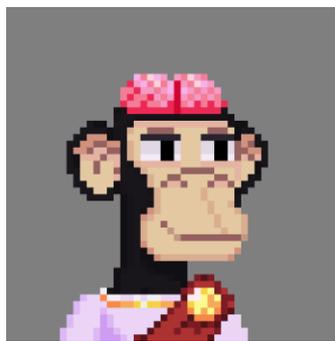


ENCODED TERRITORY

The Blockchain-based Metaverse as a Special Environment of International Law

- A doctoral dissertation research plan -



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12 April 2022

Submitted as thesis qualification for

Master's Degree Programme in Law and Information Society

[Master of International and Comparative Law (MICL)]

University of Turku

Faculty of Law

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Title image: an "Ape Gang" NFT owned by the author – a metaverse identity

Abstract

Built on private-key encryption, the blockchain metaverse presents challenges to the international order due to the limited ability of states generally to intervene in metaverse-based actions. This article-based dissertation explores questions regarding the practical limits of state power within the metaverse using a case study approach combining actual and theoretical metaverse-based actions with implications of various legal strategies employable by states to ‘tame’ the metaverse. The research is expected to demonstrate that the ability for states to claim jurisdiction, audit and enforce taxation, compel action, protect rights of people, and investigate crime is reduced in a way comparable to legal environments like that of an unfriendly foreign country, or those dealt with in the fields of maritime law and space law, leading to the conclusion that the metaverse influences the balance of global power and constitutes a sui generis environment from the perspective of international law.

Headline

The working title of the article-based dissertation project is **Encoded Territory: The Blockchain-based Metaverse as a Special Environment of International Law** and will be supervised by Dr. Outi Korhonen, Professor of Laws with the Faculty of Law of the University of Turku whose ongoing research into the deeply intertwined subjects including cryptocurrency and Decentralized Autonomous Organizations (DAOs) compliment the aims of this project.

This project is proposed as a continuation of the applicant’s work related to his recent MA in International and Comparative Law (Master's Degree Program in Law and Information Society, University of Turku) over the past two years, as well as previous research efforts taken on privately over nearly a decade in part through the authorship of two books relating to the topic titled *Blockland: 21 Stories of Bitcoin, Blockchain, and Cryptocurrency* (494pp, 2021) and *Encyclopedia of Physical Bitcoins and Cryptocurrencies* (270pp, 2016).

As background knowledge and a significant portion of initial research is already spoken for, it is estimated that the first academic article will be ready for publication at the end of the first semester of studies. While a pace of one additional article per year would ensure completion of the project within the standard 4-year period, the applicant at this stage considers it feasible to complete the project in as little as two years, without closing out the possibility of taking somewhat longer.

Background of the research

With international law largely derived from principles of territoriality relating to the belonging to, ownership, and control of defined physical space, the blockchain-based metaverse as a decentralized, non-physical virtual space which is in no practicable way operated or governed from any particular jurisdiction, poses a great challenge to the field of international law.

The term metaverse is a broad and ill-defined and is originally derived from Neal Stephenson's 1992 science fiction novel Snow Crash, in which a people spend much of their time in an interactive video-game-like virtual world. Though the term recently came to wide international attention due to Facebook's parent company rebranding as Meta, the concept of the metaverse is wide and can be thought to include any digital platform on which people can interact, including social media, games, discussion forums, etcetera, to the extent that it may be difficult, if not eventually impossible, to differentiate from the concept of the internet itself.

While the internet and digital applications of today - often referred to as Web1 and Web2 respectively - certainly continue to present many challenges to the field of international law, these challenges are in ways less fundamental than the ones explored in this project. This is because the modern internet is largely operated in such a way that individual web-domains and applications are under the control of actors such as individuals and corporations, who are able to exercise full centralized authority over the content of their websites. Because these website-controlling actors are necessarily resident in some jurisdiction, the operation, content, and dissemination of websites is governable by those

jurisdictions and by extension, international treaties and other vehicles of international law. With the blockchain-based web3 metaverse, this is not necessarily the case.

For this reason of existing practices concerning the internet, the primary definition of metaverse in this dissertation will not refer to the broad definition which may include the likes social media platforms like Twitter, Facebook, or games like Fortnite or Minecraft, but on the narrower definition which sees metaverse as based on strong encryption as made possible by blockchain technology. In this blockchain-based metaverse, smart-contracts take the role of domain names, passwords are replaced by private keys, fungible cryptocurrencies dominate payments, and non-fungible tokens (NFT's) take the form of just about anything.

Self-hosted wallets, each consisting of a cryptographic public and private key-pair, are a fundamental aspect of the metaverse as it exists today. A public key receives any quantity of blockchain tokens sent to it. All blockchain tokens received by an address remain indefinitely, unless actively sent to another address by using the private key, after which the fact of the token's previous existence in the address, along with information regarding its source and destination, will remain forever associated with the public key in question. It is notable that in recent legal parlance in the EU, such key-pairs have been described as 'un-hosted wallets', with legal reporting requirements being imposed on companies receiving transactions from such wallets. This term is in contrast to 'hosted wallets', which refers to wallets whose private keys are controlled by 3rd party entity like a company, through which a state might exercise its authority as per the established web2/web3 model.

Though regulation is beginning to happen regarding metaverse 'offramps' which see funds exit the blockchain metaverse web3 environment and enter the web1/web2 domain of which states maintain a measure of control, state's ability to govern, regulate, enforce, or track metaverse-metaverse / web3-web3 / inter-blockchain transactions (actions within the metaverse) is severely limited according to the fundamental nature of the base technology on which the metaverse is built.

While it is foreseeable that regulatory authorities in jurisdictions across the world will increasingly seek to identify the owners of self-hosted wallets for purposes of taxation and anti-money-laundering, the ability to reliably do so is and will likely remain severely limited in the anonymous/pseudonymous decentralized environment at hand.

On the other side of the same coin, the ability of states to fulfil their responsibilities of defending the rights, including human rights, employment rights, and property rights of residents who decide to operate within the metaverse is severely limited. This includes severe constraints on the possibility of successful police work to the benefit of victims of metaverse-crime.

When it comes to the metaverse, it appears states can neither effectively exercise their rights nor fulfil their obligations. As it continues to grow, the consequences of this limitation of power are vast.

Objectives

The objective of research is to describe the wide concept of the metaverse, in both some of its current forms as well as various anticipated future formats, as its characteristics pertain to international law and the varied approaches and consequences thereof. Of specific, overarching focus is the idea that the metaverse, broadly, is already and can be expected to increasingly crystallize as a *sui generis* legal environment due in large part to the *de facto* limitations of state operations within its framework. The overarching question to be answered, then, is what exactly the characteristics of this *sui generis* environment are, and how might, must, and/or should subjects of international law react and respond to this new and radical development in the field. While there is no easy answer, the practical aim of this project is to clearly lay the groundwork, and both anticipate and suggest approaches that may be employed by states and international institutions.

To answer the wider question, a number of articles will tackle smaller parts of the equation. These include mapping out problems with and identifying approaches regarding taxation within the metaverse (identifying the ability of states to make financial/reporting demands of people in the

metaverse), mapping out the limitations of state's abilities to protect the rights and interests of their people in the metaverse (identifying the ability of states to carry out their obligations to their citizens in the metaverse), and investigating the feasibility of requiring non-financial actions within the metaverse such as the destruction of NFT's or tokens deemed illegal (identifying the ability of states to command people to act in the metaverse).

Methods

This project will draw research material from two areas, namely from the legal sphere which includes relevant legislation, bills, cases, and procedure, and from the blockchain sphere, which involves the environment of the metaverse itself and its adjacent platforms.

Research material collected from these two fields will be combined both in their existing states and via theoretical extrapolation, using primarily the case study research method. These case studies will analyse legal conundrums relating to international law arising from the blockchain-based metaverse as it continues to develop and expand, while drawing reference material from existing legal cases, treaties, regulatory processes, and both passed and proposed bills at various levels of government from various jurisdictions.

The research material consists of two discrete parts:

The first is the metaverse itself and its participants, as observed by the researcher in the field. This field is difficult to define, but includes industry conferences, online platforms, and actual metaverse spaces including virtual and augmented reality and related market infrastructure including centralized and decentralized NFT and cryptocurrency exchanges. The purpose of this portion of research shall be to increase understanding of the realities of the metaverse as it exists and regarding its direction of growth, including the manner in which its participants interact with and in the blockchain metaverse and the outside world, and how those interactions are likely to evolve. This 1st-hand research especially brings great opportunities, as few legal scholars have a true, practical understanding of the

metaverse from a user perspective, and the description of such will hopefully be enlightening to many and support further research.

During this exploratory research of the metaverse, legal questions will be brought up and organized into categories relating to the legal responsibilities of users to states and each other, and of the legal responsibilities of states to users and each other within the context of the blockchain metaverse. In order to provide answers and directions for these questions, and in order to, on their basis, to draw wider conclusions relating to the status of the blockchain metaverse in international law and making predictions and recommendations regarding state's actions in response to these conclusions, relevant research of the wider international legal sphere will be conducted.

This second set of research material will be identified by reviewing a broad selection of academic literature, court cases, legislative bills, drafts, and discussions, comments by various regulators, treaties, cases, and other content. Exploratory readings will also be conducted of seemingly unrelated fields of law including maritime law and space law, with a view of identifying potential legal approaches by states to areas which are not under the control of any sovereign. This research will not focus on any specific jurisdiction, but will instead seek to identify, compare, and contrast likely approaches from various jurisdictions. With such a wide breath of research, there is an inherent risk of difficulties in separating 'the signal from the noise', and drowning in an endless amount of material, which will be counteracted by researching for very specific answers from only the best sources available in each category, without collecting endless material. Primary attention will however be given to US and EU perspectives, due to these regions playing both a leading and outsized role in the industry at the current time.

From an ethics standpoint, this project is unlikely to bring concerns regarding individual research subjects. As this project is not focused on any particular blockchain, it is unlikely that the results could be presented or in any such way that they could be foreseen to impact markets to the benefit of

the researcher or otherwise. The research material, process descriptions, and findings, while of great interest to regulators, may also be useful to criminal elements. In the judgment of the researcher, the benefits of highlighting challenges and suggesting solutions to regulators and practitioners of international law outweigh the risks of potentially informing criminals of current discrepancies and enforcement limitations. This is because unless concerns are clearly laid out and described along with suggested responses, no effective solutions can be implemented.

Timetable

The researcher's authorship of the 130,000-word *Blockland* was completed in the span of 1.5 years, and over the past 1.5 years the researcher has continually published ~2,000 word columns to Cointelegraph Magazine at a rate of 2-3 per month while both studying fulltime for his Master in International Law and engaged in various other industry pursuits, demonstrating both commitment to the subject matter and an ability to maintain a continuous and demanding pace of work.

As the researcher has already conducted MA-level studies regarding the research questions at hand, the first part of research which consists of a thorough exploration of the blockchain metaverse and identification of legal challenges related to it is already well on its way if not partially complete, meaning that the writing of publishable work for the article-based dissertation can commence immediately, with the aim of the first article being ready for peer-review or publication at the end of the first semester of doctorate studies. Under the proposed four article & introduction model, one published article per academic semester would suggest project completion within two years, which is being set as a goal. Even with a reduced output of 1 article per year, the project would comfortably meet the standard 4-year timeline.

Results

Though the project can be completed as a single dissertation, breaking it into a compilation of articles will likely better serve the aims of the research by making the compiled information and findings

more easily searchable, accessible, and more widely disseminated by decision makers and other concerned parties. From the perspective of efficient working, this format of a number of individual articles is likely to make for a faster pace of research and publication, ideally at a target rate of one article per semester.

Publication: As the subjects of blockchain, cryptocurrency, and the metaverse are popular and there are relatively few specialized researchers, the opportunities for publication are wide. The researcher's status as an established author and speaker in the industry, including as a columnist, is certainly likely to increase the probability of publication in various scientific journals including those related to tax law, human rights, and those at the intersection of technology and international law. It is further anticipated that there will be opportunities to present the papers in conferences.

Territoriality and the of Taxation of Income in the Blockchain Metaverse - Can States Exercise Their Rights?

This article will examine questions of territoriality in regards to the taxation of income of various forms and derived in various ways in the metaverse. A number of different principles of taxation will be compared and contrasted in these analysis, so as to demonstrate the difference of approaches in various jurisdictions. Questions will involve things such as the feasibility of determining the source country of income which is particularly relevant for jurisdictions with a territorial tax, as well as discussions around the difference between income tax and capital gains tax and to what extent various activities in the metaverse such as collecting rent for digital properties or farming on digital land may or may not be easily placed among these categories. For countries which practice wealth taxation, we must consider whether such wealth taxation would apply to the current value of held NFT's, and theorize whether it is practicable to accurately value NFT's for these purposes

Human Rights, Labour Rights, and Other Rights in the Blockchain Metaverse - Can States Protect the Rights of their People?

This article will examine the metaverse from the perspective of rights, specifically human rights as well as labour rights among others. Some interesting subjects to broach upon include the right to privacy, the right to property, freedom of expression, as well as rights relating to employment. For example, what is the status of someone who works fulltime in the metaverse on behalf of someone- is such a person an employee, and can they expect certain things from their employer, including knowledge of the employer's real identity? The question of privacy rights is interesting, because the blockchain world is widely transparent, meaning that the actions of individual accounts are plainly visible, even if the identities of owners are unknown, which potentially increases the importance of privacy in not allowing account ownership information to be leaked. The freedom to own property is interesting to analyse as it could be understood to justify anyone in owning both cryptocurrencies and digital assets in the metaverse. Further, it will be relevant to examine to what extent, if any, these rights can be enforced and to consider which authorities would be responsible for doing so, and whether the responsible authority (of a particular state) can reasonably be determined.

Legal Responsibilities in the Metaverse - What and on What Basis do Participants Owe States?

This article consists of an analysis of various legal responsibilities that holders of blockchain private keys may find themselves with. These may involve responsibilities, according to jurisdiction, to maintain records of controlled addresses as well as regularly checking them. This requirement of checking addresses regularly may be controversial because it a party can have thousands of addresses which they would somehow become responsible for 'maintaining'. Such regular checking could be required in order to ensure the recording of any new receipts or airdrops. Another relevant question here would concern illegal NFT's, which might contain text or images whose possession is prohibited.

Whether holding an NFT could be termed ‘possession’ under any legal system would be highly controversial, as would requirements to ‘destroy’ such NFT’s.

The Blockchain Metaverse as Sui Generis Legal Environment – How Can States Adapt to a Sphere They Cannot Control?

While the metaverse is not a sovereign nation under international law, it is interesting to consider that it can be interpreted to fulfil a number of criteria of statehood including a population, defined territory, government, de-facto independence, and a degree of permanence. Put simply, the metaverse can be imagined as a foreign land whose territory is defined by blockchain, whose affairs are governed by smart-contracts and a complex system of decentralized blockchain governance, which has a defined population of users who store significant levels of wealth and spend significant periods of time engaged with the metaverse. Perhaps most critically, this metaverse is more than just a make-believe game in that its governing bodies exercise de-facto control of the affairs of the domain in such a way that no country can predictably control or seize assets held there. From the perspective of the state, the metaverse is for this latter reason more like a foreign country where the state’s citizens may hold assets and businesses, and less like a mere platform of socialization and commerce. For this reason, it is likely that governments across the world will begin treating the metaverse as a unique legal environment, because nothing quite like it has existed before and there are few other options available.

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APPENDIX

The following appendix contains portions of research completed so far. These are mere starting points for wider research, but are meant to lay the groundwork for a deeper examination of the metaverse environment and the capabilities and limitations of existing regulations within it.

NFT's and blockchain: Introduction and Background

This summary explains the concept of an NFT as well as its historical basis and deeper connection to and status as an intrinsic part of the blockchain ecosystem. A brief history of the blockchain and relevant concepts is also offered

A case study on Axie Infinity

Axie Infinity is a play-to-earn blockchain-based metaverse game involving player characters which are NFT's, which battle each other to earn cryptocurrency. In-game metaverse NFT land is also available, and can be farmed for additional game-based cryptocurrency. The broad in-game and external network of the game's reach in the metaverse and various interactions thereof and legal questions arising are brought to light.

A case study on Bored Ape Yacht Club

Bored Ape Yacht Club is perhaps the most well-known NFT brand to date, consisting of infamous "digital monkeys" whose market values can rise into the millions. Ownership of a Bored Ape Yacht Club NFT has brought "club members" huge benefits in its first year, including additional free NFT's, NFT mint passes, large amounts of ApeCoin cryptocurrency, and cryptocurrency airdrops by third parties. The true power and influence of NFT's is revealed, along with questions relating to IP rights and Know Your Customer (KYC) regulatory requirements.

Examining the comparison of NFT minting and loot box gambling

In-game loot boxes have faced recent criticism relating to concerns regarding gambling and addiction. This logical analysis which draws from the two case studies examines various routes of argumentation to compare and contrast the differences and similarities of various methods of NFT minting with the elements of loot boxes which certain regulators consider problematic.

NFT's and blockchain: an introduction and background

“It’s often said that money corrupts art,” Joe Hage, Damien’s advisor who’s helping to launch the project, told Bloomberg. “But this is an attempt of art corrupting money.”¹

Damien Hirst is a globally renowned artist, and his recent work, titled *The Currency*, consists of 10,000 similar paintings of dots. NFT’s, unique blockchain tokens representing each work in the series, were sold to online buyers in summer 2021, with an interesting twist: buyers had one year to decide whether they wanted to keep the NFT pertaining to the work or destroy it in order to receive the physical canvas. For each NFT not destroyed by the deadline, the physical work would be shredded or burnt.

What is more real – the original physical canvas signed by the artist, or the immaterial blockchain-verified token pertaining to it? As digitization progresses, there is no easy answer.

2021 has seen the NFT become mainstream, with McDonalds releasing limited edition burger-NFT’s and celebrities like Justin Bieber, Eminem, Jimmy Fallon, and Snoop Dogg sporting NFT profile pictures worth millions. As the auction house Christies sold a single NFT for 69 million dollars, dozens of blockchain-based games have been built to operate via player-owned NFT’s.

NFT’s have exploded in popularity as their use in blockchain games, art, collectibles, and as purported titles to both tangible and intangible property and securities has opened a world of headache for not only those who deal trade in them, but also for the regulators and legal professionals who must soon

¹ Northam, Tora (July 2021). [Damien Hirst Wants You To Choose Between NFTs & Physical Art](#). *Highsnobiety*.

come out with clear and well-reasoned guidelines and best practices regarding the legal treatment of various forms of NFT. It is for this reason that I have identified NFT's, and more specifically the **investigation of the responsibilities and legal ambiguities of NFT use and ownership in a global context** as a theme worthy of further study.

In the following chapters, I will explore the development of NFT's from a functional and comparative legal perspective through the use of case studies, identifying some of the legal uncertainties and challenges rising from these ongoing innovations and in some instances making note of how these challenges may differ based on varying jurisdictional differences. As this exploration is an attempt to tackle the most basic questions related to this phenomenon and offer insight into potential legal interpretations of the phenomenon across jurisdictions, it can by no means be considered complete or conclusive. Nevertheless, it should serve as a fitting summary of the phenomenon which can be used by both regulators and professionals to better understand the legal context of these innovations and to help organize their thoughts.

It may be tempting to consider NFT's as a mere extension of property, applying tried and tested property laws to their ownership and disposition. While this line of jurisprudence will surely go far, NFT's represent a new challenge as they are fundamentally different from our old ideas of physical property – largely because by nature of being connected to the blockchain, they are each connected to a blockchain address to which anything can be sent, and from which NFT's cannot be removed without the keys belonging to the owner.

Among the legal quandaries around NFT's is the fact that they often exist in a borderless world of anonymity, where the identities of creators, buyers, owners, sellers, and even marketplace operators may be ambiguous, as can the jurisdictions from which they operate – perhaps even to the extent that

certain models of the metaverse could be plausibly described as a sovereign state(s) of its/their own. This new paradigm should be of particular interest to international lawyers, whose “discipline is both tenaciously attached to the classic definition of international law as ‘law among sovereign states’ and full of denunciations of international law's fetish-like attachment to states and to 'sovereignty’.”² Still, lawyers are likely to struggle when encountering the blockchain-based metaverse, because it is in many ways a virtual wild west in which state actors have limited ability to exercise authority. Such concepts may be especially difficult to swallow for international lawyers used to viewing states as the de-facto sources of order, as “the process of being trained in a discipline often involves coming to believe, reproduce, guard and pass on the narratives at the heart of that discipline.”³

As NFT's are a new area of focus, it is likely that professionals encountering them in the course of their work will be left scratching their heads. Similarly, individuals and businesses looking to jump onto the NFT bandwagon may find the phenomenon intimidating, particularly from the perspective of legal particularities. There are also the policy makers and analysts, for whom this paper is primarily intended, who are seeking to comprehend the dimensions of the phenomenon and may easily misunderstand the NFT revolution as something far more straightforward than it is.

The origin of NFT's

On the blockchain, anyone can receive, hold indefinitely, exchange, and send a limitless amount of value without such actions being in any way tied to their legal person by way of Know Your Customer (KYC) or other regulations which govern the existing financial industry. This value need not be denominated in ‘volatile cryptocurrency’ like Bitcoin or Ethereum, but can also take the form of NFT's such as rare video-game characters or items, digital real estate, art, physical objects (e.g. luxury

² David Kennedy, 'My Talk at the ASIL: What Is New Thinking in International Law' (2000) 94 Am Soc'y Int'l L Proc 104 (page 107)

³ Anne Orford, 'Embodying Internationalism: The Making of International Lawyers' (1998) 19 Aust YBIL 1 (page 3)

watches) whose ownership and physical delivery is guaranteed by the NFT, and ‘stablecoins’ whose value is tied to that of fiat currencies like the US dollar, or even precious metals like gold.

The blockchain age began on January 3, 2009, when the pseudonymous Satoshi Nakamoto launched the Bitcoin blockchain which he created. This system was novel, because it allowed for computers to send and receive units and sub-units of Bitcoins, or BTC, peer-to-peer in a cryptographically secure manner. This system functioned as a “distributed ledger” assigning amounts of BTC to individual accounts labelled as “Bitcoin wallets”- each consisting of a public key and a private key. Whereas the public key (wallet address- comparable to a bank account number) was publicly visible along with the allotted amount of BTC assigned to it at any given time as well as historically, the private key (comparable to a password or key in terms of bank account or safety deposit box, respectively) was private only could be used to remove units of BTC from the wallet by way of sending them to another wallet and thus had to be kept private by its user. This distributed ledger operated on a consensus mechanism in which, on an approximately 10-minute interval, participating computers confirmed the accounts of the ledger, known as a “confirmation”, by mutually agreeing to which transfers had taken place within the network within that timeframe. These transfers consisted of amounts of sub-units of BTC called satoshis, each of which represented 0.000,000,01 BTC, whereas the theoretical maximum units of BTC within the system was 21,000,000 BTC, or more accurately stated, 2,100,000,000,000,000 sub-units (satoshis), making the system closed and anti-inflationary beyond that point. The Bitcoin currency was fungible, meaning that each sub-unit was equivalent and indistinguishable from one another in a way comparable to units of traditional currency existing within a bank account.

Since Bitcoin’s creation, many have proposed and/or enacted innovations relating to the broad area of blockchain and cryptocurrency. One such early idea was the introduction of ‘coloured coins’ into Bitcoin, whereby individual sub-units or collections thereof could be cryptographically marked or

‘coloured’ in order to set them apart as unique and individual non-fungible tokens whilst retaining their ability to be sent and received over the protocol. This would make it possible for the protocol to function not only as a ledger tracking the amount of BTC held by various addresses, but also as a ledger tracking individual, unique, indelible, and specially labelled tokens or ‘pegs’ which could be used to represent all manner of things outside of the protocol. In practice, this could allow for a company to issue shares on the Bitcoin blockchain by, for example, ‘colouring’ 1,000,000 sub-units and labelling them as representative of 1,000,000 corporate shares. A single sub-unit could similarly, in theory, be used as a peg to represent the legal title of ownership of a designated property, such as land, real estate, trademark, or vehicle.⁴

The advent of the Ethereum Virtual Machine, connected to the Ethereum cryptocurrency launched in 2013, made this type of specialized use of blockchain possible by way of its ERC-20 standard which enabled the creation and issuance of fungible Ethereum-based tokens. When issuing a new token, creators could designate the total sum of tokens created as well as a token name and ticker. As these tokens functioned on Ethereum, they could be seamlessly transacted via Ethereum wallets and smart contracts which could hold any number of different tokens. This interoperability made it convenient for cryptocurrency exchanges, which previously had to maintain dedicated software and infrastructure for each cryptocurrency such as Bitcoin, Litecoin, and Ethereum, to begin transacting in and listing hundreds of different cryptocurrencies as they were issued. In 2017, this ability to issue new tokens which could be traded on centralized cryptocurrency exchanges led to a period known as the ‘ICO bubble’, during which companies raised capital via Initial Coin Offerings, or ICO’s. In these ICO’s, investors bought coins or tokens (both terms are largely interchangeable) issued by a company in hopes that these tokens would have use cases that bring demand and thereby increasing values.

⁴ [Colored Coins](#). *Bitcoin Wiki*.

This process was comparable to the way traditional investors buy corporate stock in an initial public offering, even though these tokens did not usually represent actual company shares.

While the ICO boom tempted investors, the ERC-721 was created in 2018 to facilitate the creation of individually identifiable non-fungible tokens, or NFT's.⁵ Unlike ERC-20 tokens or other cryptocurrencies, these non-fungible tokens were indivisible and non-interchangeable with others, whether they belonged to a larger set of similar tokens or not.

The first applications of non-fungible tokens were in experimental games. One of these was called Cryptokitties, in which players could “breed” NFT's representative of “virtual cats”, with the resulting offspring randomly inheriting “genetic attributes” which were encoded into the parents.⁶ This process could be repeated over many generations of NFT cats, producing various combinations of characteristics which were apparent from the computer-generated images of the cats bearing differential features. As each cat was a transferable token on the Ethereum protocol, marketplaces quickly sprang up where cats could be bid on and sold. As the system was entirely transparent, perspective buyers could select to bid on cats with specific “rare” characteristics, in hopes of breeding increasingly rare, and thus more desirable and valuable, digital cats. In its early days, this game was so popular that the repeated breeding of cats caused a notable rise in the Ethereum network's transaction volume leading to temporary instability.

Two other notable early NFT's include Ether Rocks and Cryptopunks. Ether Rocks, created in 2017, was a collection of 100 identical pictures of a rock drawn in comic-book style, each differentiated by

⁵ [ERC-721 Non-Fungible Token Standard](#). *Ethereum.org*.

⁶ Serada, Alesja, et al. “CryptoKitties and the New Ludic Economy: How Blockchain Introduces Value, Ownership, and Scarcity in Digital Gaming.” *Games and Culture*, vol. 16, no. 4, June 2021, pp. 457–480, doi:10.1177/1555412019898305.

the use of a slightly different hue of colour upon the rock.⁷ The latter Cryptopunks, “minted” in June 2017, consisted of a collection of 10,000 unique computer-generated 8-bit ‘punk faces’ with various differentiating characteristics including hair, skin, and accessories like glasses, hats, and jewellery. In 2021, the “floor price” of Ether Rocks surpassed \$1,000,000, and a single rare “monkey” Cryptopunk sold for over \$10,000,000 in December 2021.⁸

⁷ <https://etherrock.com/>

⁸ <https://www.larvalabs.com/cryptopunks>

A case study on Axie Infinity

Axie Infinity is a blockchain-native game, meaning that its gameplay is governed largely by smart contracts operating on the Ronin chain, which is a sidechain of Ethereum. The game is developed by Sky Mavis, a company based in Vietnam. In the game, players use teams of cartoon-style game-pieces called Axies, each of which has a unique mix of ability statistics and “genetic” attributes to “battle” with comparable teams controlled by other players in hopes of levelling up their Axies and earning in-game potions called “Small Love Potion” (SLP). When not battling, players can use their Axies to complete other tasks in Lunacia, the game world in which Axie Infinity exists. This world consists of a map made up of 90,601 land plots on which players can farm another in-game currency called AXS. These land plots can also be customized via in-game items purchased with in-game currency. The in-game “Ronin wallet” allows players to store their SLP and AXS, which, when enough of both are gathered, can be combined and “burned” (destroyed) by players to “breed” two of their Axies, each of which can be bred up to seven times over their existence, in order to produce an additional game piece, thus increasing the competitiveness of their gameplay and thus their ability to earn further SLP and AXS.

So far, so good – sounds like a normal closed-system video game without much legal uncertainty. If only it were so simple!

Each Axie is an NFT that can be sold on an open market, and whose prices fluctuate in part according to speculation and according to the rarity and desirability of the Axie’s attributes as well as the number of their remaining “breeding credits”. The SLP, which Axies earn by playing the game, is an inflationary cryptocurrency without a supply cap, also fluctuating in value according to demand. The land plots within Lunacia, which are used among other things to “farm” AXS, are also NFT’s- virtual

land owned by players who buy and sell individual land plots on the open market. AXS is a deflationary supply-capped cryptocurrency, also trading on the open market, which holds voting rights to the future development of the game and was split originally between game developers, investors, and a portion allocated to in-game “farmers”, among others. The Ronin chain, developed for the game, also has its own Ronin cryptocurrency, or RON.

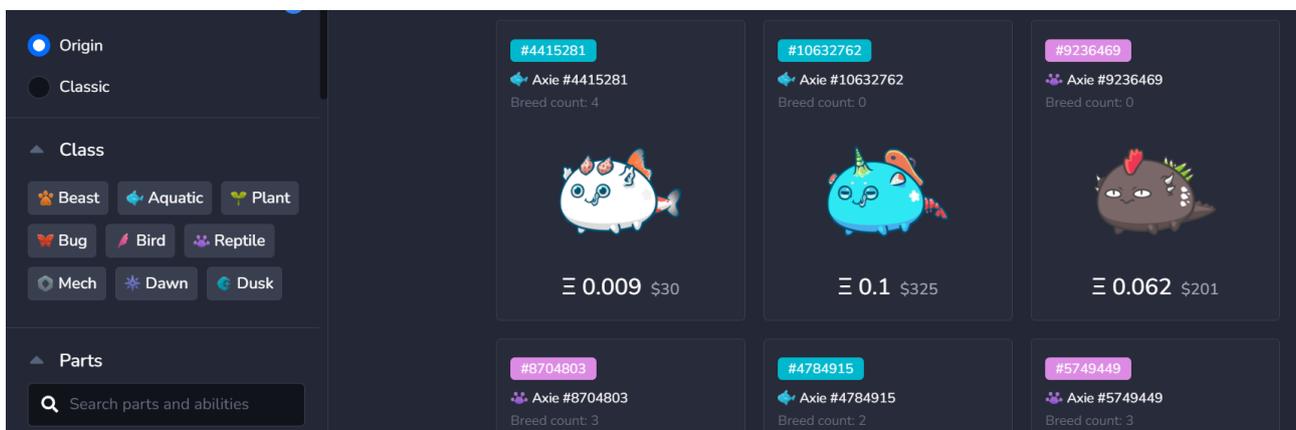


Figure 1 Axies for sale for ETH on the in-game marketplace. Screenshot by Elias Ahonen April 10 2022.

Axie Infinity is often described as a play-to-earn game, meaning that players earn “money” by fact of playing. Playing on a fulltime basis, a player with a team of three Axie game pieces is reliably able to earn an amount of SLP each day which, according to market fluctuations, has often amounted to well above minimum wage in certain countries.⁹ It is an example of a metaverse - a virtual world whose influence ripples into and mixes with reality.

At first glance, a few legal questions arise.

⁹ [This NFT game is helping Filipinos earn above minimum wage.](#) Create Phillipines.

- 1a. What are the tax obligations of players who, as a direct result of their in-game actions gain liquid cryptocurrency, for which a monetary value can be calculated? Do these obligations differ whether they simply use the currencies in the game, or exchange or withdraw them?
- 1b. What are the tax obligations of players who, as an indirect result of their in-game actions gain liquid cryptocurrency, for which a monetary value can be calculated? Do these obligations differ whether they simply use the currencies in the game, or exchange or withdraw them?
- 1c. What are the tax obligations of players who, as an indirect result of their in-game actions gain NFT's for which a minimal market value can be determined? Do these obligations differ whether they hold or use these NFT, trade them for other NFT's, or trade them for cryptocurrency?
- 1d. Since the breeding of Axies involves probability and randomness with the potential of creating an especially rare and valuable Axie, can it be classified as gambling in a way comparable to how in-game loot boxes have fallen under gambling legislation in the EU and elsewhere?
- 1e. What rights do players have over the Axies which they control?
- 1f. To what extent is it feasible to value individual NFT's such as Axies or land plots, as may be necessary especially in cases of divorce, wealth tax, or inheritance.
- 1g. As in-game land plots produce AXS, can they be considered as income-producing assets or even securities? Would this income be considered normal (a result of "farming" work), or a capital gain?
- 1h. As AXS tokens provide holders with voting powers, can they be considered securities?

But wait, there's more!

Since putting together a capable team of Axies can cost about \$1,000, smart contract-based solutions have been created to allow for less financially capable players to “borrow” teams of Axies while ultimate transferability and thus ownership remains with the lender. This has created a situation where some players become employees (in the broad and general of the word), promising to play the game on a fulltime basis in return for a share of the SLP tokens generated through their gameplay. As a result, the Axie-providing “manager” earns a daily profit from the labour of their “scholar” (worker) who labours using NFT’s that amount to the manager’s equipment. In some places in the global south, namely the Philippines, the earnings of these full-time Axie Infinity players have surpassed minimum wage making the number of players looking for “work” greater than the number of “managers”, leading to significant competition as observed by known “managers” receiving at times dozens of unsolicited “applications” publicly via Twitter from users whose post history demonstrates weeks of unsuccessful application activity.

- 2a. What are the legal responsibilities of an individual who hires someone to play a game for them in exchange for part of the earnings? Does the player become an employee, a self-employed contractor, or something else?
- 2b. To what extent can the SLP earned by the player and the owner be considered income, and how can it be calculated considering the fluctuations in SLP value?

It only gets more complex from here.

In some cases, individuals owning many Axies act as “managers” to a few “scholars” (workers/employees, in practice) for whose use they have provided a “scholarship” (an Axie team which makes gameplay possible). In the case of investors or speculators owning a larger number of Axies, they may hire an external salaried (or performance-incentivized) “manager” to manage their

Axies, which they then delegate to a large number of “scholar” labourers whose gameplay and resulting SLP earnings they monitor. This results in unofficial organizations with hundreds of effectively full-time employees in an entirely unregulated global environment.

- 3a. Are large-scale Axie-owners who hire many players operating small businesses which they need to register or incorporate in their own countries of residence?
- 3b. Is it legally problematic if they do not know the identities of the players?
- 3c. Is it legally problematic if the players do not know the identities of their employers? This may be particularly relevant in countries with territorial taxation, such as the Philippines where a large portion of players reside, because they would theoretically owe tax on Philippines-derived income only.

In the name of efficiency, some owners of Axies have pooled their Axies into a single pool, managed by one or more “managers” who can oversee hundreds of fulltime “scholars” who are given the use of Axies with which to earn SLP for these collectives which resemble companies with owners (Axie owners), assets (Axies), managers, and employees (players, known as scholars). Often the owners, and even all participants in the hierarchy, are anonymous and operate without names. One way in which they have organized in this pseudonymous environment has been by forming Decentralized Autonomous Organizations, or DAO’s, to manage their interests. A prominent example of such a DAO is Yield Guild Games, or YGG. The purpose of YGG is to “bring players together to earn via blockchain-based economies.”¹⁰ YGG has its own YGG-token, which allows holders to vote on matters pertaining to the DAO and constitutes an ownership stake in the DAO’s assets, giving it the practical function of a share in the DAO- which is not registered as a business, does not pay taxes, has no employees or directors, and no clear jurisdictional base, yet still manages millions of dollars

¹⁰ <https://yieldguild.io/>

in assets and over 10,000 “Axie players” “across Southeast Asia, India, Latin America, Brazil and Europe”¹¹ whose daily production adds to the organization’s coffers with the expected effect of increasing the value of YGG tokens.

Another way in which the game can be “played” is by “staking” AXS, which refers to a process in which AXS is locked and accrues additional AXS in a process that can be compared with the traditional concept of interest, with certain contrasts.

- 4a. If previously earned AXS is staked within the game, would the AXS “interest” earned from staking be calculated differently, as a capital gain?

As SLP, AXS, and RON are also frequently exchanged together, it is possible to deposit these tokens as liquidity to “decentralized exchanges”, or DEX’s, which exist outside the game and provide exchange services via smart contracts for their largely anonymous userbase without Know Your Customer (KYC) procedures. As “liquidity providers”, “players” earn a percentage of exchange fees paid to the platform, often amounting to significant double-digit annual growth in the quantity of their invested tokens. Under some functional models, these liquidity providers may receive a DEX-issued NFT which serves as a digital bearer instrument whose owner is allowed to withdraw the deposited amount of liquidity from the DEX, inclusive of all fees and rewards earned since the deposit. These DEX’s also commonly have their own tokens (UNI, SUSHI, etc.) which function as voting shares for the DAO’s which govern the exchanges and tend to increase in value due to distribution mechanics influenced by the platforms’ usage.

¹¹ Yield Guild Games (January 7, 2022). [YGG: 2021 Year End Retrospective](#). *Medium*.

As Axie Infinity is not a closed system where tokens exist only in the game, there are also liquidity pools and exchange pairs between the Axie-related tokens and the likes of Ethereum (ETH) and stable coins tied to fiat currencies (USDT, USDC, BUSD, etc.), among others. This allows players of all categories to move assets between Lunacia and the extended Web3 environment, from where they can also be converted to fiat money in their bank accounts.

What in the world is going on? For readers with even a passing familiarity with the legal systems and principles that underpin western societies, the sheer headache and quagmire emanating from this scenario should be palpable. This is the nature of the nascent NFT phenomenon which has sprouted from the blockchain revolution. Upon brief consideration of the facts presented above, it appears that the hands of legislation are tied- in part because blockchain applications developed and used by anonymous actors float in an ethereal cloud without clear legal jurisdiction, in part because enforcement of existing law around incorporation, taxation, IP, and employment is highly impractical in the permissionless Web3 environment, and partly because the implementation of wide-reaching regulation would come with all manner of apparent absurdities like defining every player of a videogame as an economic actor with the obligation to keep detailed tax records of their gaming hobby.

Even in this very limited and incomplete example of the Axie Infinity ecosystem, we have encountered a complex system of internal and external elements of the game, all of which interact with each other. In almost every sense they appear as the virtual, blockchain-age recreations of age-old concepts around which law has been formed and for which wars have been fought for millennia. These include labourers, their professional managers, the owners of productive land and industrial equipment, money changers, investors of all kinds, as well as governance structures where share

owners vote according to the shares they control. In the Axie Infinity ecosystem, these legally notable actors and mechanics include, but are not limited to:

- Axies – NFT game pieces which can be used to produce SLP
- Virtual land NFT's which can be used to produce AXS
- NFT game items which are used to customize virtual land
- SLP – A fungible cryptocurrency produced and earned via gameplay
- AXS – A capped fungible cryptocurrency functioning akin to a share of the Axie Infinity game
- Yield Guild Games – A Decentralized Autonomous Organization owning many Axie NFT's, land NFT's, AXS, and managing hundreds of full-time players
- YGG – A capped cryptocurrency functioning like a share of the Yield Guild Games DAO
- Over 8 million¹² players
- Players for whom playing is their primary activity source of income
- Professional managers to effectively hold jobs overseeing fulltime in-game workers
- Axie NFT and Land NFT owners who derive indirect income from their NFT's via workers
- Decentralized Exchanges (DEX's) which allow the anonymous and unlimited trading of game tokens between each other and into other cryptocurrencies and fiat-equivalents without KYC procedures
- Liquidity providers who earn income by providing liquidity to Decentralized Exchanges
- Liquidity-token NFT's, which function as bearer certificates to the investment of capital in a DEX

¹² Maishera, Hassan (4 December 2021). [This Trend in Axie Infinity Raises 'Sustainability Concerns' Despite Strong Growth](#). *Yahoo Finance*.

- External NFT trading platforms, which can be either smart-contract based or human-managed

Just as in “real life”, legal actors in Axie Infinity do not typically hold only one role- they may begin playing for fun, eventually collecting enough Axies to hire a scholar and later to purchase a plot of land from which they farm AXS, upon which they earn interest through a staking pool. They may separately hold YGG tokens and earn additional SLP income from managing the scholars of other players. What began as a hobby may unexpectedly grow to a game account whose in-game assets could be converted to millions of dollars in fiat.

It is important to understand that this case of Axie Infinity is not a one-off oddity, but that Axie is simply among the most widely played of hundreds of up-and-coming blockchain-based play-to-earn games operating on a roughly comparable paradigm. Players, workers, investors, collectors, and speculators are pouring in with little differentiation from every corner of the world, going as far as building their career prospects and identities around these games which exist outside physical space. Further it must be noted that gaming and the play-to-earn model, despite its growing size, is only a minor area of the far-reaching NFT phenomenon and is only used to demonstrate the interoperating and intertwined complexity found across the Web3 ecosystem. Indeed, the identities and assets of Lunacia can easily spill over to other metaverses, and vice versa, such as when 6-figure axis are used as verified NFT profile pictures on Twitter or an Axie manager uses a 10-million-dollar monkey NFT as a powerful marker of identity within the Axie Infinity game.

A case study on Bored Ape Yacht Club

The Bored Ape Yacht Club case study presents an interesting perspective on the Metaverse that differs significantly from Axie Infinity. In particular, it is notable that while Axie is a game which when played generates valuable cryptocurrencies to the player, holders of original Bored Ape Yacht Club NFT's have acquired a large number of assets in the form of cryptocurrencies and NFT's simply by owning them, with the active claiming of free distributions being the maximum effort required of BAYC NFT owners.

Bored Ape Yacht Club, commonly known as BAYC, bills itself as a club whose membership is tied to the ownership of one of 10,000 NFT's which function as club membership cards. The club launched on April 23, 2021, at which point prospective members were invited to join by way of paying an approximately \$200 membership fee into a smart contract which resulted in the unveiling/generation of a uniquely numbered membership token NFT, each represented by a picture of a cartoon monkey with unique features including background and fur color, clothing, expressions, and accessories. This process of unlocking a new NFT as a result of an interaction with a smart contract is known as NFT minting.

Once the NFT's came into existence on the Ethereum blockchain, there emerged a secondary market for Bored Ape Yacht Club memberships operating on pre-existing third-party sites including Opensea. On these marketplaces, holders of the BAYC NFT's could list them for sale either in an auction or fixed-price format, with prices denominated in the ETH, DAI, or USDC cryptocurrency according to the selection of the seller. Opensea and similar platforms, like LooksRare, operate on the basis of smart contracts meaning that the execution of transactions is automatic. As such, the listing process of NFT's consists of the automatic creation of a smart contract. In a typical example, an NFT is inserted into the smart contract, which is programmed so that whoever first sends a

designated amount of a designated cryptocurrency into the contract, will automatically trigger the execution of the contract which directs the NFT into the address where funds came from (the buyer), while directing the cryptocurrency received, less fees, to the address where the NFT was placed into the contract (the seller). The fees consist of blockchain network fees, also called gas fees, as well as pre-programmed percentages which include a royalty to the original creator of the NFT as well as the marketplace whose smart contract is being used. In the case of Bored Ape Yacht Club and Opensea, pre-programmed fees were set at 2.5% of sale price to the creator, Yuga Labs, and a further 2.5% to Opensea.

As word of the Bored Ape Yacht Club grew, demand for membership caused the price of NFT's to grow from a few hundred dollars into the thousands, tens of thousands, to several hundred thousand dollars, almost entirely denominated in Ethereum.

In June 2021, the Bored Ape Yacht Club executed an airdrop of NFT's to all existing members, with each NFT membership having one week to claim a corresponding NFT represented by an image of a unique cartoon dog potentially featuring characteristics derived from or similar to those of the original monkey NFT's. As the 'adoption' of a dog required action within a specific timeframe, it was not a classic airdrop but rather can be described as a distribution. This new collection of dog-NFT's came to be called Bored Ape Kennel Club, or BAKC. Over the following months, the price of BAKC NFT's rose into the tens of thousands.¹³

In August 2021, a second NFT airdrop was executed, this time with each original Bored Ape Yacht Club NFT receiving one NFT mint-passe, themselves NFT's that were visually and functionally identical from others, but divided into three types with each type differing from others. An Ethereum address holding 1 BAYC NFT would receive one mint passes, while an address containing 10 BAYC NFT's would receive 10 mint passes. The categories of mint passes received; type 1, type 2, and type

¹³ (July 29, 2021). [Spotlight: One Month After BAYC's Bored Ape Kennel Club Airdrop](#). *NFT Evening*.

3, were randomised according to their respectively increasing rarity. In addition to the airdrop of 10,000 mint passes, 10,000 more were offered to the public at a price of \$10,000 each, all of which were sold, raising the company nearly 100 million dollars.¹⁴

A mint pass is an NFT that acts as a ticket or coupon for the future minting of an NFT which can be done at a later date, and is thus different from the normal minting process which is triggered by the sending of cryptocurrency into a minting smart contract as opposed to being triggered by the redemption of the mint-pass, which also takes the form of a blockchain transaction. Under the normal minting process, such as that of the original BAYC NFT's in April 2021, the minting period ends when the amount of minted NFT's reaches the pre-programmed threshold, if such a threshold is set. Because NFT mint passes act as a coupon or key with which to mint or 'unlock' the NFT, no deadlines are necessarily present, though they can be pre-programmed at will by the creator of the smart contract, before the contract is launched.

These mint passes were referred to as 'mint vials', and represented visually as images of a test tube (type-1), a chemistry beaker (type-2), and a barrel (type-3), each containing a green radioactive 'mutating' liquid. Immediately after distribution via the airdrop, these mint passes began to trade on third-party marketplaces, with the rarer type-2 and type-3 vials trading for significantly more. As demand increased, the value of the very rare type-3 mint passes rose into the millions of dollars.

Minting new NFT's using the 'radioactive vial' mint passes was done by executing a smart contract with the chosen mint pass and BAYC NFT, with the result being the destruction of the mint pass NFT and the generation and receipt of a new NFT. This process was described as making a BAYC NFT monkey 'drink the radioactive vial', causing a 'mutation' to occur. As such, the resulting NFT was visually represented as a 'mutated' version of the original BAYC monkey NFT, with the mutated

¹⁴ Genç, Ekin (29 August 2021). "[Bored Ape Yacht Club Sells \\$96 Million of Mutant Ape NFTs in One Hour](#)". *Decrypt*.

version clearly being based on the original, but with features presented in a different style. This new collection of NFT's, limited to 20,000, came to be called Mutant Ape Yacht Club, or MAYC.



Figure 2: Two Bored Ape Yacht Club NFT's (left) with the derivative Mutant Ape Yacht Club NFT's (middle and right). Source: "The Bored Ape Yacht Club (BAYC) NFT Collection: Everything You Need to Know," Cryptopotato.com, 2022.

As each Bored Ape Yacht Club NFT received the opportunity to mint a 'mutant apes', many members of the club decided to sell their newly minted MAYC NFT's on the open market, with dollar prices rising from thousands into the six figures, predominantly denominated in Ethereum.

It is notable that while each NFT in the BAYC, MAYC, and BAKC collections was equal in the sense that each signified an equivalent membership into the 'club' in question, their only differentiator being the unique the visual image created by the randomized attributes, sales prices demonstrated market behaviour which valued certain aesthetic characteristics over others. As such, markets did not rise linearly. Rare traits including 'gold fur', 'DMT fur', 'trippy fur', 'laser eyes', as well as rare accessories like crowns raised the demand of specific BAYC NFT's significantly, while other traits such as 'crazy eyes' saw less demand, leading them to be listed at lower prices. Speculators entered the game, buying NFT's with specific traits in hopes of higher sales. While BAYC NFT's state that

they designate membership in a club, it is clear that at least on the higher ¹⁵end the NFT's trade more like art.

On March 16, 2022, Yuga Labs launched Apecoin (APE), a fungible blockchain token or cryptocurrency, with a view of it having utility in a metaverse game being built by the company. The company decided to distribute a portion of these tokens to the existing Bored Ape Yacht Club community, with blockchain addresses holding BAYC and MAYC NFT's being eligible to claim 10,090 APE per BAYC NFT and 2,042 APE per MAYC NFT held, with additional bonuses for BACK holdings in those addresses. Unlike a classic airdrop in which NFT's or tokens are sent directly to the relevant blockchain addresses (wallets), a claim-based airdrop such as this required metaverse participants to actively claim the tokens by initiating a smart contract transaction. Upon claim, the tokens appeared in users' respective wallets, and could be moved to centralized and decentralized exchanges (CEX's and DEX's), where they could be exchanged for Ethereum, stable coins, or other cryptocurrencies as well as fiat. It is notable that Apecoin had no trading activity and thus no market value before being made available for claiming by NFT owners.

The Yuga Labs' Apecoin distribution has not been the only distribution of cryptocurrency to Bored Ape Yacht Club members. Two notable distributions include Botto, OpenDAO, and LooksRare, which made BOTTO, SOS, and LOOKS tokens, respectively, available for claiming under various criteria. In the case of Botto, tokens were made available to every address which held certain high-value NFT's, including both BAYC and MAYC NFT's. In the case of OpenDAO as well as LooksRare, a new third-party NFT marketplace seeking to compete with the incumbent Opensea, tokens were made available to addresses which had transacted NFT's beyond a certain quantity and

¹⁵ Matney, Lucas (16 March 2022). [Bored Apes NFT project gets official 'ApeCoin' token](#). *TechCrunch*.

value on the Opensea platform, which included a significant portion of Bored Ape Yacht Club Members.^{16 17 18}

With Yuga Labs' plans to build a metaverse, there are plans to distribute land in the metaverse to Bored Ape Yacht Club holders. These metaverse plots will consist of NFT's which, like the monkey pictures themselves, can be traded on the open market.¹⁹

Intellectual property rights are central to the Bored Ape Yacht Club, with Yuga Labs having announced that all IP rights regarding the images of individual NFT's belong to the NFT holders. Owning a Bored Ape Yacht Club NFT became a status symbol in the metaverse, with even established celebrities like Madonna and Eminem making widely publicised purchases and companies like the Miami-based ELEVEN nightclub purchasing BAYC #11. There have been many reports of BAYC and MAYC NFT's being licensed to various businesses for the purpose of branding and marketing by their owners, as well as the holders of BAYC NFT's creating brands around them.²⁰ On April 11, 2022, it was announced that leading exchange Coinbase would produce a movie trilogy featuring the images of various Bored Ape NFT's, with the likeness of BAYC NFT's being licenced for use in exchange for a one time licensing fee of \$10,000, with licensed NFT's being linked with a licensing agreement NFT which will automatically transfer to any new owners if the BAYC NFT in question is sold.²¹

Many other NFT projects have attempted to replicate the success of the Bored Ape Yacht Club, including by creating collections of NFT's that closely mimic the themes and style of the NFT's created by Yuga Labs, as well as more distant works featuring entirely different animals but adopting

¹⁶ [How to Claim OpenDAO \(SOS\) Airdrop](#). *Benzinga*.

¹⁷ [What Is The LOOKS Airdrop?.](#) *LooksRare Docs*.

¹⁸ [Airdrop](#). *Docs.Botto.com*.

¹⁹ (15 March, 2022). [Bored Ape Yacht Club \(BAYC\) Plans Metaverse Land Sale And \\$APE Coming Soon](#). *NFT Culture*.

²⁰ Li, Nicolaus (April 11, 2022). [Bored & Hungry, The First Bored Ape Yacht Club Restaurant Has Officially Opened](#). *Hypebeast*.

²¹ Choo, Lindsay (April 11, 2022). [Bored Apes are coming to the silver screen in a Coinbase-produced trilogy](#). *Protocol*.

styling with examples such as “Lazy Lions” or “Ape Kids Club”. Some collections which can be said to entirely replicate the BAYC IP were banned from Opensea²² and certain other platforms, among these being PHAYC (seemingly pronounced ‘fake’) and Phunky Ape Yacht Club (PAYC), both of which feature the exact same art as BAYC, but presented as a mirrored flip in which the monkeys appear to face the left as opposed to the right.

Yuga Labs announced a partnership with Animoca Brands, a company focused on play-to-earn blockchain games and heavily involved with Axie Infinity, in December 2021.²³ Owners of Bored Ape Yacht Club were encouraged to complete a full Know Your Customer (KYC) check to verify their identities, after which they would become eligible to use their NFT to earn money as part of Animoca Brands’ play to earn ecosystem.

Despite the significant rewards of NFT ownership, Bored Ape Yacht Club has continued to insist that it constitutes a club of real members. Owners of BAYC NFT’s are able to enter an exclusive website where they can leave writings for other members to see. Additionally, several meetups of Apes, or Bored Ape Yacht Club NFT’s, have been arranged around the world both by Yuga Labs and unofficially by members of the club, with such meetups have been seen as opportunities to network with likeminded people.²⁴

²² Robertson, Adi (December 30, 2021). [Two NFT copycats are fighting over which is the real fake Bored Ape Yacht Club](#). *The Verge*.

²³ [Bored Ape Yacht Club and Animoca Brands join forces to make blockchain NFT game](#). *Animoca Brands*.

²⁴ Reethu, Ravi (November 1, 2021). [BAYC’s First Annual Ape Fest Kicks Off With a Bang!](#). *NFT Evening*.

Examining the comparison of NFT minting and loot box gambling

The case studies presented have raised the question of the equivalence of NFT minting with that loot box phenomenon, which exist in many existing games and which have come under regulatory attention around the world due to questions of gambling as well as the general wellbeing of young people. As a response, certain countries have imposed guidelines, regulations, and laws on the video game industry to limit the perceived harm caused by the use of loot boxes. These include Korean requirements for games to disclose "information on the type, composition ratio, and acquisition probability" of various outcomes,²⁵ with similar regulations in place in China.²⁶ In the legal opinion of the Dutch Gaming Authority, any loot boxes whose contents were transferrable between players are illegal due to gambling concerns.²⁷

In the Axie Infinity case study, a question was brought up:

1d. Since the breeding of Axies involves probability and randomness with the potential of creating an especially rare and valuable Axie, can it be classified as gambling in a way comparable to how in-game loot boxes have fallen under gambling legislation in the EU and elsewhere?

To consider the extent to which NFT minting may be similar to loot boxes and gambling more generally, we begin by summarizing facts regarding Axie Infinity:

- It is a fact that the breeding of Axie NFT's invariably involves a probability of chance in regard to the features present in the new Axie NFT.

²⁵ ["환호와 침묵의 쌍곡선, 확률형 아이템 이슈는 어떻게 흘러왔나"](#) (in Korean). April 9, 2015

²⁶ Fong, Henry (May 8, 2019). "Loot Box Design 2.0 – Complying with China's New Rules". [Gamasutra](#).

²⁷ ["Study into loot boxes: A treasure or a burden?"](#) (PDF). Dutch Gaming Authority. April 10, 2018. Archived from [the original](#) (PDF) on April 20, 2018.

- The creation of each Axie NFT requires the expenditure of exchangeable cryptocurrencies, meaning that real resources must be expended in order to create an Axie NFT.
- It is clearly observable that the features present in a given Axie significantly impact its resale value. These features can be both stat-based which materially impact gameplay and may increase a player's earning potential, or cosmetic, in which case they impact the resale value due to external demand based on their perceived rarity or desirability.

As the loot box concept is not definitively defined on any global level, the definition of the loot box phenomenon as found on Wikipedia is presented below:

In video games, a loot box (also called a loot/prize crate) is a consumable virtual item which can be redeemed to receive a randomised selection of further virtual items, or loot, ranging from simple customization options for a player's avatar or character, to game-changing equipment such as weapons and armor. A loot box is typically a form of monetisation, with players either buying the boxes directly or receiving the boxes during play and later buying "keys" with which to redeem them.²⁸

There are many ways by which to argue that neither the minting of Axie NFT's specifically nor the minting of NFT's generally can be said to constitute an equivalent to the loot box phenomenon. In the same vein, there exist many ways by which to argue that the same can neither be reliably termed as gambling. Some of these arguments and potential responses to them will be explored below.

²⁸ [Loot Boxes](#). Wikipedia

1. Loot boxes are generally described and imagined as individual in-game items with which a player interacts with.
 - a. The minting process of an Axie NFT does not require any specific ‘item’ which one can be said to interact with in order to create an NFT. Instead, a player needs SLP and AXS, both created within the game, which can be thought to “transform” into an Axie NFT.
 - b. In the case of ‘traditional’ minting of NFT’s, such as the initial minting of Bored Ape Yacht Club NFT’s, the only ‘item’ which one needed in order to mint the NFT was a set amount of Ethereum, with the equivalent being true in ‘traditional’ NFT minting on other blockchains as well.
 - c. Minting via a ‘mint pass’, as demonstrated by the creation of the Mutant Ape Yacht Club NFT’s, is relatively closer to matching the idea of loot box functions than either the minting of Axie NFT’s via the combination of in-game native tokens or the traditional minting process. This is because the NFT mint pass can be thought of as a digital item which when ‘opened’, reveals a previously un-knowable or even automatically generated NFT.
2. Loot boxes, or keys to them, are described as a way for game creators to earn money. The idea that loot boxes should be purchased with “real money” in order to be problematic is evidenced by a UK Department for Digital, Culture, Media and Sport’s report which stated that "we consider loot boxes that can be bought with real-world money and do not reveal their contents in advance to be games of chance"²⁹
 - a. While it is correct that mint passes in the case of Mutant Ape Yacht Club were freely airdropped to existing NFT holders, Yuga Labs hosted a public sale in which the

²⁹ [Immersive and addictive technologies: Fifteenth Report of Session 2017-19 \(PDF\) \(Report\)](#). [Department for Digital, Culture, Media and Sport](#). September 9, 2019. pp. 27–34.

company sold an additional 10,000 mint passes for \$10,000 each, meaning that the game company profited nearly 100 million dollars from selling mint passes. It is further notable that these passes generated additional money to the company via a 2.5% smart contract based royalty fee automatically imposed on sales of mint passes on the secondary market.

- i. The UK's Gambling Commission issued in March 2017 a position paper titled "Virtual currencies, esports and social casino gaming" stated that "where prizes are successfully restricted for use solely within the game, such in-game features would not be licensable gambling"³⁰. Since Axie NFT's for example are designed for use within the game, due to their nature as NFT's it is not possible for them to be "restricted for se solely within the game" because there is nothing stopping other game developers from allowing Axies to be used in third party games, etcetera.
- ii. It can be argued that because purchases secondary market purchases of loot boxes happened in cryptocurrency, they did not take place with "real money" as defined by the UK report.

1. The UK's Gambling Commission issued in March 2017 a position paper titled "Virtual currencies, esports and social casino gaming" which stated that "In our view, the ability to convert in-game items into cash, or to trade them (for other items of value), means they attain a real world value and become articles of money or money's worth ... a licence is required in exactly the same manner as would be expected in circumstances where somebody uses or receives casino chips as a method of payment for gambling, which can later be exchanged for

³⁰ ["Virtual currencies, eSports and social casino gaming – position paper"](#) (PDF). [Gambling Commission](#). March 2017.

cash.”³¹ This statement would seem to support the view that both neutral cryptocurrencies like ETH or stablecoins as well as native in-game cryptocurrencies would be deemed as the equivalent of gambling chips if these currencies are exchangeable into cash, which would theoretically include nearly all blockchain based tokens.

- iii. While it is correct that the mint passes “do not reveal their contents in advance”, it is debatable whether this or not mint pass owners/buyers
- b. Minting via a ‘mint pass’, as demonstrated by the creation of the Mutant Ape Yacht Club NFT’s, is relatively closer to matching the idea of loot box functions than either the minting of Axie NFT’s via the combination of in-game native tokens or the traditional minting process. This is because the NFT mint pass can be thought of as a digital item which when ‘opened’, reveals a previously un-knowable or even automatically generated NFT.
- i. It can be argued that unlike the case with loot boxes where the player does not know what they will receive from the box, those minting an NFT with the use of a mint pass already know what they are getting, that is, a single NFT from a specific collection. While it is correct that the features of individual NFT’s in the collection will be different and have different levels of desirability, it may be difficult to term this gambling especially because at the time in which NFT’s are minted, secondary markets are usually only beginning to operate and the values of the secondary market values of NFT’s with specific rates are usually not yet established in a reliable sense. For this reason, the minting of NFT’s with a mint pass, especially in the case of a new project, may be more accurately described as speculative when examined from the perspective of it

³¹ ["Virtual currencies, eSports and social casino gaming – position paper"](#) (PDF). Gambling Commission. March 2017.

being an economic action. It is also notable that not everyone who participates in NFT minting does so with a view of profit, but may do so as such minting is a mere mechanism of a game, or because they simply desire to hold an NFT related to the collection or creator owing to its artistic, community/social, future benefits, or other merits.

3. The outcomes of loot box interactions are generally described as random or not previously knowable by the player.

a. It is not straightforward to characterize the outcome of NFT minting as “random” nor “not previously known”. There are two justifications for this

i. Those minting NFT’s generally know what they will get one NFT from a specific collection by a specific creator. While they may not know the exact characteristics of the NFT, they generally do know that they will receive one of a certain maximum number of NFT’s in a collection, not unlike a buyer who purchases a limited-edition print from an artist. In the case of

ii. Certain NFT’s are not created beforehand and revealed upon minting, but instead directly influenced by the minting process. Sometimes called “generative art”, such a creation process relies on a number of pre-designed characteristics and code, which is often publicly available, to combine with the input of the minter’s own minting blockchain transaction. The data of this transaction, which is partly generated by the minter, is used as a “random input” by which the characteristics of the minted NFT are designated. Following such reasoning it can be said that NFT minters often play a direct role in the creation of their NFT

1. It can be counter-argued that the role that NFT minters play by contributing the transaction details are no different than the lottery

numbers that a gambler contributes, as the contribution of the minter is effectively random.

4. and receive previously unknown in-game items of various levels of benefit or desirability.
 - a. It is difficult to argue that NFT minters receive “unknown items”, except in the more edge case of someone who is among the first to utilize a mint pass in a scenario where the issuer of mint passes has not explained the nature of NFT’s minted by utilizing the passes.
 - i. The creators of mint passes are likely to clarify the outcomes of minting NFT’s using the mint passes, if for no other reason than to drive interest in the project and increase the sales of passes.
 - ii. Regardless whether issuers of passes inform users about the nature of new NFT’s, the NFT’s would immediately become publicly visible upon the first mint passes being used. This means that of a collection of 20,000 passes such as was the case with Mutant Ape Yacht Club, others would know relatively clearly the nature of the NFT’s being minted after 20 mints, or 0.1% of the total, meaning that such unknowability would likely not be a concern for 99.9% of self-selected users.