in and transact, buy, license, finance, sell, research, and commercialize patents transparently and globally.[11]

In addition, in practice, the process of filing a patent application is quite complicated, so it takes a lot of time and costs. For example, an application for an administrative examination takes a maximum of 18 months from the date of the announcement,[12] and a substantive examination takes a maximum of 36 months from the date of receipt.[13] This is not without reason because in terms of bureaucracy, in 2021, Indonesia is ranked 131st out of 173 countries in terms of developing innovation-friendly regulations.[14] In addition to bureaucratic matters, there are difficulties in valuing a patent. This is evident from the fact that no government regulation has been ratified regarding the regulation of patents as fiduciary guarantees. Even though the regulation of patents as objects of fiduciary guarantees has been normalized in Article 108 paragraph (2) of the 2016 Patent Law, until now, there has not been a consensus or agreed mechanism to determine the valuation of a patent.[15]

In addition to bureaucratic matters, there are difficulties in valuing a patent. This is evident from the fact that no government regulation has been ratified regarding the regulation of patents as fiduciary guarantees. Even though the regulation of patents as objects of fiduciary guarantees has been normalized in Article 108 paragraph (2) of the 2016 Patent Law, until now, there has been no consensus or agreed mechanism to assess the valuation of a patent.[16]

After looking at the various problems above, in general, there are several problems with patent management in Indonesia. First, patent bureaucracy process is long and expensive. Second, there is no integrated patent commercialization ecosystem. Third, there is a legal vacuum regarding the valuation mechanism for a patent. Therefore we need an out-of- box solution to solve the various problems above, one of which is implementing NFT in the patent management regime in Indonesia. Non-Fungible Token (NFT) refers to the synonym "fungible," which is "replaceable," which means a token that cannot be replaced. This leads to the understanding that NFT is unique digital assets and cannot be substituted for anything else. Therefore, NFT can be equated or considered as a certificate of ownership in the Blockchain system.[17]

Tanggal 24 April 2020 oleh Direktorat Jenderal Kekayaan Intelektual.

9 Fritz Machlup, *An Economic Review Of The Patent System*, 15, Washington, US Government Printing Office, 1958, 14.

10 Ted Sichelman, "Commercializing Patents," *Stanford Law Review* 62, no. 2, 2010: 341.

11 Shlomit Yanisky-Ravid dan Edward Kim, "Patenting blockchain: Mitigating the Patent infringement war," *Alb. L. Rev.* 83, 2019: 603.

12 UU Paten 2016, Pasal 46 ayat (2) *jo.* Pasal 25.

13 UU Paten 2016, Pasal 46 ayat (2) *jo.* Pasal 51 ayat (2).

14 "Global Innovation Index 2021", Geneva: World Intellectual Property Organization, 2021, 94, https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf.

15 Helitha Novianty Muchtar dkk., "Urgensi Pengaturan Valuasi Paten Untuk Start Up Dalam Rangka Meningkatkan Perekonomian Di Era Industri 4.0," *Jurnal Bina Mulia Hukum* 6, no. 1, 2021: 84, https://doi.org/10.23920/jbmh.v6i1.170.

16 Helitha Novianty Muchtar dkk., "Urgensi Pengaturan Valuasi Paten Untuk Start Up Dalam Rangka Meningkatkan Perekonomian Di Era Industri 4.0," *Jurnal Bina Mulia Hukum* 6, no. 1, 2021: 84, https://doi.org/10.23920/jbmh.v6i1.170.

17 Raeesah Chohan and Jeannette Paschen, "What Marketers Need to Know about Non-Fungible Tokens (NFTs)," *Business Horizons* 18, no. 1 (2021): 21.

So far, there have been several studies discussing the integration of patents and NFT, including opportunities for commercialization of NFT in legal practice,[18] the use of NFT as protection of patent rights,[19] to the challenges of implementing patents and intellectual property assets as NFT.[20] An example of the implementation of this NFT-Patent can be seen in the IPwe Platform, which provides NFT-Patent valuation services as well as NFT-Patent buying and selling market services with companies such as Crown Electronics which offers its fiber optic technology patents, CentriPetal, which offers cybersecurity technology patents, and there are still more than 1000 other users who offer their technology patents on IPwe.[21] However, there is still no research that discusses the scope of NFT regulation based on the positive law context in Indonesia and then compared with other countries, then a conceptual review regarding the transfer of patent rights through NFT in the marketplace, along with regulatory ideas for implementing a patent transfer in the form of NFT through the marketplace. Therefore, this study offers a novelty in the form of an analysis of normative consistency, transitional concepts, and the idea of NFT-Patent regulation in Indonesia to maximize the use of patents in the context of commercialization.

Thus, in the end, this research will answer a formulation of the problem, namely, what is the model for NFT-Patent regulation through online marketplaces in Indonesia? Analysis of the formulation of the problem will start by comparing NFT regulations in Indonesia with other countries, followed by conceptualizing the transfer of ownership rights from NFT-Patent carried out through online marketplace, then end by formulating the regulation of the NFT-Patent online marketplace in the statutory regulations in Indonesia.

This study aims to formulate a mechanism for patent management through NFT integration arrangements with an online marketplace, To be able to solve bureaucratic problems, commercialize means, and fill legal voids to evaluate a patent;. because in practice, online marketplace proved able to boost market share and bridge the buyers and sellers.[22] The NFT will also be used as a validator and valuation tool for patents to be traded.[23] Therefore this paper wants to propose an idea of reforming the existing patent regime by offering integration of patents into the form of NFT (hereinafter referred to as NFT-Patent), which can be traded in an online marketplace.

To achieve these objectives, this research will be structured as follows. After the Introduction section, Section 2 will discuss the types of research methods and approaches used to dissect the existing problem formulation. Furthermore, Section 3.1 will analyze NFT arrangements in the positive law of Indonesia and a number of countries. This section will discuss the legal views of Indonesia, the United States, Australia, and European countries to obtain normative consistency regarding NFT. Then Section 3.2 will explain the concept of transferring rights from a Patent through the NFT-Patent online marketplace platform. At this stage, we will discuss the material properties of patents and NFT, as well as the concept of transferring NFT to NFT-Patent tokenization. Section 3.3 will examine the idea of regulating the NFT-Patent market in the context of Statutory Regulations in Indonesia, which includes the transition period and post-conventional patent transition. Finally, Section 4 will describe the conclusion in the form of a brief answer to the existing problem formulation deductively.

18 Ranti Fauza Mayana et al., "Intellectual Property Development & Komersialisasi Non-Fungible Token (NFT): Peluang, Tantangan Dan Problematika Hukum Dalam Praktik," *ACTA DIURNAL Jurnal Ilmu Hukum Kenotariatan* 5, no. 2 (2022): 202.

19 Samer Barakat, Khalil Yaghi, and Hanady Al-Zagheer, "The Use of NFT for Patent Protection," *Advances in Dynamical Systems and Applications* 17, no. 1 (2022): 107.

20 Seyed Mojtaba Hosseini Bamakan et al., "Patents and Intellectual Property Assets as Non-Fungible Tokens; Key Technologies and Challenges," *Scientific Reports* 12, no. 1 (2022): 1.

21 IPwe Team, "The IPwe Platform," Infografis (Perancis: IPwe, Inc., 2021); "IPwe," IPwe, accessed May 26, 2023, https://ipwe.com/; "Crown Electrokinetics Acquires 10 Patents from IBM Using the IPwe Platform," *IPwe* (blog), October 11, 2021, https://ipwe.com/crown-electrokinetics-acquires-10-patents-from-ibm-using-the-ipwe-platform/.

22 Erik Maier dan Jaap Wieringa, "Acquiring customers through online marketplaces? The effect of marketplace sales on sales in a retailer's own channels," *International Journal of Research in Marketing* 38, no. 2, 2021: 311–12.

23 Qin Wang dkk., "Non-fungible token (NFT): Overview, evaluation, opportunities and challenges," *arXiv preprint arXiv:2105.07447*, 2021: 9–10.

2. RESEARCH METHOD

This research combines doctrinal research and Reform Oriented Research. Doctrinal legal research is used to examine policies regarding the application of NFT to the patent management regime at both the national and international levels.[24] The application of the Reform Oriented Research method to assess the quality of various regulations that are currently in effect so that recommendations can be determined what is needed to make improvements.[25] This model is based on a legal reform research methodology to provide advice on changes to existing laws.[26] This methodology is based on an in-depth study of the law to get to the core of the matter. Furthermore, based on these findings, Reform Oriented Research will direct researchers to formulate solutions in the form of reforms (changes) to the law.

This study uses a statutory, comparative, and conceptual approach. These approaches will be carried out as follows: (1) the statutory regulation approach will be used to analyze the hierarchy, principles, and legal ratios of positive law relating to patents and NFT;[27] (2) the comparative approach will compare the legal construction of NFT in Italy, Germany, the European Union, the United States of America and Australia with the legal constructions in Indonesia;[28] (3) the conceptual approach will examine the views of legal scholars and the doctrines that have developed in Patent and NFT law [29]. The primary legal materials used are Statutory Regulations in the field of Patents and NFT, while the secondary legal materials used are journal articles and books related to Patent and NFT laws. Then the non-legal materials used are legal dictionaries of scientific research reports.

3. DISCUSSION

NFT Regulations in Indonesian Positive Law and a Number of Countries

Positive law in Indonesia so far has not specifically regulated NFT; moreover, patents in the form of NFT are still a new thing. Even so, there are still a number of regulations that can be a source of interpretation in the NFT regulatory mechanism. The first thing to note abount the legality of NFT in Indonesia is to position NFT not as a means of exchange like money because cryptocurrencies such as Bitcoin or other digital payment tokens are prohibited from being used as a medium of exchange in business transactions in Indonesia which are regulated in Article 34 of Bank Indonesia Regulation No. 18/40/PBI/2016 of 2016 concerning Implementation of Payment Transaction Processing (PBI No. 18/40/PBI/2016).

When NFT is understood and not used as a medium of exchange, the use of NFT, in reality, is only limited to verify the identity of ownership of intellectual work and is only traded using legal currency. The limitations of the NFT in its usefulness lead to the NFT being interpreted as a conventional digital object. According to Article 1 of the Regulation of the Minister of Trade Number 99 of 2018 concerning the General Policy for Organizing Crypto Asset Futures Trading (Permendagri 99/2018), NFT is qualified as Crypto Assets.

Further explanation regarding Crypto Assets in Permendagri 99/2018 can be found in Commodity Futures Trading Regulatory Agency Regulation Number 5 of 2019 concerning Technical Provisions for Organizing Crypto Asset Physical Markets on Futures Exchanges (Bappebti Regulation 5/2019). The provisions of Article 1 Number 7 of CoFTRA Regulation 5/2019 contain elements of a commodity that can be referred to as Crypto Assets. These elements include:

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24 Penelitian dimulai dengan membedah kerangka hukum positif, lalu melihat pertimbangan-pertimbangan masalah yang berimplikasi kepada hukum, serta menelisik politik hukum yang melandasinya. Wing Hong Chui and Mike McConville, *Research Methods for Law* (Edinburgh: University Press Edinburgh, 2007), 20–21.

25 Aan Efendi, Dyah Ochtorina Susanti, and Rahmadi Indra Tektona, *Penelitian Hukum Doktrinal* (Yogyakarta: LaksBang Justitia, 2019), 34.

26 Efendi, *dkk.*

27 Peter Mahmud Marzuki, Penelitian Hukum (Jakarta: Prenadamedia Group, 2016), 137.

28 Peter Mahmud Marzuki, 172

29 Peter Mahmud Marzuki, 175-176.

a. Intangible commodities in the form of digital assets;
b. Using cryptography;[30]
c. peer-to-peer network
d. distributed ledger to manage the creation of new units, verify transactions, and secure transactions without outside interference.

NFT that basically uses cryptography on a shared distributed ledger (blockchain) automatically qualifies for Crypto Assets in CoFTRA Regulation 5/2019. Therefore, CoFTRA Regulation No. 5 of 2019 can be the basis for the legality of NFT and NFT-Patent. This resulted in NFT having to comply with other regulations governing the implementation of physical commodity markets on futures exchanges in general, as stipulated in CoFTRA Regulation 5/2019. NFT also may not conflict with Law Number 11 of 2008 concerning Electronic Information and Transactions as amended by Law Number 19 of 2016 (Electronic Information and Transaction Law) as a law that specifically regulates electronic information and transactions.

As result of entering the NFT qualification as a Crypto Asset, as referred to in CoFTRA Regulation 5/2019, has implications for the tax regulations of the NFT itself because of its nature which is categorized as a commodity. The regulation of NFT is not regulated specifically in Indonesian positive law, but several regulations can be found that can become the basis for the legality of imposing NFT taxes in Indonesia. NFT has the potential to be included in the categorization of goods subject to Value Added Tax (VAT) because NFT can be categorized as intangible Taxable Goods. This was then reaffirmed in the qualifications of Article 1A Paragraph (1) letter a of Law Number 8 of 1983 concerning Value Added Tax on Goods and Services and Sales Tax on Luxury Goods as amended by Law Number 11 of 1994, Law Number 18 of 2000, Law Number 42 of 2009, Law Number 7 of 2021, and Law Number 6 of 2023 (collectively referred to as the Non-Tax State Revenue Law). Especially in the explanation of Article 1A Paragraph (1) Letter a of the Non-Tax State Revenue Law, it has strengthened the argument that NFT has met the qualifications as Taxable Goods because of an agreement. This agreement is applied to the smart-contract feature in the NFT.

Law Number 7 of 1983 concerning Income Tax as amended by Law Number 7 of 1991, Law Number 10 of 1994, Law Number 17 of 2000, Law Number 36 of 2008, Law Number 7 2021, and Law Number 6 of 2023 (collectively called the Income Tax Law) can also become the basis for the legality of imposing NFT taxes in Indonesia. In Article 4 Paragraph (1) letter d number 4 of the Income Tax Law, NFT can be classified as an economic capacity, and in the elucidation of Article 4 of the Income Tax Law, it can make NFT an additional economic capability in the category of other income. The use of Article 4 is subject to a tax of 15 percent which is written in Article 23 Paragraph (1) letter a of the Income Tax Law; because NFT is traded using Ethereum, the assessment of the amount of tax imposed is 15 percent which is calculated based on the assets acquired from the sale.

The tax liability on NFT is reinforced in Article 2 paragraph (1) of the Income Tax Law. Article 2 paragraph (1) of the Income Tax Law states that a person who has met the objective and subjective requirements in Statutory Regulations must register himself as a Taxpayer (WP) without exception. The objective requirement in question is someone who can be subject to taxation according to the Income Tax Law, and subjective conditions are someone who can be subject to taxation according to the Non-Tax State Revenue Law.

The following discussion, after explaining the legality and tax of NFT in Indonesian law, is a discussion regarding the comparison of other countries in considering the legality of NFT. The legality of NFT in other countries is intended to be a reflection of the formation of regulations that are more specific to NFT and NFT-Patent. In addition, due to the nature of NFT-Patent, which seek to facilitate the sharing of data between entities and jurisdictions of different countries, it is necessary to consider the different legal status of NFT and

30 Kriptografi adalah penerapan teknik matematika yang berguna untuk mengamankan suatu informasi seperti kerahasiaan, integritas data, serta otentikasi. Dhiya Calista, Al Farissi, and Mastura Diana Marieska, "Sistem Pengamanan Data Menggunakan Kriptografi AES dan Blockchain Berbasis Android," *JUPITER (Jurnal Penelitian Ilmu dan Teknologi Komputer)* 13, no. 2 (October 25, 2021): 220–26, https://doi.org/10.5281/3927.jupiter.2021.10.

regulatory frameworks in different jurisdictions. The next section is intended to provide an overview of how NFT is handled in different jurisdictions around the world.

Currently, several countries and unions have also begun to discuss NFT in general in designing and interpreting their regulations. The European Union, for example, divides NFT into two forms to try to interpret it in its regulations, namely, original NFT and Fractional-NFT (F-NFT).[31] The regulation which is the source of legal interpretation by the European Union is the Markets in Crypto-Assets Regulation (MiCAR) as a Regulation of the European Union Parliament and the Council on Markets in Crypto-Assets which, according to Article 136 Paragraph (2) MiCAR applies 2022 and can be implemented directly in all EU member states after a transition period of 18 months.

Article 3 Paragraph (1) Number 2 MiCAR defines Crypto Assets as "digital assets of value or rights that can be disseminated and stored electronically using distributed ledger technology or digital assets that use similar technology." This definition of crypto assets by MiCAR creates an independent definition that is at the same time different from the definition of Crypto Assets in Indonesia because the embodiment in disseminating rights has no boundaries. In this definition, MiCAR does not include original NFT because they are unique Digital Assets and cannot be freely distributed, are non-substitutable, and must be purchased in advance to obtain a unique derivative code. Meanwhile, F-NFT can be distributed freely, is not unique again, and can be exchanged again with other F-NFT even though the unique code is different, but the value and digital assets are the same.

Although current market trends suggest that NFT can be traded on Crypto Exchanges and used as a medium of exchange in limited cases, they are not yet easy to exchange.[32] The relative value of one NFT to another, each of which is unique and cannot be determined by comparison with existing exchanges or equivalent assets. These properties limit the extent to which these NFT can be used as financial instruments, thereby limiting the risk to clients and the market. Therefore, MiCAR's exclusion of NFT seems reasonable. On the other hand, parts of the F-NFT will not be unique and will be replaceable, which indicates that MiCAR can be the basis of legality.

One of the European Union member countries that has developed laws that are more specific in assessing the legal basis of NFT is Germany. Departing from the more general legal regulations within the European Union, at least Germany has established several regulations that can form the basis of the legality of NFT. These regulations include the German Banking Act (Kreditwesengesetz, abbreviated as KWG).[33]

Section 1 Paragraph (11) paragraph 4 of KWG explains that Crypto Asset is a digital representation of value that has not been issued or guaranteed by a central bank or public body and has no legal status but is accepted by society/law as a medium of exchange/payment on the basis of an agreement or actual practice, or may also be used for investment purposes and may be transmitted, stored and traded electronically. Instruments contained in this definition that can be used as a source of interpretation in the legality of NFT is digital representations that can be used for investment purposes and can be transmitted, stored, and traded electronically. This definition can be used as an interpretation of NFT as a group of Crypto Assets under German law.

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31 Kata "*fractional*" tidak ditemukan dalam padanan kata di KBBI tetapi dapat ditemukan istilah yang tepat untuk istilah "*fractional*" yaitu "pecahan". Sesuai terjemahan aslinya maka Fractional-NFT dapat didefinisikan sebagai pecahan dari NFT asli milik seseorang yang membeli suatu karya NFT tersebut. Ketika seseorang membeli suatu karya NFT, maka NFT asli tetap ada dan dapat diperjualbelikan kembali, sementara karya NFT yang seseorang beli itu memiliki kode unik sendiri bahwa seseorang tersebut merupakan salah satu pemilik dari NFT asli itu. Kegunaan dan peran F-NFT ini menimbulkan sifat yang tidak unik dan dapat digantikan. Claudia Di Bernardino et al., "NFT-Legal Token Classification," in *EU Blockchain Observatory and Forum NFT Reports* (The Open University's repository of research publications and other research outputs, The Open University, 2021), 24.

32 Di Bernardino et al.

33 Di Bernardino et al., 4–8.

In addition, Italy, which is a member state of the European Union, has so far not developed a regulatory framework that specifically applies to NFT, but at least when compared to Germany, Italy appears to be more specific in defining Crypto Assets. Italy has known the idea of technology based on distributed ledgers and smart contracts that can form the basis of the legality of NFT in Italy. This is contained in Law Number 12 of 2019 on Urgent Simplification Measures for Businesses and Public Administration. Specifically stated in Article 8:

a. Distributed ledger-based technologies as IT technologies and protocols that use a shared, distributed, replicable, concurrently accessible, decentralized ledger in a cryptographically based framework, such as to enable the recording, validation, update, and storage of unencrypted data and more further protected cryptographically which can be verified by each participant, immutable and non-modifiable.

b. A smart contract is a computer program that operates on a distributed ledger-based technology whose implementation automatically binds two or more parties based on an agreement determined by each party. The smart contract fulfills the requirements of the written form after the computer identification of the parties involved through a process that has the conditions laid down by the Italian Digital Agency with guidelines to be adopted within 90 days from the date of entry into force of this law.

The conclusion that can be drawn from the comparison between Indonesia, the European Union, and their member countries is that the interpretation of NFT is still associated with Crypto Assets. As long as the definition of Crypto Asset contains elements that are owned by the NFT, this regulation will serve as the basis for the legality of the NFT. Even though quite a number of countries have regulated NFT in their Statutory Regulations, on the other hand, several countries still respond to NFT by questioning and considering the regulatory concept from a legal perspective to regulate NFT.

The crypto assets referred to above are supported by blockchain technology. Blockchain is a ledger that has high resistance to data corruption which is a system without a centralized authority.[34] Several countries that have not specifically regulated Patent NFT are still conducting further research on the potential of blockchain technology. For example, the Australian government, through the Digital Transformation Agency (DTA), stated that the blockchain ecosystem, which is one of the same instruments as the NFT, is a new technology, so an evaluation is needed to assess how far the blockchain ecosystem can provide benefits. In addition, DTA assesses that new analysis is still needed to respond to the challenges of the blockchain ecosystem, assesses that the blockchain ecosystem is still limited, and requires observation of the types of problems to be solved through blockchain.[35] The attitude of DTA Australia is based on research conducted by the United States Department of Commerce or the National Institute of Standards and Technology (NIST). NIST makes in-depth observations of blockchain technology, but NIST itself allows the use of blockchain if it is appropriate and benefits the government.[36]

NIST's attitude in responding pragmatically to the blockchain ecosystem has resulted in regulations in the United States classifying NFT as digital assets that are treated like conventional IPRs with intangible material properties for tax purposes.[37] Given its nature which has been classified as intellectual property for tax purposes, the United States classifies taxes for NFT into two types, namely, taxes for the sale of NFT and taxes for royalties if the NFT are in the form of works of art or patents. On the sale of NFT, tax is imposed according to the profit from the sale of property, which is equivalent to Income Tax (PPh) in Indonesian positive law, while if it is used as a form of royalty or a license, the tax is imposed on every sale and purchase transaction

34 Dylan Yaga et al., "Blockchain Technology Overview" (Gaithersburg, MD: National Institute of Standards and Technology, October 2018), 1.

35 Digital Transformation Agency, "Blockchain Overview: Australian Government Guide," Collection (Commonwealth of Australia, February 12, 2019), Australia, https://www.dta.gov.au/help-and-advice/technology/blockchain/blockchain-overview-australian-government-guide. Diakses tanggal 17 Februari 2022.

36 Dylan Yaga et al., "Blockchain Technology Overview" (Gaithersburg, MD: National Institute of Standards and Technology, October 2018), 2-5.

37 Nathan W. Giesselman dkk., "Proliferation of NFT Transactions Raises Numerous US Tax Questions," *The Contemporary Tax Journal* 10, no. 2, 2021: 6.

which in Indonesian law is equivalent to Value Added Tax (VAT).[38]

The Concept of Transferring Rights from a Patent Through the NFT-Patent Online Marketplace Platform

Material Properties of NFT

Based on Article 504 of the Civil Code (KUHPerdata), the types of objects themselves can be divided into several categories, namely, first, movable objects and immovable objects. Second, tangible objects and intangible objects. According to Munir Fuady, what is meant by movable objects are all objects that basically have the property to move, be moved, or can move, except for objects that originally could move or be moved but are classified as immovable objects by law. Meanwhile, immovable objects are all objects that basically have the characteristic of not moving, cannot be moved, or are unable to move, except for objects that are initially immovable or cannot be moved but are classified as movable objects by law.[39] Broadly speaking, patents are exclusive rights granted by the state to inventors for their inventions in the field of technology. The exclusive right in question is the right to obtain the maximum economic benefit, which this right is manifested in the form of issuing a Patent Certificate. In addition, the provisions of Article 59 paragraph (3) of the 2016 Patent Law classify patents as intangible movable objects. Thus, looking at Munir Fuadi's explanation and the provisions in the 2016 Patent Law, it becomes clear that a patent is an intangible movable object due to the stipulation of law.

As a digital asset an NFT is a unique digital representation of an asset, such as an image, video, music, or other digital artwork. Even though an NFT can have tradable value, it is still a digital entity and does not have a physical form. Therefore, based on the nature of the material, the NFT is classified as an intangible movable object. NFT is in the form of digital data and not in physical form, as referred to in Article 1 of Permendag 99/2018, which classifies NFT as crypto assets in digital form. Perceived value from NFT is created through a process that is not as pure as the supply-demand concept for a product or item, but the perceived value is created through a patent object which is evaluated through an appraisal based on perceived value. Thus the value of the invention is determined by the Patent Owner and the prospective User or Buyer, which is then agreed upon by the user or person who is willing to pay the agreed amount so that the position of the NFT is between subjective products and objective merchandise products.

There is a common thread that, based on the characteristics described by experts, the 2016 Patent Law and the Civil Code, NFT have characteristics in common with patents, namely that both are movable objects that are intangible. Therefore theoretically, the two can be integrated. In this case, a patent can be used as an NFT to be sold (transferred) or licensed, like buying and selling online in a marketplace.

Transfer of Patents Through the NFT Platform

Patent transfers must be carried out in a notarized or authentic deed.[40] Patents can be transferred in whole or in part for reasons of grants, endowments, wills, written agreements, or other reasons permitted by Statutory Regulations.[41] In addition, patents can be transferred by inventors or owners to individuals or legal entities. In the transfer of a patent, only economic rights are transferred, but moral rights remain attached to the inventor, in other words, the transfer of rights cannot erase the identity of the inventor in the patent certificate.[42]

If OpenSea is an online marketplace platform that provides copyright services in the form of NFT,

38 Giesselman dkk, Proliferation of NFT Transactions Raises Numerous US Tax Questions,", 7.
39 Munir Fuady, *Konsep Hukum Perdata*, Cetakan ke-4 (Jakarta: Raja Grafindo Persada, 2019), 29.
40 UU Paten 2016, Pasal 74.
41 UU Paten 2016, Pasal 74.
42 UU Paten 2016, Pasal 75.

the IPwe platform is an online marketplace that specifically provides patent services in the form of NFT. In IPwe, specifically only offering patents that have been through valuation that can be traded, for example, Crown Electronics' NFT-Patent, which offers technological inventions regarding fiber optics, and many other companies offer technological inventions in IPwe..[43] Therefore, the transfer of patents in IPwe is entirely under the evaluation carried out by IPwe through the blockchain system and smart contracts.

Transfer of patents through the NFT-Patent market must comply with the provisions of the Patent Law and Government Regulation Number 46 of 2020 concerning Requirements and Procedures for Registration of Patent Transfers (Government Regulation on Patent Transfer). In this case, the transfer referred to is a Patent traded at the NFT-Patent market. Later, the inventor or owner entitled to the patent can sell (transfer) or license the patent to another party. Although there are no rules that specifically regulate digital assets and NFT transactions, NFT-Patent transactions can be carried out based on the principle of freedom of contract. Transactions in the NFT-Patent trade are valid transactions as long as they comply with the provisions of Article 1320 of the Civil Code and Article 46 paragraph (2) of Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems (PP 71/2019).

The NFT-Patent will contain information in the form of the identity of the right owner, inventor, invention title, date of receipt, date of grant, and patent number, as well as the substance or contents of the patent. The integration of patents into the form of NFT is expected to increase inventors' acquisition of economic rights for their inventions in the field of technology. Because NFT-Patent can reduce maintenance costs, transfer costs, and increase Patent liquidity because NFT-Patent uses a smart contract system in every transaction. In this way, the difficulty in determining the valuation of a patent can be overcome, and this will make the patent transaction process more flexible. This is because NFT-Patent can increase Patent liquidity and facilitate the regulation of Patents as fiduciary guarantees in government regulations.

NFT-Patent Tokenization Concept Through Online Marketplace

NFT tokenization is the creation of a digital representation of an intellectual property object in the real world onto a decentralized blockchain through a smart contract process. Converting an asset into digital form into the blockchain or NFT tokenization can minimize the interference of many parties in the management of a patent. In fact, this optimism from NFT is supported by several literatures which state that this decentralized network enables the trading of digital assets, financial instruments, and tangible assets represented in the form of tokens.

If the use and convenience of NFT tokenization occur, then on the other hand, some things should be considered and re-examined, namely, the problem that will place the NFT ecosystem as a new legal regime and replace existing civil law so that it is as if the ecosystem is in Blockchain is a new jurisdiction for intellectual property. This is because, basically, NFT itself has several aspects that already exist and are represented in civil law. If a person registers assets, buys and sells, and the legal terms of trading an asset, the NFT has its own civil aspect outside of the applicable positive law. This is based on NFT governance which does not only consist of terms and conditions, but NFT also has requirements for a valid contract which is called a smart contract.

The assumption that NFT was created to get rid of existing positive law is based on one of the NFT instruments, namely, smart contracts which are considered not to have the nature of bargaining in forming a contract agreement that binds each party to an agreement. In fact, if someone enters into a smart contract, then that person has agreed because of his own intention to buy an NFT-Patent, which indirectly already has an agreement point between the parties so that it is deemed that there is no need for a bargaining process.

In the Civil Code, it is also stated that a contract is considered valid if it fulfills the provisions in Article 1320 of the Civil Code, namely an agreement between the parties to bind themselves in an agreement, skills, a certain matter, and a lawful cause. Apart from that, this is also confirmed by Article 46 paragraph (2) PP 71/2019, where electronic contracts are considered valid if there is an agreement of the parties, carried out by competent legal subjects or authorized to represent in accordance with statutory provisions, there are certain

43 "Crown Electrokinetics Acquires 10 Patents from IBM Using the IPwe Platform."

things, and the object of the transaction must not conflict with Statutory Regulations, morality or decency, and public order. Therefore, the view of NFT-Patent in general and smart contracts, in particular, tends to rule out existing positive law is a false statement and is proven by its conformity with Indonesian positive law, namely, the Civil Code and Article 46 paragraph (2) PP 71/2019. In order to better understand the flow of NFT-Patent tokenization, the following are the stages of Patent tokenization into NFT (NFT-Patent):

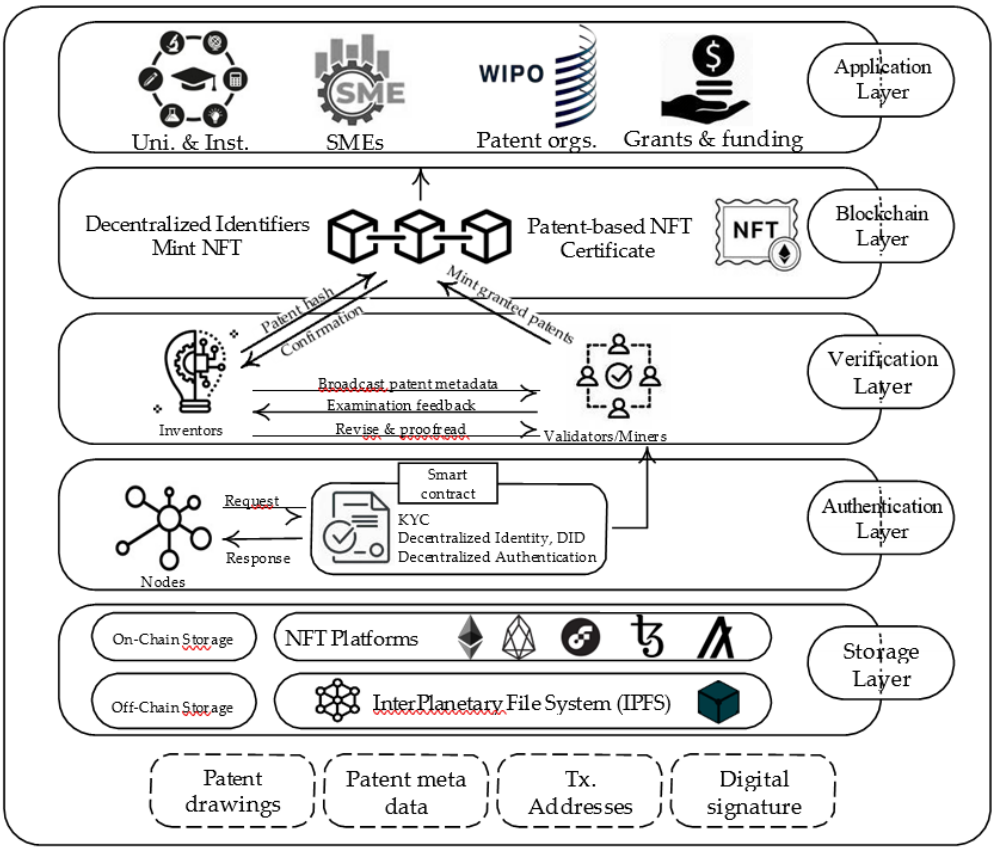


Figure 1. Proposed Architecture to Implement Tokenization on NFT-Based Patents (modified by the author)[44]

The framework proposed in this paper is divided into five parts, namely, the storage layer, authentication layer, verification layer, blockchain layer, and application layer. At the storage layer, data from a Patent can be placed on the off-chain or on-chain layer. The off-chain layer means hosting the metadata separately, while the on-chain layer means incorporating the metadata directly into the NFT smart contract.[45] Off-chain layer providers are Inter Planetary File System (IPFS), and on-chain layer providers are Ethereum, Pinata, Hyperledger, Filecoin, and so on.

At the authentication layer, decentralized identities assist NFT-Patent users, both inventors, and buyers, in identifying the eligibility of a Patent or an NFT-Patent buyer. This identity identification process is carried out by validators in verifying the validity and eligibility of an inventor or prospective buyer using blockchain. If this layer does not exist, then the opportunity for patent infringement is very likely to occur. Therefore, decentralized identities allow NFT-Patent users to verify each party. However, there is no quick way to check

44 Seyed Mojtaba Hosseini Bamakan et al., "A Decentralized Framework for Patents and Intellectual Property as NFT in Blockchain Networks," 2021, 6.

45 Kate Hertz, "Know the Difference: On-Chain and Off-Chain NFTs," diakses 15 Februari 2022, https://www.one37pm.com/nft/tech/on-chain-and-off-chain-nfts.

the legitimacy of the creators and buyers of NFT-Patent. Without verification in the authentication layer, NFT-Patent is only a tool to prove ownership of an NFT-Patent and opens opportunities for Patent infringement.

Self-sovereign Identity (SSI) is a solution to solving problems at this authentication layer because SSI is a series that will guide automatically in finding identity.[46] With SSI's focus on privacy and the interaction between two or more security application systems, SSI can use cryptography to obtain identity continuously and selectively. Moreover, blockchain technology is a technology that is transparent and provides Know Your Customer (KYC) benefits. This SSI solution has also been used in solving problems in smart cities[47] and the Internet of Things (IoT).[48] The process and flow of this authentication decentralization can be presented in the following chart:

46 Swapna Krishnakumar Radha dkk., "Verifiable Badging System for Scientific Data Reproducibility," *Blockchain: Research and Applications* 2, no. 2, 2021: 115.without revealing sensitive details associated with the same. We conclude that by integrating smart contracts, blockchain technology, and self-sovereign identity into an automated system, it is possible to assert the quality of scientific materials and validate the peer review process without the need of a central authority.","container-title":"Blockchain: Research and Applications","DOI":"10.1016/j.bcra.2021.100015","ISSN":"2096-7209","issue":"2","journalAbbreviation":"Blockchain: Research and Applications","language":"en","page":"100015","source":"ScienceDirect","title":"Verifiable Badging System for scientific data reproducibility","volume":"2","author":[{"family":"Radha","given":"Swapna Krishnakumar"},{"family":"Taylor","given":"Ian"},{"family":"Nabrzyski","given":"Jarek"},{"family":"Barclay","given":"Iain"}],"issued":{"date-parts":[["2021",6,1]]}}],"schema":"https://github.com/citation-style-language/schema/raw/master/csl-citation.json"}

47 Mohamed Tahar Hammi, Patrick Bellot, dan Ahmed Serhrouchni, "BCTrust: A decentralized authentication blockchain-based mechanism," dalam *2018 IEEE wireless communications and networking conference (WCNC)*, IEEE, 2018, 1–6.

48 Umair Khalid dkk., "A Decentralized Lightweight Blockchain-Based Authentication Mechanism for IoT Systems," *Cluster Computing* 23, no. 3, 2020, 2067–87.

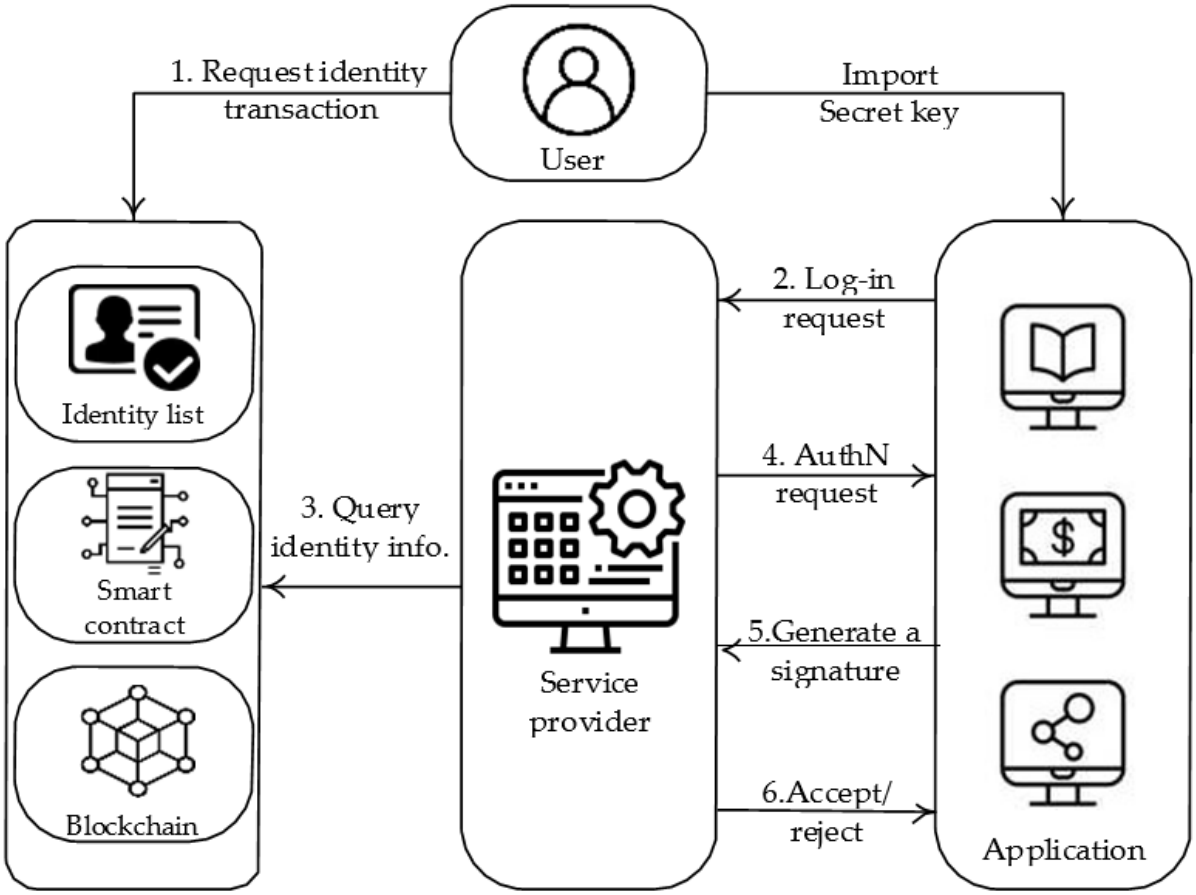


Figure 2. Flow of NFT-Patent Decentralization [49]

In the Log-in section, the user performs identity information and imports the secret key into the service provider, then the service provider analyzes the log-in request, and the user submits a request for a list of identities (buyer identity). Then, the service provider responds to the request and provides the user's time and signature. After the process of providing time and signature information is complete, the service provider analyzes the validation and eligibility of the buyer's identity, and if the buyer's identity is valid, then the authentication is successful, but if the buyer's identity is invalid, then the authentication will fail.[50]

The next layer is the verification layer which is the NFT-Patent publication layer on the blockchain which will be re-verified by the validator or service provider and then forwarded with feedback checking whether the NFT-Patent was received or not. After the process is received, the patent is given a mint, and then the mint will be distributed via NFT-Patent on the blockchain. Then, it is passed to the blockchain layer, which will manage and identify NFT-Patent that have been minted. In this verification layer, the NFT-Patent service provider uses the blockchain layer to protect Patents. The last layer is the application layer which is the application layer and the use of NFT-Patent as a medium for the Patent market by several government agencies, universities, Patent organizations, and the granting and funding of a Patent.[51]

49 Bamakan et al., "A Decentralized Framework for Patents and Intellectual Property as NFT in Blockchain Networks," 7.

50 Seyed Mojtaba Hosseini Bamakan, Nasim Nezhadsistani, Omid Bodaghi, and Qiang Qu. "A Decentralized Framework for Patents and Intellectual Property as NFT in Blockchain Networks," 2021., 8.

51 Bamakan dkk, "A Decentralized Framework for Patents and Intellectual Property as NFT in Blockchain Networks," 6.

Based on the description above, in the design of the implementation of the NFT-Patent concept, two suggestions can be considered by the Director General of Intellectual Property Rights. First, the Director General of Intellectual Property Rights can work together with services that offer Blockchain systems, such as IPwe, in carrying out the framework previously described so that the NFT-Patent administration process will be run and controlled by a third party in carrying out the NFT-Patent tokenization process. This is also in line with IPwe's plan to collaborate in the administrative processes of several state jurisdictions to run Blockchain-based NFT-Patent services.[52] Second, the Director General of Intellectual Property Rights can develop a system starting from the digital patent registration process, the principle of recognizing service users before patents are traded and tokenized into NFT, to the buying and selling process at marketplaces.

The Concept of the NFT-Patent Online Marketplace Regulation in Indonesian Statutory Regulations

Conventional Patent Transition Period to NFT-Patent

It would be irrational if NFT-Patent were applied simultaneously and comprehensively without a clear and socialized transition mechanism. Therefore, an effective and efficient transition process is needed on an ongoing basis.

The NFT-Patent market platform will continue to be managed by the Directorate General of Intellectual Property as the sole entity managing IPR in Indonesia. In the process of transitioning from conventional patents to NFT-Patent, the Directorate General of Intellectual Property can refer to policies that were previously issued by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency of the Republic of Indonesia (ATR/BPN RI). The ATR/BPN RI had used the Ministerial Regulation instrument, namely the ATR/BPN RI Ministerial Regulation Number 1 of 2021 Concerning Electronic Certificates (Permen ATR/BPN RI 1/2021), as a transition process from land certificates which were originally in physical form to electronic land certificates. Therefore the NFT-Patent transition process will also be regulated through a ministerial regulation, namely the Regulation of the Minister of Law and Human Rights (Permenkumham).

The Directorate General of Intellectual Property needs to issue special Statutory Regulations such as Permen ATR/BPN RI 1/2021, which regulates the transition process from conventional patent certificates to blockchain-based electronic patent certificates. Based on a comparison with the policy on land certificates in electronic form at the ATR/BPN RI, the government can first explain in CHAPTER I General Provisions of the NFT-Patent Ministerial Regulation regarding what is a blockchain-based electronic certificate. That way, the legality of blockchain-based electronic certificates can be conceptualized as a framework and sound provisions so as to create legal certainty. This provision also needs to be emphasized regarding the limitation of the government's role as regulator and manager of the NFT-Patent market platform and not as a patent holder.

The NFT-Patent transition will be divided into three parts. First, since the enactment of the NFT-Patent policy in Indonesia, patent applications submitted after the NFT-Patent is enforced will be made through the NFT-Patent market platform. Second, patent applications that were submitted before this policy was enacted will still result in conventional patents. Third, conventional patents will remain valid and be maintained while the transition process to NFT-Patent is in progress so that later all patents in Indonesia will be in the form of NFT-Patent.

Conventional Patent Post Transition Advanced Arrangements

When most of the patents are in the form of NFT-Patent, the government needs to update a number of Statutory Regulations regarding patents to adapt to the situation and conditions. The government must renew the 2016 Patent Law and all the implementing regulations under it. NFT-Patent arrangements must be rigidly

52 Mia Mixan, "Blockchain and IP: Introducing The Future of Intellectual Property," IPwe, April 10, 2023, https://ipwe.com/blockchain-and-ip-introducing-the-future-of-intellectual-property/.

regulated in the new Patent Law. Apart from that, in CHAPTER II of the Patent Law, it is necessary to add provisions for grouping purposes for using inventions. The Patent Law must use the Separation Principle by separating the purposes of using inventions into 3, namely consumption, production, and innovation.[53] In this case, the patent law must provide more incentives for the use of inventions aimed at creating new innovations, such as research and development. Meanwhile, for consumption and production purposes, the Patent Law must reduce incentives by imposing additional costs.

There is an urgency to implement the NFT-Patent marketplace in the Patent Law. First, the offensive reason as an effort to maximize economic benefits from patents by expanding market share while creating an integrated patent commercialization ecosystem. Second, defensive reasons, as an effort to protect patents and not prohibit the use of a technology to maximize public services. The technologies referred to in this defensive discussion are blockchain technology and NFT. Third, for reasons of synergy/collaboration, synergy is needed between several companies in the patent sector and government agencies to form an ideal patent ecosystem.

4. CONCLUSION

So far, Indonesia's positive law has not specifically regulated NFT, but based on PBI No. 18/40/PBI/2016, Permendagri 99/2018, and CoFTRA Regulation 5/2019, NFT can be categorized as a crypto commodity. In addition, NFT is also classified as taxable goods and tax objects by the VAT Law, the Non-Tax State Revenue Law, and the Income Tax Law. Whereas in NFT arrangements in other countries, such as Italy, NFT is treated the same as other crypto assets On the contrary, in the European Union, NFT is not categorized as crypto assets. Furthermore, Australia and America, through DTA and NIST, pragmatically enforce NFT for tax purposes. Unlike other countries, Germany has specifically regulated NFT in its Banking Law so that it can be transacted as a financial instrument. Based on their material nature, NFT and Patents can be classified as intangible movable objects. The transfer of NFT-Patent through marketplaces must be in accordance with the Patent Law and Government Regulation on Patent Transfer. In addition, NFT-Patent transactions can be carried out based on the principle of freedom of contract and are valid transactions as long as they comply with the provisions of Article 1320 of the Civil Code and Article 46 paragraph (2) PP 71/2019. After the NFT-Patent marketplace is enforced, there is a transition period to socialize NFT-Patent and ensure that there is no loss from the owner and the patent applicant when this policy is enacted. The NFT-Paten market platform will be managed by the Directorate General of Intellectual Property, which is regulated through Permenkumham. After most of the patents have been converted into NFT-Patent, updates to the Patent Law and all its implementing regulations must be made to suit the existing needs and conditions.

In line with the conclusions that have been presented, the authors in this study provide several recommendations related to the implementation of NFT-Patent in marketplaces in Indonesia. First, the Government of the Republic of Indonesia needs to regulate NFT specifically in statutory regulations and use it to maximize public services, especially patent management. Second, the Government of the Republic of Indonesia, through DGIP, needs to cooperate with technology companies that focus on developing patent ecosystems, such as IPWe, in order to organize a world-class patent ecosystem and improve patent security and benefits. Third, the Government of the Republic of Indonesia must strive to collaborate with universities and industrial companies in terms of developing patents to increase the nation's competitiveness in the field of technology sustainably.

53 Robert D. Cooter and Uri Y. Hacohen, "Progress in the Useful Arts: Foundations of Patent Law in Growth Economics," *Yale JL & Tech.* 22, no. 1 (2020): 254.

REFERENCES

"Global Innovation Index 2021." Geneva: World Intellectual Property Organization, 2021. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf.

"World Intellectual Property Indicators 2021." Geneva: World Intellectual Property Organization, 2021. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_941_2021.pdf.

Agency, Digital Transformation. "Blockchain Overview: Australian Government Guide." Collection. Commonwealth of Australia, February 12, 2019. Australia. https://www.dta.gov.au/help-and-advice/technology/blockchain/blockchain-overview-australian-government-guide.

Ardani, Alif Muhammad. "Penghapusan Paten Terdaftar Di Indonesia: Perkembangan Dan Penyebabnya." Undang: Jurnal Hukum 2, no. 1 (2019): 147–168.

Bamakan, Seyed Mojtaba Hosseini, Nasim Nezhadsistani, Omid Bodaghi, and Qiang Qu. "A Decentralized Framework for Patents and Intellectual Property as NFT in Blockchain Networks," 2021.

Bamakan, Seyed Mojtaba Hosseini, Nasim Nezhadsistani, Omid Bodaghi, dan Qiang Qu. "Patents and intellectual property assets as non-fungible tokens; key technologies and challenges." Scientific Reports 12, no. 1 (2022): 1–13.

Barakat, Samer, Khalil Yaghi, dan Hanady Al-Zagheer. "The Use of NFT for Patent Protection." Advances in Dynamical Systems and Applications 17, no. 1 (2022): 107–13

Calista, Dhiya, Al Farissi, and Mastura Diana Marieska. "Sistem Pengamanan Data Menggunakan Kriptografi AES dan Blockchain Berbasis Android." JUPITER (Jurnal Penelitian Ilmu dan Teknologi Komputer) 13, no. 2 (October 25, 2021): 220–26. https://doi.org/10.5281/3927.jupiter.2021.10.

Chohan, Raeesah, and Jeannette Paschen. "What Marketers Need to Know about Non-Fungible Tokens (NFTs)." Business Horizons 18, no. 1 (2021).

Chui, Wing Hong, and Mike McConville. Research Methods for Law. Edinburgh: University Press Edinburgh, 2007.

Di Bernardino, Claudia, Andres Chomczyk Penedo, Joshua Ellul, Agata Ferreira, Axel von Goldbeck, Robert Herian, Alireza Siadat, and Nina-Luisa Siedler. "NFT-Legal Token Classification." In EU Blockchain Observatory and Forum NFT Reports. The Open University, 2021.

Direktorat Jenderal Kekayaan Intelektual. "Laporan Tahunan Direktorat Jenderal Kekayaan Intelektual 2020." Jakarta: Kementerian Hukum dan Hak Asasi Manusia, 2020.

Efendi, Aan, Dyah Ochtorina Susanti, and Rahmadi Indra Tektona. Penelitian Hukum Doktrinal. Yogyakarta: LaksBang Justitia, 2019.

Fried, Charles. Contract as Promise: A Theory of Contractual Obligation. Oxford University Press, 2015.

Fuady, Munir. Konsep Hukum Perdata. Cetakan ke-4. Jakarta: Raja Grafindo Persada, 2019.

Giesselman, Nathan W., Carl R. Erdmann, David Berke, and Martin de Jong. "Proliferation of NFT Transactions Raises Numerous US Tax Questions." The Contemporary Tax Journal 10, no. 2 (2021): 6.

Hammi, Mohamed Tahar, Patrick Bellot, and Ahmed Serhrouchni. "BCTrust: A Decentralized Authentication Blockchain-Based Mechanism." In 2018 IEEE Wireless Communications and Networking Conference (WCNC), 1–6. IEEE, 2018.

Hertz, Kate. "Know the Difference: On-Chain and Off-Chain NFTs," 2021. https://www.one37pm.com/nft/tech/on-chain-and-off-chain-nfts.

Khalid, Umair, Muhammad Asim, Thar Baker, Patrick C. K. Hung, Muhammad Adnan Tariq, and Laura Rafferty. "A Decentralized Lightweight Blockchain-Based Authentication Mechanism for IoT Systems." Cluster Computing 23, no. 3 (September 1, 2020): 2067–87. https://doi.org/10.1007/s10586-020-03058-6.

Machlup, Fritz. An Economic Review Of The Patent System. 15. US Government Printing Office, 1958.

Marzuki, Peter Mahmud. 2016. Penelitian Hukum. Jakarta: Prenadamedia Group.

Maier, Erik, and Jaap Wieringa. "Acquiring Customers through Online Marketplaces? The Effect of Marketplace Sales on Sales in a Retailer's Own Channels." International Journal of Research in Marketing 38, no. 2 (2021): 311–28.

Mayana, Ranti Fauza, Tisni Santika, Moh Alvi Pratama, dan Ayyu Wulandari. "Intellectual Property Development & Komersialisasi Non-Fungible Token (NFT): Peluang, Tantangan dan Problematika Hukum Dalam Praktik." ACTA DIURNAL Jurnal Ilmu Hukum Kenotariatan 5, no. 2 (2022): 202–20.

Mougayar, William. The Business Blockchain: Promise, Practice, and Application of the next Internet Technology. John Wiley & Sons, 2016.

Muchtar, Helitha Novianty, An An Chandrawulan, Miranda Risang Ayu, and Muhamad Amirullloh. "Urgensi Pengaturan Valuasi Paten Untuk Start Up Dalam Rangka Meningkatkan Perekonomian Di Era Industri 4.0." Jurnal Bina Mulia Hukum 6, no. 1 (September 30, 2021): 84–102. https://doi.org/10.23920/jbmh.v6i1.170.

Radha, Swapna Krishnakumar, Ian Taylor, Jarek Nabrzyski, and Iain Barclay. "Verifiable Badging System for Scientific Data Reproducibility." Blockchain: Research and Applications 2, no. 2 (June 1, 2021): 100015. https://doi.org/10.1016/j.bcra.2021.100015.

Samsudin, Dadan. Hak Kekayaan Intelektual Dan Manfaatnya Bagi Lembaga Litbang. Jakarta: Direktorat Jenderal Kekayaan Intelektual Kementerian Hukum dan Hak Asasi Manusia, 2016.

Savelyev, Alexander. "Some Risks of Tokenization and Blockchainizaition of Private Law." Computer Law & Security Review 34, no. 4 (2018): 863–69.

Sichelman, Ted. "Commercializing Patents." Stanford Law Review 62, no. 2 (January 2010): 341.

Surden, Harry. "Computable Contracts." UCDL Rev. 46 (2012): 629.

Swan, Melanie. Blockchain: Blueprint for a New Economy. O'Reilly Media, Inc., 2015.

Tessema, Frazer A., Aaron S. Kesselheim, and Michael A. Sinha. "Generic but Expensive: Why Prices Can Remain High for off-Patent Drugs." Hastings LJ 71, no. 4 (2019): 1019.

Thomas M. Isaacson. Patents and Blockchain Innovation: Strategic Approaches to Intellectual Property. Canada: Blockchain Research Institute, 2018.

Wang, Qin, Rujia Li, Qi Wang, and Shiping Chen. "Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges." ArXiv Preprint ArXiv:2105.07447, 2021.

Yaga, Dylan, Peter Mell, Nik Roby, and Karen Scarfone. "Blockchain Technology Overview." Gaithersburg, MD: National Institute of Standards and Technology, October 2018. https://doi.org/10.6028/NIST.IR.8202.

Yanisky-Ravid, Shlomit, and Edward Kim. "Patenting Blockchain: Mitigating the Patent Infringement War." Alb. L. Rev. 83 (2019): 603.

JIKH Volume 17, Num. 2, July 2023: 165-182
p-ISSN: 1978-2292 e-ISSN: 2579-7425