



VALUATION OF INTELLECTUAL PROPERTY ON NFT TRANSACTION FOR NFT PLATFORM IN INDONESIAN PERSPECTIVES

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ABSTRACT

Recently, NFT enable its owner to sell and buy intellectual properties. The research result shows that an NFT transaction process – such as in the sale and purchase of intellectual property-requires a determined price valuation. The authors consider that it is necessary to determine a clear valuation to predict the exact price of the intellectual property digitally transacted on NFT. The price database on NFT can be used to determine the price by first collecting the NFT and the price database can also calculate the value of the NFT in the future.

Keywords: nft; intellectual property; valuation.

I. INTRODUCTION

NFT rose to prominence in April 2021, when work from a renowned neo-expressionist artist, Jean-Michel Basquiat gained public interest. It was said that there was a potential dispute over his work. “Free Comb with Pagoda,” since Daystorm – the small firm that sold the drawing was suspected to have neither license nor copyright for their actions in putting the drawing onto public bid and give a right to the winner to destroy the original physical copy. Basquiat had died in 1988 in his prime, after his death, his estate was administered by his father, until 2013, and then it was continued by his sisters afterward. The licensing agent handling Basquiat’s work affirmed that Basquiat’s estate never conveys license or copyright to parties other than itself. Hence, the trading of his unique and artistic works – which by its fact involve large sums of money, is inciting public debate.¹

As such, NFT became a hype, notably in the field of art, it gives the possibility for people to own digital files of artwork while simultaneously destroying the original, if they so desired. But obviously, art enthusiasts – including the art licensing body that manages Basquiat's artwork are at rage and strongly against this notion.²

From Basquiat, many other examples come to follow, not long ago, an art collector bought a copy of Banksy's work, burned the original, and turned the digital copy into an NFT. Another example, is the viral video showing a baby biting his brother's finger, known as 'Char-lie Bit Me', it was sold as NFT for USD 500,000, with the video taken off from the internet after the sale has ended.³ What exactly is NFT? How exactly its valuation can determine the price of a work? This article will answer both

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¹ Andres Guadamuz, ‘The Treachery of Images: Non-Fungible Tokens and Copyright’ (2021) 16 *Journal of Intellectual Property Law & Practice* 1367.

² The art Newspaper, ‘A Shaw, ‘Basquiat NFT Withdrawn from Auction after Artist’s Estate Intervenes.’ 28 April (2008) <<https://www.theartnewspaper.com/news/basquiat-nft-withdrawn-from-auction-after-artist-s-estate-intervenes>>.

³ News BBC, ‘Z Kleinman, “Charlie Bit My Finger Video to Be Taken Off YouTube after Selling for £500,000”’ 24 may (2021) <<https://www.bbc.co.uk/news/newsbeat-57227290>>.

questions from a legal perspective, with the help of abundant technical explanations. The number of emerging NFT platforms makes the author want to provide input and at the same time take advantage of the emergence of government regulation number 24 of 2022, with the valuation in NFT it is expected that digital copyrights can be used as collateral.

II. DISCUSSION AND RESULT

1. NFT Transaction

1. Non-Fungible Token

Despite that NFT's use case was pioneered by the digital transformation of artworks, however, to consider that NFT is solely defined as digital art is a misinterpretation. In fact, discussion on NFT will always involve matters concerning cryptocurrencies, smart contracts, and blockchain (commonly known as Distributed Ledgers⁴. (DLTs) Blockchain is a distributed and decentralized cryptography ledger, that is made available to the public by adding immutable information and records. DLT uses a non-proprietary underlying technology, any person can either create and run their network or join pre-existing one.⁵ In other words, blockchains, including ethereum, shall also be included in the discussion.

Different from bitcoin with its promise of online currency secured from government's intervention – NFT is a particular digital asset or token, that can be proven unique and cannot be exchanged with other digital asset or token. From this understanding, its uniqueness speaks for itself why it can be easily seen by anyone. Aside from functioning as information embedded to an asset, NFT may as well work as a digital asset,⁶ as it is created under specific framework or standard using an on-chain. NFT has many features, among them, ethereum is one of the most widely used. There are many services possibly produced from ethereum, one of which is Ethereum Request for Comment ('ERC'). ERC is a form of smart contract that enable its users to access information on creating, issuing and distributing a blockchain. This way, NFTs can be managed, traded and owned following the framework property or protocol as specified according to the issuing property and following the smart contract entered into by the registrant.⁷

Ethereum shares common characteristics with other NFTs, such as (1) uniqueness, (2) transparency – profitability of ownership; (3) immutability of archiving and the (4) asset program capability. In terms of first, uniqueness and specificity, the characteristic of NFT lies on the limitation of its individual token. People can also find that NFT is either artificially, numerically or historically scarce. Artificial scarcity refers to its rarity of code or publishing specification. Since numerical aberration is related to artificial, thus, it is relative to range. Meanwhile, historical scarcity refers to significant historic element in an NFT's work⁸. The example of historical element in an NFT is the part of Cryptopunks' allure, which is considered as one of the first generative NFTs ever issued, and thus – unique in that sense.⁹

The following characteristic is the transparency and profitability of the ownership. For NFT that has a tangible asset in the real world, proof of ownership becomes the basis underlying the possession of assets, aside from the potential of fractional ownership.¹⁰ Immutability is the next characteristic,

⁴ Julia Hugendubel, 'Blockchain Technology and Intellectual Property – A Basic Introduction' (2021) 1 International Journal of Cryptocurrency Research 5.

Kevin Werbach, (*Information Policy*) Kevin Werbach - *The Blockchain and the New Architecture of Trust-The MIT Press (2018)* (Sandra Braman ed, The MIT Press 2018).

⁶ European Commission, 'Demystifying Non-Fungible Tokens (NFTs)' (2021).

⁷ By Amanda E Schreyer and Peter F Cifichiello, 'NFT Basics Explained' 1.

⁸ Hugendubel (n 4).

⁹ Juliet M Moringiello and Christopher K Odinet, 'The Property Law of Tokens' [2021] SSRN Electronic Journal 1.

¹⁰ Industry Cryptoart, 'In CryptoArt Industry Non-Fungible Tokens (NFT) Understanding'.

where quality assurance inherent in all blockchain-based tokens may generate advantage to the NFT. Information embedded in the token is impervious to tampering without the compromise of the blockchain protocol's owner, in time, it will be resulting into substantial trust and transparency. Lastly – program capability of the assets, many considered this as an important differentiating factor that separates NFTs from the real-world assets. In addition to supporting artistic or business expressions, NFTs are as programmable as the software. Additionally, practical applications demonstrate how NFTs can be used as collateral in many DeFi applications, similar to mortgages.¹¹

Ethereum is considered as the most popular token on NFT, its standard setting token is ERC-20 that has rules on equivalence and value. Many non-exchangeable tokens often consist of digital records and conversion in such forms.¹² The NFT transactions were less than 1 million in the beginning of the year, but in August 2021, NFT users reached its peak with 5 million transactions of sales. This dynamic remains until the beginning of 2022, where the number of NFT sales reached 1.3 million transactions in February.

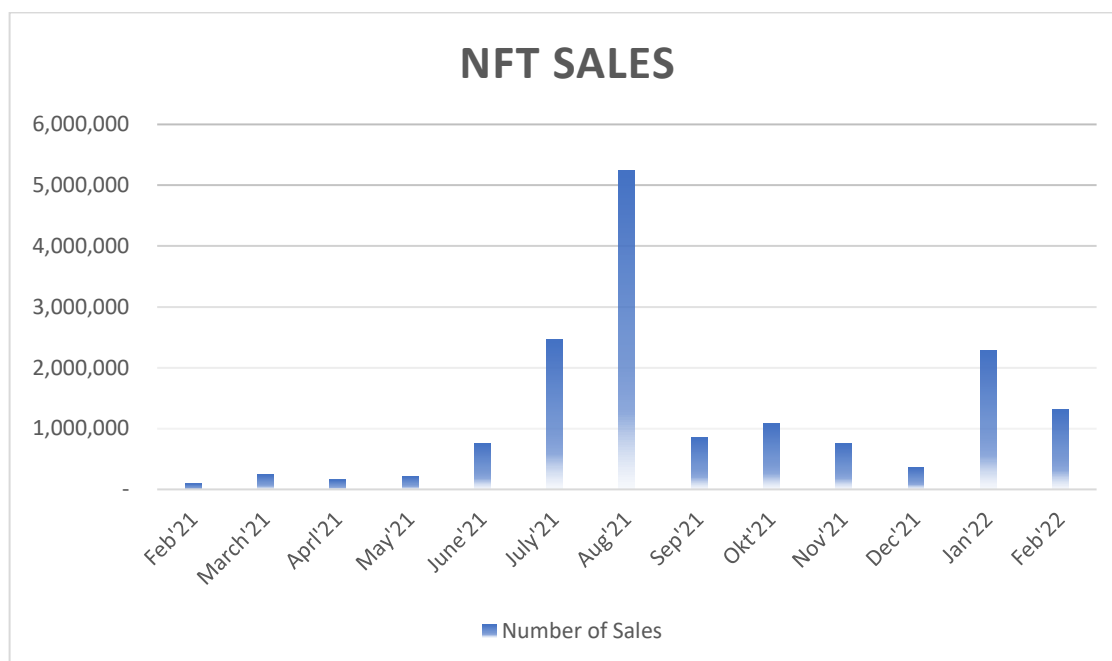


Figure 1: NFT Sales in 2021-2022

Source: nonfungible.com

In carrying out transactions through NFT, one shall required to be aware on the technical knowledge regarding how NFT works and the relevant processes involved within.

2. Smart Contract

In NFT, smart contracts are taking role to store unique information, such as ownership and transaction details¹³. Creators can add identities, secure links to files, and many more into the smart contracts within the NFT. Besides, they can also define specific rules on the NFT trading – for example,

¹¹ Commission (n 6).

¹² AA Dolganin, 'Non-Fungible Tokens (NFT) and Intellectual Property: The Triumph of the Proprietary Approach?' (2021) 2 Digital Law Journal 46.

¹³ Katharina Loeber, 'Big Data, Algorithmic Regulation, and the History of the Cybersyn Project in Chile, 1971-1973' (2018) 7 Social Sciences.

the royalty percentages received for each subsequent sale. Aside from making each NFT unique and valuable,¹⁴ smart contracts enable creators or developers to specify the terms & conditions of NFT they want – for example, special rights granted to a specific group of people within certain NFT projects. This feature includes capability of exclusive access to drop for early supporters, gain prizes for participating in contests, lower minting fees for subsequent reductions, breeding collection, and many more¹⁵.

Smart contract explains all information on NFT in detail, by reading it, people is supposed to have better understanding to the NFT, either concerning the popularity of a project, ownership rights, details of transactions, or many others; it can even print NFTs directly.¹⁶

Within smart contracts, parties who do not recognize each other and participants in a decentralized system who entered into agreements without third parties; they usually propose a unified method engineered to build applications in various industries. The applications operated on top of smart contracts usually based on state transition mechanisms. The participants may share status containing instructions and parameters to ensure transparent implementation.¹⁷ The smart contracts itself usually used in most NFT activities to ensure that the transactions executed as agreed.¹⁸

3. Intellectual Property on NFT

NFT helps intellectual property commodities such as art, games, collections and many more to find path in digital sales, at times, with unreasonable and unpredictable price. In its own way, NFT has become a new channel to motivate intellectual property owners to be more productive¹⁹. Due to NFT's unique aspects, intellectual property owners need to recalculate their strategy in protecting and licensing the respective rights attached to their works²⁰. The IP protection strategy should include specific safeguards relating to NFTs.²¹

Many people assume that a sale of an artwork in the form of NFT will subsequently sell the same in its real form. However, in reality, this is not the case, sale and purchase in NFT signifies exchange of value to the digital records of the work only. NFT buyers spend a vast sums of money to buy metadata files and short strings of numbers and letters. It is indeed dubious in artistic value, however, that is the very hallmark of NFT.²² Despite of that fact, NFT transactions are supposedly still involve matters on the transfer of rights, especially digital copyrights managed by digital managements. In Indonesia for example, the Copyright Law obligating any transfer of copyright to be "in writing ..., signed by, or on behalf of the person granting the rights." There is a grey area in this regard, since in case of transfer of rights, most of NFT transactions are having a hard time to comply with the statutory regulations. It isn't

¹⁴Elizabeth Howcroft, 'NFT Sales Hit \$25 Billion in 2021, but Growth Shows Signs of Slowing' (*Reuters*) <<https://www.reuters.com/markets/europe/nft-sales-hit-25-billion-2021-growth-shows-signs-slowng-2022-01-10/>> accessed 19 February 2022.

¹⁵N Szabo, 'Smart Contracts: Building Blocks for Digital Markets' (1996) 16 *EXTROPY: The Journal of Transhumanist Thought*.

¹⁶*ibid.*

¹⁷Qin Wang and others, 'Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges' <<http://arxiv.org/abs/2105.07447>>.

¹⁸By Collin Starkweather, Izzy Nelken and Sam Miller August, 'How Intellectual Property Rights Can Complicate NFT Market'.

¹⁹Alexandra Fernandes and Luís U Afonso, 'Online Sales and Business Model Innovation in Art Markets: A Case Study' (2020) 9 *Social Sciences*.

²⁰Hugendubel (n 4).

²¹Seyed Mojtaba Hosseini Bamakan and others, 'Patents and Intellectual Property Assets as Non-Fungible Tokens; Key Technologies and Challenges' (2022) 12 *Scientific Reports* 0 <<https://doi.org/10.1038/s41598-022-05920-6>>.

²²Moringiello and Odinet (n 9).

easy to judge whether digital form of work as NFT can meet with and corresponds to the legal requirements and formalities required in transferring copyrights.²³

Recognition of intellectual property rights goes into a whole different level after registration, it is not a new fact however, that its process in Indonesia is lengthy due to the existing bureaucracy system. Application of patents and trademarks may take years while securing copyright may take months. NFT may speeding up this process with a considerable confidence and assurance, that it may as well works as a mean of recording and protecting intellectual property's ownership.²⁴ This realization comes from the fact that blockchain is a place where people record ownership of works, it cannot be changed easily and hence may act as a verification method against the authenticity of a copyrighted work. Transfer of ownership in blockchain is also controlled and traceable, making NFT becomes a possible exciting concept in the field of intellectual property.²⁵ The help from unique features in NFT technology possibly offer alternate protection to intellectual property applicants while they are waiting for the formal protection from the governmental institution. NFT ease the sale and purchase cycle, where creators have better chance, access and opportunities of earning money from their works. Blockchain also record transaction, it is capable of tracking intellectual property's ownership and may also facilitate patent's acquisition by democratizing intellectual property's licensing process.²⁶ NFT system in embedding automated royalty collection in each work is supporting intellectual property market in a way, and provide inventors with financial benefits whenever their innovations are licensed.²⁷

When purchasing an NFT, one's ownership of a unique digital version of the underlying work or asset will be recorded in a token. When the NFT is transferred to someone else, the digital version of the underlying work or asset will also transferred along with it.²⁸ In most NFT issuances to date, it seems that there is a clear intention from the seller to not to procure ownership interest to the underlying asset. In other words, buying NFT is considered as equivalent to buying physical artwork, which rarely involves the subsequent transfer of the copyright.²⁹

With respect to the underlying work in NFT, the original creator has the exclusive right to both retain the copyright and take specific actions concerning the underlying works limited by it, for instance – making additional copies, distribute, display or sell the works to other parties.³⁰ When purchasing an NFT, one shall receive a token typically attached with the right to use a unique digital version of the embedded work for personal use, and to resell the copies of the work.³¹

The use of right granted to the buyers will be determined by the terms and conditions of the applicable license granted upon the NFT acquisition, which will be varied one another in each token. According to this fact, NFT companies or managers may enforce a more permissive terms and conditions in their licenses, that may allow him to access a broader range of rights to exploit the unique digital versions of the acquired work in the respective NFT.³²

Some jurisdictions have recognized certain crypto assets as qualifying "property" (rights "in-rem"), however, the question will be, whether the courts will identify NFT as the proof of legal

²³Schreyer and Cifichiello (n 7).

²⁴Cryptoart (n 10).

²⁵(James G. Gatto, et al, 2021)

²⁶Andres Guadamuz, 'Non-Fungible Tokens (NFTs) and Copyright' [2021] Wipo Magazine.

²⁷The art Newspaper (n 2).

²⁸Seyed Mojtaba and others, 'A Decentralized Framework for Patents and Intellectual Property as NFT in Blockchain Networks' 0 <<https://doi.org/10.21203/rs.3.rs-951089/v1>>.

²⁹Arnav Kapoor and others, 'TweetBoost: Influence of Social Media on NFT Valuation' <<http://arxiv.org/abs/2201.08373>>.

³⁰Commission (n 6).

³¹Starkweather, Nelken and August (n 18).

³²Dolganin (n 12).

ownership of digital versions of linked assets or not³³. Technically, NFT holders only have a unique set of numbers that amount to tokens in their electronic wallet, it allows them to decide where or to whom the NFT should be transferred. Arguably, it creates a factual control to the related assets that is similar to property rights. The logic behind this is the capability of the token to proof the originality of digital copy of the underlying images, sounds or texts embedded in the NFT.³⁴

Despite its possibility to become an alternate intellectual property protection, NFT does not necessarily transfer copyright. Therefore, NFT buyers in this regard, have an unclear scope of rights' enforcement. This fact is raising question, whether NFT buyers can ask the original author to take action against someone who has created an unauthorized version of the underlying content? If for instance, someone forge the NFT, who will or can take action against him? Besides, given that the copyright remains attached to the original creator, what if he then publishes more versions of the NFT, which increase the availability of the asset? In this case, the NFT may have its market value reduced, and may as well seen as non-beneficial factors for the buyers.³⁵

2. Intellectual Property Valuation on NFT

1. Intellectual Property Valuation

NFT may at times sold in unreasonable price, people will surely wonder, where does this price comes from and how to measure the value of the assets – if there is any valuation method exist from the first place. Before going to NFT valuation, one must firstly understand the gist behind intellectual property valuation. It is just as important, since most underlying assets in NFT involve man-made works that automatically entangled with intellectual property.

Basically, valuation³⁶ is the act of estimating or assigning monetary or other value to a matter – whether physical or non-physical, tangible or intangible. As an intangible matter, intellectual property relatively has an hassle-free valuation method, since it is already formally protected under either trademarks, patents, or copyrights. It is possible to trade them in unregulated market. Valuation involves the process of identifying and measuring the financial benefits of an asset,³⁷ it contains of two concepts. First, the narrow sense, the process of calculating the financial value of an asset which shall be resulted into "price." Second, the broader sense, the process of understanding the importance of intellectual property in a business and the process of managing intellectual property for the purpose of acquisition and exploitation.³⁸ Intellectual property owners, especially for patents, usually need a valuation to calculate or determine the value of their intangible assets.³⁹ There are three available methods commonly used to this date (i) market-based, (ii) cost-based or based on past and future economic benefits, and (iii) revenue approaches, as might be explained below.

³³ Bogdan Radu, 'Non-Fungible Tokens (NFTs) - Regulation Vacuum and Challenges for Romania'.

³⁴ Starkweather, Nelken and August (n 18).

³⁵ Dolganin (n 12).

³⁶ Marilei Osinski and others, 'Methods of Evaluation of Intangible Assets and Intellectual Capital' (2017) 18 Journal of Intellectual Capital 470 <<https://doi.org/10.1108/JIC-12-2016-0138>>.

³⁷ Gio Wiederhold, *Valuing Intellectual Capital: Multinationals and Taxhavens* (2014) <<http://ezproxy.uniandes.edu.co:8080/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cat00683a&AN=udla.687930&lang=es&site=eds-live&scope=site%5Cnhttp://ezproxy.uniandes.edu.co:8080/login?url=http://dx.doi.org/10.1007/978-1-4614-6611-6>>.

³⁸ Philip R Fink, *The Handbook of Business Valuation and Intellectual Property Analysis*, vol 36 (2005) <<http://content.ebscohost.com/ContentServer.asp?T=P&P=AN&K=18187026&S=R&D=bth&EbscoContent=dGJyMMv17ESep7E4v%2Bv1OLCmr0qep7BSsqa4SLeWxWXS&ContentCustomer=dGJyMPGnrlG1rrBMuePfgex44Dt6fIA%5Cnhttp://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=18187>>.

³⁹ Ruth Taplin, 'Intellectual Property Valuation and Innovation: Towards Global Harmonisation' [2013] Intellectual Property Valuation and Innovation: Towards Global Harmonisation 1.

2. Market-Based Approach

Intellectual property and intellectual capital are generally not developed for sale, even in case of trade, the value in the marketplace often represent only a tiny bit of a more significant transaction, where the details usually kept confidential. Thus, the market-based approach valuation in terms of intellectual property and intellectual capital is more of an assessment to the fair market value of an object within the same market, of course, the comparison is made with the same goods or the substitute.⁴⁰

Often times, appraiser is underlying their assessment by comparing intangible asset in question with the actual price people paid for similar assets with intellectual property or in similar circumstances. This method is popular in estimating an asset's fair value since it refers to transaction price or the multiplication of valuation implied in the transaction price of identical or similar assets in the market. The problem within this method however, is that it is usually challenging – almost impossible for the appraiser to find comparable deals. Since most intellectual property is made unique to a particular business entity, while intellectual capital does not represent presence of an tangible asset⁴¹.

3. Cost-Based Approach

The cost-based approach is determining the value of an asset according to the internal expansion or external purchase made against the development of works, it is based on the principle of substitution. Within the cost-based approach, there is a component called a replacement cost, which shows today's cost of purchasing the replacement for intangible asset that has a comparable utility provided by the same assets available in the market⁴².

Due to its potential failure in capturing the revenue projection from assets embedded with either intellectual property or intellectual capital, it is usually inappropriate to use this approach to determine real valuation of an asset. Replacement cost adjusted to the obsolescence of an intangible asset is capable of creating a hypothetical to the new intangible asset comparable to its predecessor. Instead of determining real valuation, this method is more appropriate to be used as a cross-checking tool or as a rational decision-making model, that can assist purchasing decisions of assets with intellectual property that have relatively short history.⁴³

4. Income-Based Approach

This approach values intellectual property assets based on the economic income they will most-likely generate or in short, intangible assets adjusted for current values. As there are many aspects related to the calculation of income, different type of measurement to the economic income may be applicable in this regard, for instance, the gross or net income, gross profit, net operating income, income before tax, net income after tax, operating cash flow, net cash flow, etc.⁴⁴ The most essential element in applying the income method is to ensure that the discount or the capitalization rate applied will be lowered consistently according to the economic income measurement.⁴⁵

The biggest challenge in applying this method is to estimate the revenue, setting a realistic discount rate and determining the reasonable life cycle of intangible assets and intellectual property assets. While the longevity of the intellectual property itself will be largely depending on many factors

⁴⁰Richard Razgaitis, *Valuation Dealmaking of Technology Based Intellectual Property* (2009).

⁴¹Fink (n 38).

⁴²Kapoor and others (n 29).

⁴³Wiederhold (n 37).

⁴⁴Naina Khanna, 'The Securitization of IP Assets: Issues and Opportunities' (2018) 23 *Journal of Intellectual Property Rights* 94.

⁴⁵Wiederhold (n 37).

such as technology obsolescence, revenue reduction, product life cycle, intellectual property's adaptability against dynamic in the market, etc. Since the factors are often far from subjective, it is necessary to assess inputs from those factors through the experience of a specialist.⁴⁶

In terms of estimating royalty rates, one must consider the comparability of the licensing transactions, notably the profitability and growth factors between the intellectual property subjects and the its comparison. Some transactions also have some kind of upfront and milestone payments that can tag along with the royalty payments; these valuation nuances should be considered before arriving at a comparable royalty rate applicable to a certain intellectual property subject.⁴⁷

In the income approach, the DCF method formula commonly used in the income approach is⁴⁸:

as follows:

$$PV = \sum_{t=1}^n \frac{CF(t)}{(1+r)^t}$$

PV = Present Value

CF = Cash Flow

r = Risk

t. = Time

Despite being common, the traditional methods as mentioned above have their own list of possible defects, which may limit their own effectiveness. These include, particular buyers, different negotiation skills, and the distorting effect of the peaks and troughs of economic cycles. Nonetheless, it is still helpful to have several valuation methodologies on hand, it may help to provide a rational basis to set fair price both to the intellectual property and the intellectual capital. However, intellectual capital is rarely valued or assessed through traditional valuation methods. Hence, the author believes that it is time for alternative assessment approaches to go to the surface.

5. Artificial Intelligence Valuation Intellectual Property for Price on NFT

The unpredictability of price and dependency on bargaining process at auction, are making NFT becoming both most sought after and much avoided commodity at the same time. While the former is mostly occurred to intellectual property owners seeking for huge profits overnight, the latter probably happened to many collectors. This unpredictability of price in NFT may either benefit or harm the buyers, they might buy at a high price, just to see it plunged when the popularity declines.

Since *its technology is difficult or impossible to duplicate*, NFT is unique and as a consequence, it is *valued* by people. It is renowned that *NFT is also a rare collector's item, which makes its price increase day by day*. Some people in *groups or communities are active in creating NFT that stands out from the rest*, for instance among celebrities and big brands. When they try to sell NFT, it will most likely to be a hit due to their *credibility and recognition*. It is then worth to note that building a community around credible and recognized *membership* in NFT *are also important*. Meanwhile, *people who invest early in artistic projects usually expect rewards and additional benefits* in return for their investment. *Fundamentally, human emotions and culture are driving the relevance and sensation* arising

⁴⁶Razgaitis (n 40).

⁴⁷Ahmad Jamal and Juwaidah Sharifuddin, 'Perceived Value and Perceived Usefulness of Halal Labeling: The Role of Religion and Culture' (2015) 68 Journal of Business Research 933 <<http://dx.doi.org/10.1016/j.jbusres.2014.09.020>>.

⁴⁸Osinski and others (n 36).

around the NFT projects. As a result, there is a bargaining process in determining NFT's price. At times, the cost of a work can be very expensive due to a high demand and increasing trend, making NFT's price relatively dynamic, and cost of a work does not always have a fixed price.

Based on the nature of its price, NFT can be categorized as veblen goods in digital form, whereby community plays a vital role in determining its value. According to Thorstein Veblen, (1899) "veblen effect" appears when consumers from the rich show a willingness to pay in a very high price for equivalent functions of goods and services that are conspicuous to advertise their wealth, thereby achieving more excellent social status. Veblen's writings have spawned a large amount of research on "prestige" or "status items,"⁴⁹ one of which is describing the "veblen effect" as mentioned earlier. The goods categorized as influenced by this effect are those commodities whose price increased in line with demand, it provides value as a form of social recognition to their owners. A simple example of veblen goods is Rolex, as a watch, it theoretically has less functionality than smartwatch, but people still buy it. It is a given since people do not buy Rolex to know the time but to gain public recognition.

Analogously, having an NFT at an expensive and illogical price gives the owner a firstclass recognition around his community. NFT's value may increase even more as investors and passionate fans discuss it in their community channels, for instance such as on Discord or Telegram, subsequent trade amongst themselves often follow. Style of language, interactions and jokes inside such community, are determining the possible price of an NFT. Those communities are keeping the wheels turning in driving the force behind the success of many NFT projects. They hold an important role in the growth sector, it increased sales volume up to \$10.7 billion in the third quarter of 2021.⁵⁰

Nevertheless, this uncertainty in NFT's price and valuation is influencing the essential value of the relevant work. Due to the absence of fixed or minimum price of a work, NFT's pricing becomes obscured. In time, this might harm NFT's owner when they invest to a work that might suddenly slumped in price. In this case, the author consider that a valuation method is still needed to give people some kind of manual in presuming the price calculation of a work. The conventional valuation methods as described above may be usable in this regard to evaluate works sold in NFT, among the 3 approaches, the market-based approach and the income-based approach are possibly the most appropriate to measure the value of the NFT.

6. Database For Market Based Approach on NFT System

Since the NFT system was born until the time the work to be evaluated was uploaded, there will be a lot of data that can be categorized based on its type or function in the NFT, this data can be used as a database to compare the prices of existing works and the works to be priced. Database of similar works and their prices are also important for consumers who will buy works so that consumers do not buy works that are too expensive and lead to losses.

In contrast to patents on NFT, which are dominated by copyright, the calculation does not focus on new technologies and life cycles because copyright only focuses on "original" works or not works uploaded in the NFT. Therefore, when recording works in NFT, detailed data must also be entered in the system, such as when the work was created, where the work was made, who made it, whether there is proof of copyright registration from the territory, whether or not the work is reproduced and so on. This data will be recorded in the NFT and become a database when there is data that is almost the same

⁴⁹Laurie Simon Bagwell and Douglas Bernheim, 'Veblen Effects in a Theory of Conspicuous Consumption' (2008) 86 *The New Palgrave Dictionary of Economics* 1.

⁵⁰Enevti HQ, 'The Reason behind Unreasonable NFT Price Tag' (2020) <https://medium.com/general_knowledge/the-reason-behind-unreasonable-nft-price-tag-b5fef34207ca>.

or similar, what is also important is the transaction price that has been carried out for a copyrighted work in the NFT is also important to be used as a database and informed to NFT users. Because the essence of the market base is to determine prices based on market prices, so the more data for similar works, the more valid the prices that will be used as references.

As discussed, one might measure NFT's value by comparing at least 2 similar works in using the market-based approach. Despite that it might be hard or nearly impossible to find similar works when intellectual property or intellectual capital are involved, however, this method might actually help to give the gist in estimating a work's valuation. Buyers as the party who submit demand, also have different interest from one another, they might have different judgment in mind for the same work. Likewise, intellectual property is often times uniquely attached to a particular business entity, while intellectual capital does not represent a concrete asset. In this regard, the goal is most likely unrelated to finding the similar work, yet to value a work based on how scarce a similar work is in the market. Rarity and uniqueness of a work might become a determining factor in judging estimate fair value of a work in NFT.

In this article the author offers a database recording to form a price comparison in NFT sales which will be illustrated in the following diagram:

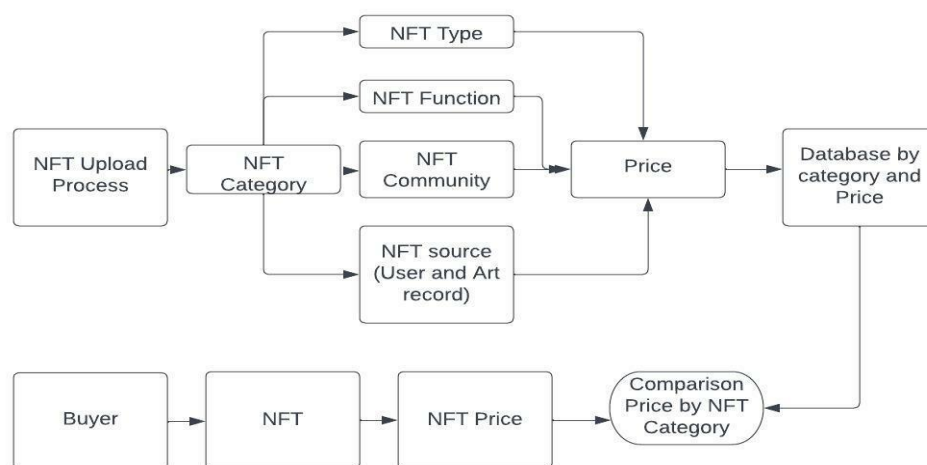


Figure 2: NFT price database recording for price comparison in NFT sales

For this reason, an appraiser will most likely need other valuation element to support the process of using the market-based approach. In evaluating works in NFT, the element of market price alone shall not be sufficient to determine a fair purchase value of a work. Other factors that might be important is utility, reputation and liquidity. Utility refers to the answer to the question on how NFT can be used and what the owner can do with it, while reputation refers to the value attached to the NFT as meant by the original creator, and liquidity refers to the answer to the question on how easy it is to acquire and sell the NFT⁵¹. A social media company called Enevti realized this issue and thus created a swappable NFT social media platform to help fans to connect with their favourite creators.

In terms of liquidity, the price of a work in NFT is evaluated by assessing on how easy will a company convert its assets into cash. Liquidity is a term used in the securities market. It allows investors to estimate the duration of time they will likely need to liquidate their shares and assets into cash. If the company is illiquid, investors will become wary, the company will face challenges in raising funds and thus may stop growing. In a nutshell, liquidity refers to the degree of which an asset or security can be

⁵¹Hugendubel (n 4).

bought or sold in the market without affecting the asset's price. NFT's liquidity is the degree of easiness where it can be purchased or sold within the network for cash in return⁵².

In most cases, NFT⁵³ trading is not made for cash, but for swaps, buyers usually exchanging tokens or token shards one another, that represent different NFTs in identical blockchain. This token exchanging transaction however, may cause problems in terms of liquidity, since there are no cash involved within. After all, liquidity of a network depends on its size, the number of transactions took place within, and the liquidity attached to that system. It means that liquidity is a significant factor in determining the price of an NFT, since the price stability of an NFT (or any assets attached therein) shall be increased as its liquidity advanced. Now, if NFT's uniqueness were only limited to embedded to just one blockchain, then there would be a limited number of transactions, which in theory would go against the increase of price and price stability.

Liquidity is a problematic aspect to adopt in producing mass NFTs in the real world as an asset for trading. For all of the reasons above, it is challenging to determine the definition of liquidity for an NFT⁵⁴, since different assets will have different liquidity depending on each user's needs. Some people may want to swap their NFTs one another, yet some may wish to take it in a liquidity pool (DeFi), while the rest may intend to exchange it for cash instead. All-in-all, easy liquidity is essential for NFT in increasing the number of broad users and to enable it to be accepted by wider community⁵⁵.

Other than liquidity, supply and demand may as well take role in maintaining price stability. Unlike stocks or bonds that requires a centralized system to enable people acquiring them, NFT is managed in a more decentralized system where two users can transfer unique crypto assets between them directly. Nonetheless, the author consider that it is not enough to generate NFT value⁵⁶. Instead of just standing in one aspect of either scarcity, utility, reputation, or liquidation, it appears that NFT value may shine brightest when the aspects are combined to extend its relevance:

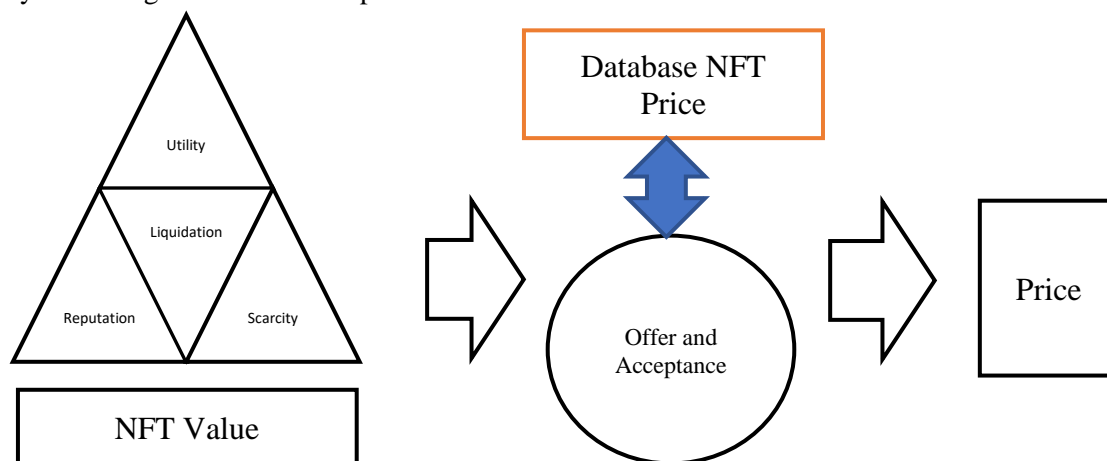


Figure 3: NFT Price using database price

As mentioned earlier in this paper, each and every elements of NFT valuation has its own down sides, and it appears that appraiser will pretty much face hurdles in using just one element within an

⁵² Bamakan and others (n 21).

⁵³ Usman W Chohan, 'Non-Fungible Tokens: Blockchains, Scarcity, and Value' [2021] SSRN Electronic Journal.

⁵⁴ Moringiello and Odinet (n 9).

⁵⁵ Steve Kaczynski, 'How NFTs Create Value' *Harvard Business Review* (2021) <<https://hbr.org/2021/11/how-nfts-create-value>>.

⁵⁶ Dolganin (n 12).

approach over another⁵⁷. It will be a whole different story if an appraiser try to fill-in the gap resulted from a certain element used in a method by using another element in the same approach in return, for instance, by combining the utility, reputation, liquidation, and scarcity elements of the NFT to produce a certain value.

The utility element may answer the very purpose of the presence of a work, be it just used as an avatar or used as a valuable collection. It may as well be used as a rare asset,⁵⁸ where the more usability it can give, then the higher its value will be. Meanwhile, a *reputation of an NFT* refers to *the journey gone through by a work right from the start until it is purchased by a buyer. The more famous the work, the higher the price will be, and the fame in this regard shall be determined by the combination of assessment from the owner of the work, the value of previous transactions, and reviews from the previous buyers and influencer.* For instance, a work will gain higher *reputation when a community consider that this work is attractive*, communication containing information about this work will travel among the community members through social media such as Twitter, Youtube and Instagram. Some might take photographs,⁵⁹ and automatically many parties will bid for this work's reputation.⁶⁰ *The liquidity of a work is related to its location, whether an NFT is created by a trusted source or not.* It is also concerning the easiness of an NFT to turn into cash and whether it is *complicated to liquidate* it or not. *This element will notably be more important if the transaction is made for business purposes, and not for owner's personal satisfaction only*⁶¹ To add the 3 elements, scarcity might close the final gap, as it defines the uniqueness of the work, it might signify NFT value by how difficult it is to find similar work in the market. Even though each NFT is unique, each NFT has different degree of scarcity. The harder it is to find similar work, then the more valuable an NFT would be.⁶²

*Although there has been no uniform approach to calculate NFT valuation, however with this scheme, it is not impossible to estimate NFT's price. Indeed, some elements such as reputation and scarcity are relatively difficult to calculate, yet the presence of other elements in this regard may as well cover the shortfall. Since NFT is unique, to estimate the value of a work in an NFT, one must conduct a specific valuation to a designated work or NFT on a case by case basis. In the end, valuation shall be useful at the gate of decision making when a purchase and sale activities occur, either to calculate the value of an asset, an artist or a work's owner. It can also help NFT owners or other parties that might be harmed or injured due to the uncertain price in NFT.*⁶³ After all, accurate decision making is a must in the NFT space. One wrong move or decision making will possibly tarnish one's reputation, it is arguably the most important currency for anyone involved in the industry. Even with all the money in the world, the best ideas, or the most profitable network connections, one wrong move may end up denylist a person from his community. Once the crash happened, it will be difficult to restore any grades he intends to show.

7. Database for Income Based Approach on NFT System

The price database in works in the NFT can also be used for calculating the income bases approach. Although in NFT it is not necessary to calculate the value of future works because what is

⁵⁷Wang and others (n 17).

⁵⁸Andrei-dragos Popescu, 'Non-Fungible Tokens (NFT) – Innovation beyond the Craze'.

⁵⁹Mojtaba and others (n 28).

⁶⁰Kaczynski (n 55).

⁶¹Schreyer and Cifichiello (n 7).

⁶²Mathieu Aubry and others, 'Machines and Masterpieces: Predicting Prices in the Art Auction Market' [2019] SSRN Electronic Journal.

⁶³Hugendubel (n 4).

needed is the price of the current NFT, there is nothing wrong if we study to think ahead that NFT in the future also needs asset valuation so that it can be used as collateral⁶⁴. Based on this, we can first map out what the function of the database is in calculating asset valuation based on this income-based approach. The price database for an NFT item whose asset value will be calculated from this database will record the price since the first NFT was sold until the year this NFT is calculated, then what is the function of this database for future calculations, from this database it can be seen up and down from sales works that will affect the value of the discount rate in calculating the Income base approach.

This value can also apply vice versa, if the database shows a stable value, then a stable risk DCR value is used in the range of 0.5-0.75. Then the database can help determine the value of future NFT works. This assessment scheme can be described in the following scheme:

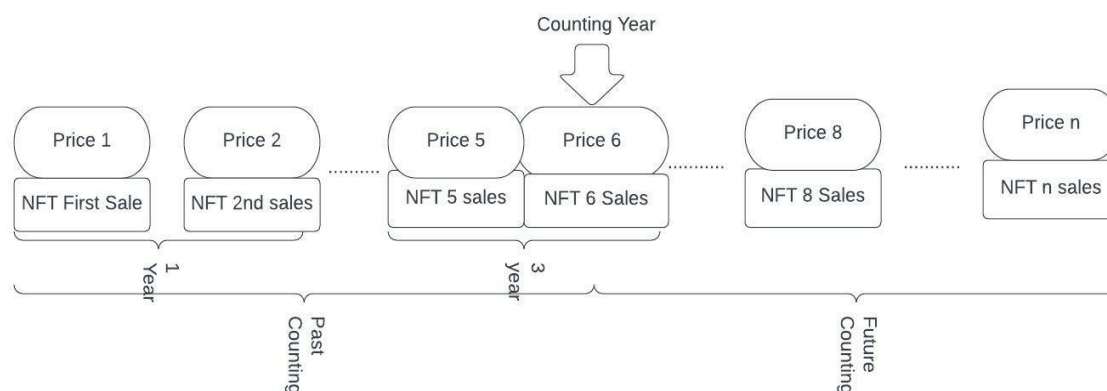


Figure 4: Database Record for Valuation Income Base Approach

if the database collected from the NFT was first sold in figure 4 at price 1, then if the calculation starts from the sixth price at the 6th sale, the cashflow starts from the first sale until the year of calculation to predict the value of income in the coming year, the price in the scheme in figure 4 is applied in the DCF formula.

$$PV = \sum_{t=1}^n \frac{CF(t)}{(1+r)^t}$$

PV = Present Value

CF = Cash Flow

r = Risk

t = Time

In calculating the formula if you see a fluctuating nft price, it means that the risk (r) becomes high, the database will affect the valuation of the NFT work and this value must be present when the nft buyer will make a purchase transaction for an nft on one of the nft websites, the buyer will not feel disadvantaged buying nft This is because the system has assessed the future value of the purchased nft. With this scheme, it is hoped that it will minimize the losses that will be suffered by NFT buyers⁶⁵.

⁶⁴ Sreenivasarao Vepachedu, 'Patent Collateral For Loan'.

⁶⁵ Moringiello and Odinet (n 9).

III. CONCLUSIONS

Every work submitted to the NFT supposedly part of intellectual property, thus, it has several methods of intellectual property protection, notably towards the digital record of the works until the very ownership can be transferred to the buyers. In NFT, intellectual property owners can monetize and get remuneration over the NFT they own through conducting transactions, this will surely come with a price. Unfortunately, prices in NFT are sometimes being erratic, unreasonable and difficult to predict, which in turn confusing both the sellers and buyers. They might as well have no idea on what is more fateful to execute, and whether they might be at loss or not. Nonetheless, being difficult does not mean impossible, the author consider that there must be a definite method to determine the price of an NFT, and this paper will hopefully able to give such recommendation.

To determine a pricing, one must start from valuating NFT works, from the existing conventional method of intellectual property valuation, the market-based approach is probably the most appropriate to use in this regard. In the market-based approach, the valuation of a work traditionally viewed from comparing value of at least 2 similar goods in the market, which in this case, 2 similar works that have been traded in NFT. Albeit it is theoretically seen as possible, it is practically not, the unique characteristic of an NFT making it quite tricky to find similar works in NFT. To fill-in the gap, an appraiser may look at other elements that affect the value of an NFT work, namely the utility, reputation, liquidation and scarcity. Indeed, the reputation and scarcity elements are still challenging to quantify in determining one's work value. However, the combination or addition of these elements in executing the market-based approach may help to ease the task of an appraiser to value a work in the NFT on caseby case basis. The value resulted may be used as a reference to determine the price of an NFT, particularly in the transaction process occurred between the seller and buyer at the time they submit requests and offers. After all, the end price shall be the number they agreed upon in the bargain process. Ultimately, NFT is a mean for creators to shake up the art industry and expand features and functionality, and it will be helpful for many existing and future industries. Thus, it is important for the relevant community to continuously develop better system for the NFT market, including the estimation to valuation and pricing mechanism. the price database can be used to determine the price by first collecting the NFT of a type and showing the comparison price the buyer will buy the work in the NFT and the price database can also calculate the value of the NFT in the future based on the income basis approach which can be used as information for the value of the buyer of the asset which will be purchased in NFT for the next few years.

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