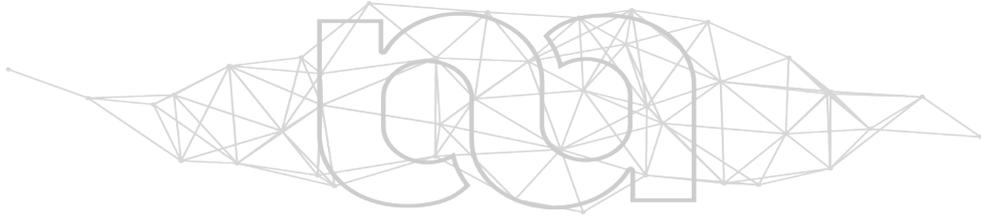
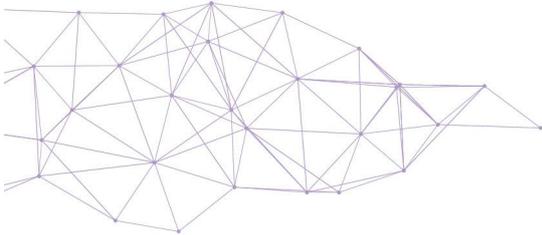


Building Digital Markets in the Metaverse: Reconsidering the Role of Intellectual Property Rights, Licensing Agreements and NFT's

**Proceedings of the International Congress Towards a Responsible
Development of the Metaverse, Alicante 13-14 June 2024**

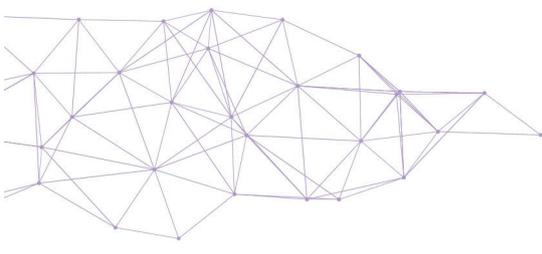
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Abstract

In this article, I argue that for the Metaverse to function and attract users, new models of digital property must be established. Intellectual Property may provide important rules, yet it cannot prevent the development of new forms of ownership. In this regard a clever combination of DLT technology (NFTs) and innovative ways of licensing may provide the basis for future commerce of digital assets in the metaverse.

Keywords: Non-fungible Token, NFT, Blockchain, Ownership, Platforms, Digital Markets, Creators, Intellectual Property, Copyright

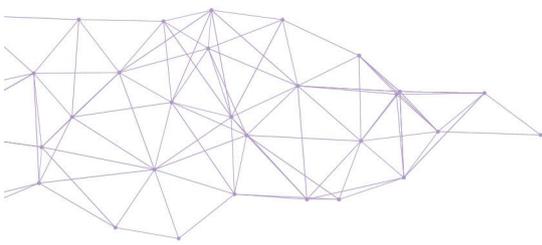
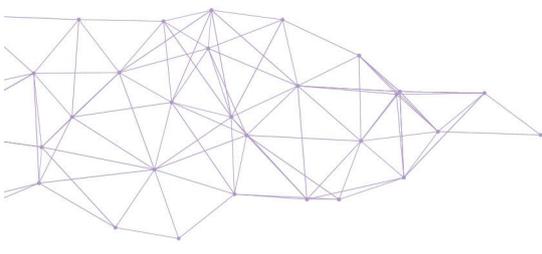


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1. Introduction

Although the process of creating the metaverse is still very much in flux, and it is difficult to predict what form it will eventually take, its final stage should resemble the analogue world as much as possible.

This means that the virtual worlds that make up the metaverse will eventually have to function as markets. The commercial dimension of virtual reality is also linked to the Web 3.0 and Creator's Economy movements, which aim to better organize the monetization schemes that operate within a traditional Web 2.0 infrastructure.

From this perspective, copyright law is likely to emerge as the main legal infrastructure regulating what users can and cannot do with assets bought and sold in virtual realms, together with platform's terms of service. The fragmentary nature of copyright law, combined with a strong scope of protection for the author, implies that all uses, both economic and ordinary (such as the display of skins or items), of the assets will have to be authorized by a license, which brings with it the risk for virtual markets of excessive authorial control, limited transactions and, in sum, a trumped-up virtual economy, key to attracting and retaining users.

Considering this risk as a tangible one, the author explores some ways to properly solve the problem of IP licenses that hamper virtual commerce. To this end, a novel method is finally proposed: the use of modular and machine-readable licensing mechanisms that allow for standardized, yet customizable, licenses.

2. The metaverse as a market: creating and distributing value

2.1. The metaverse promised land: features and needs of virtual reality

Approaching the Metaverse these days is something to be done with caution, as it has become a buzzword¹ with a multitude of meanings and conceptions behind². Trying to define the metaverse properly has become a rather difficult task³, especially since it is still impossible to predict what it will look like in the end⁴. It is generally conceived of as a shared online space combining physical world spaces, digital native spaces and the Internet to create a unified, immersive⁵, interactive⁶ and liminal⁷ environment that currently operates

¹ M. Tiberio & F. M. di Vizio, "Patents and the metaverse - The future is today", VV.AA. *Metaverse: business opportunities and legal challenges* (DLA PIPER 2022), at 6.

² As C. Peukert, .Weinhard, O. Hinz, & WMP van der Aalst, "Metaverse: how to Approach its Challenges from a BISE Perspective" (2022), *Business & Information Systems Engineering*, 64, Issue 4, 401-406, at 401, everyone is painting its own picture of the metaverse, thus leading to no consensus over a concept (at 404).

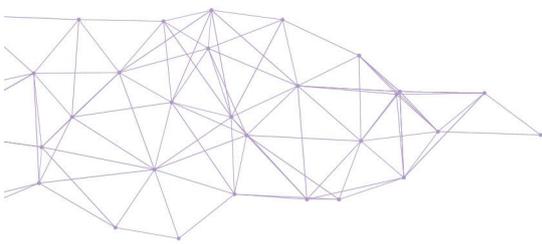
³ V. Chang, S. Strittmatter M V. Jesus L. Golightly, P Ni& K. Hall, "Exploring risks in the metaverse in an immersive digital economy", *Proceedings of the 5th International Conference on Finance, Economics, Management and IT Business* (SciTePress 2023), 107-113, at 107 et seq.

⁴ D. Friedmann,, "Digital Single Market, First Stop to the Metaverse: Counterlife of Copyright Protection Wanted", K. Mathis & A. Tor (eds), *Law and Economics of the Digital Transformation* (Springer, Germany 2022), 137-189, at 151.

⁵ M. Goldber & F. Schar "Scarcity in the Metaverse: Space, Location and the Attention Economy", *SSRN Journals*, 23, at 4, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4606813 accessed 30 may 2024.

⁶ J. Osterrieder, S. Chan y Y. Zhang & J. Chu, "Metaverse non-fungible Tokens" (2024), *SSRN Journals*, 1-29, at 2, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4733153 accessed 30 mayo 2024; D. Fierdemann (4), "Digital Single Market, First Stop to the Metaverse: Counterlife of Copyright Protection Wanted" , at 151.

⁷ R. Belk, "The digital frontier as a liminal space" (2023), *Journal of Consumer Psychology*, 34, 1, 167-173, at 167.



under a fully developed digital platform ecosystem⁸, but at its core is moving towards decentralization⁹.

Thus, there is a modicum of consensus on some of its contours¹⁰. As BALL has already stated, the metaverse is likely to deploy up to seven attributes: persistence, synchronous and live interactivity, limitless capacity of users, stable and functioning economy, convergence of physical and virtual realities, large interoperability, populated by content and experiences¹¹, and operated by an incredibly wide range of contributors, both open and closed platforms¹². We can then expect processes such as horizontal collaboration, platformization, datafication and the mutation of social relationships¹³.

Current predictions are made by analysing mainly in-built video game worlds¹⁴, as they are the closest example of a functional online environment¹⁵. However, analogies should be drawn with caution, since video game worlds are developed and structured according to a net-proprietary approach¹⁶, while the metaverse is oriented towards Web 3.0¹⁷ and makes decentralization its infrastructural key point^{18/19}.

⁸ S. Schobel & JM Leimeister, "Metaverse Platform Ecosystems" (2023), *Electronic Markets (Electron Markets)*, 33, 1-12, at 5.

⁹ V. Jimenez Serrnia, "Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios" I A. Juarez (dir) *Cuestiones Actuales del Derecho de la Moda* (Aranzadi 2023), 247-281, at 250.

¹⁰ D. Friedmann (4), "Digital Single Market, First Stop to the Metaverse: Counterlife of Copyright Protection Wanted", at. 151.

¹¹ The quality of which is key to the success of the metaverse as a whole according to S. Papagiannidis in YK Dwivedi et al "Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy" (2022), *International Journal of Information Management*, 66, 102542, 1-55, at 26

¹² M. Ball, The Metaverse: What it is, Where to Find it, and Who Will Build it (Jan 13, 2020), at <https://www.matthewball.co/all/themetaverse>; According to N. Munn and D. Weijers, "The real ethical problem with metaverses" (2023), *Frontiers in Human Dynamics*, Vol. 5, at 3, persistence, ubiquity and generality would be the novel properties distinguishing metaverse from proto-metaverse such as MMORPGs such as World of Warcraft or Second Life; see also M. Ball *The Metaverse and how it will revolutionize everything*, (Liverlight 2022), EPUB, at 17.

¹³ P. Mezei & G.C.Arora., "Copyright and Metaverse", M. Cannarsa & La Di Matteo (eds), *Research Handbook on Metaverse and the Law*, (Edward Elgar, Cheltenham, 2023) accessed through SSRN e-copy, 17 pp. p. 2.

¹⁴ Considered now to be "proto-metaverses"; Cfr. A. Lopez- Tarruella Martinez "Definiendo el Metaverso", in A. Lopez Tarruella Martinez (ed) *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (Reus, Madrid, 2023), 21-42, at 36.

¹⁵ JM GARON, "Legal Implications of a Ubiquitous Metaverse and a Web3 Future", *SSRN journals*, 1-63, at 3, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4002551 accessed 30 may 2024.

¹⁶ Thus, making the relationship between users and their assets not based on classical property but on licensing agreements, as M. McDonald, "The intersection between IP and the Metaverse: Preliminary Observations", *Queen Mary Law Research Papers*, No. 397/2023, 1-5, at 4; also see M. McDonald *The case for virtual Property*, PhD Thesis (Queen Mary University of London, 2017), at 48-49, implicitly stated.

¹⁷ A. Shibaz & A. Funk, *Freedom on the net: the global drive to control big tech* (Freedom House 2021), at 1.

¹⁸ V. Jimenez Serrania, "Web 3.0, NFTs y Propiedad Intelectual" A. Lopez Tarruella Martinez (ed) *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (Reus, Madrid, 2023) pp. 73-117, p. 76; as M. Goldberg & F. Schar "Scarcity in the Metaverse: Space, Location and the Attention Economy", *SSRN Journals*, 23, at 13, have stated, virtual worlds may become hubs of interconnected scenes in a network.

¹⁹ Decentralization not only from a spatial point of view, but also from a market power perspective, which in turn may help alleviate one of the biggest threats posed by metaverse as an immersive experience: the locking of users into particular infrastructure pressing for the continuation of the metaverse in hands of corporate entities o platforms (see N. Munn & D. Weijers (12), "The real ethical problem with metaverses", *Frontiers in Human Dynamics*, at 2).

Whether the metaverse will operate as a continuum of virtual space and reality, or as different virtual worlds (also known as realms²⁰) that can be accessed independently²¹, is yet to be determined. However, one critical aspect can already be identified today: if virtual property is not adequately established and balanced, the whole project may fail completely; the promise of the metaverse is to initiate the so-called “creators’ economy”²², meaning that the virtual space should be both, a collaborative²³ and interactive forum for expression and creativity²⁴, and a way for creators to extract value from their production^{25/26}. This ought to bring into the discussion IP legal regimes, as they will probably constitute the legal infrastructure to regulate the aforementioned “creators’ economy”²⁷.

Although not all creations will be eligible for IP protection, particularly copyright, because they will not be able to meet the creativity threshold, we need to also consider the progressive downgrading of the creativity standard that has occurred in jurisdictions such as the EU²⁸, allowing for extensive protection of minimally creative works and blurring the proper delineation between Industrial Design and Copyright regimes²⁹.

IP regimes bring new problems to the virtual world table. The ability not only to create assets and identities freely, but also to move them across different ecosystems or realms is crucial³⁰, and, furthermore, the capacity to sell, buy and resell assets will be the lifeblood of the future markets associated with the metaverse. Intellectual property

²⁰ B.J. Keegan, IP McCarthy, J. Kietzmann & Al Canhoto “On your marks, headset, go! Understanding the building blocks of metaverse realms” (2024), *Business Horizons*, 67, 107-119, at 108.

²¹ What is clear in this regard is that each world will be competing with the rest for the attention of users in an information-rich environment, thus making the metaverse an attention economy, see: M. Goldberg & F Schar “Scarcity in the Metaverse: Space, Location and the Attention Economy”, at 10.

²² WEF, *Demystifying the Consumer Metaverse* (2023), 1-52, at 19.

²³ S. Park & Y. Klm in UK Dwivedi et al (11), “Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy”, at 5, put emphasis on the collaborative aspect.

²⁴ T.T. Hsieh, RW Emerson, L/R. Foster, BA Link, C.A. Sherman & L.J. Trautman, “Intellectual Property in the era of AI, Blockchain and Web 3.0”, *SSRN Journals*, 1-50, at 36, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4392895 accessed 30 may 2024.

²⁵ As Schobell & Leimeister (8), “Metaverse Platform Ecosystems”, *Electronic Markets*, at 3, state: In a metaverse, consumers are also becoming complementors, and complementors are becoming creators. In this constellation, value is created not only by the interaction of platform owners and complementors. Value is co-created by the interactions and activities between complementors and consumers.

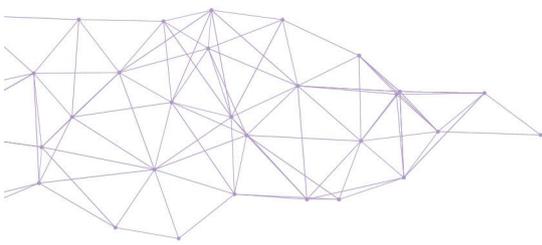
²⁶ Some creations may favor commercial exploitation better than others. For instance, B.J. Keegan et al, “On your marks, headset, go! Understanding the building blocks of metaverse realms”, *Business Horizons*, at 109 posit that the very instantiation of the self via constructing an avatar is a unique process that enables the user to expressively construct its ideal self, thus ascribing the avatar creating process in the orbit of Copyright subject matter.

²⁷ In this vein, M McDonald (16), “The Intersection between IP and the Metaverse: Preliminary observations”, at 1; although considering it from the standpoint of the weight IP currently has and has had in creative industries.

²⁸ See CJEU decision on 16 July 2009, C-5/08, Infopaq; CJEU decision on 13 November 2018, C-310/17, Levola Hengelo; and CJEU decision on 12 September 2019, C-683/17, Cofemel.

²⁹ On this topic, although in spanish, M. Cruz Ginzalez, “La naturaleza híbrida de las creaciones de forma y su protección mediante propiedad intelectual e industrial. El problema de los interfaces en el diseño industrial” (2024), *La Ley Mercantil*, Nº 111, 1-38.

³⁰ C.L. Saw & SWZ Chan, “The subsistence and enforcement of copyright and trademark rights in the metaverse” (2024), *Journal of Intellectual Property Law & Practice*, Vol. 19, issue 4, 371-384, accessed through SSRN copy, paged 1-21, at 2, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4452938 accessed 30 may 2024.



regimes can entangle the process and prevent legal interoperability from building on a first layer of technical interoperability³¹.

The freedom and participation of users in the creation and exchange of virtual and digital assets will be crucial to the success of the whole structure, since future metaverse realms will operate as platforms providing only the necessary technological infrastructure³², and users – both consumers and professionals – will be the ones creating value, thus becoming complementors of the ecosystem³³. The platform then operates as an orchestrator, responsible for providing the technical means to ensure in-world functioning and for establishing interoperability measures³⁴ to enable a seamless use of the metaverse. Orchestrators will also be responsible for ensuring the compliance with applicable regulations³⁵. To enable complementors to create, they need to be given more leeway, in the form of some kind of ownership³⁶, so that they can provide virtual markets with functionalities that are connected and combined in novel ways. The ultimate goal is to allow users to carry those creations across different platforms³⁷. This need subsists whether the metaverse is ultimately fragmented by a few powerful companies, or whether there is a crypto-based unified metaverse owned by all³⁸.

Virtual creativity will inevitably take place within the platform-based ecosystem, whether dominated by a corporation or by a Decentralized Autonomous Organization (DAO), leading to two distinct and coexisting scenarios: 1) a situation where creative activities take place endemically within the ecosystem boundaries, but without any pre-approval process controlling the creative output^{39/40}; 2) a second scenario is the act of creation taking place outside of the virtual realms and then being introduced into them⁴¹.

If we have a complex network of isolated ecosystems, the gateway to which is controlled by the platform owner, the battle for full interoperability, and with it for freedom to create and trade, will be lost, since the incentive of proprietary platform realms will be

³¹ J. Osterrieder, S. Chan, Y. Zhang & J. Chu (6), “Metaverse non-fungible Tokens”, at 2; D. Friedmann (4), “Digital Single Market, First Stop to the Metaverse: Counterlife of Copyright Protection Wanted”, at 2.

³² E. Reuveni, “On virtual Worlds: Copyright and contract Law at the Dawn of the Virtual Age” (2007), *Indiana Law Review*, Vol. 82, Issue 2, 262-308, at 272.

³³ Schobel & Leimeister (8), “Metaverse Platform Ecosystems”, *Electronic Markets*, at 3.

³⁴ However, as M. Goldberg & F. Schar (5), “Scarcity in the Metaverse: Space, Location and the Attention Economy”, at 4, state platforms are primarily concerned with their own interests and interoperability only regarding their own spaces.

³⁵ Schobel & Leimeister (8), “Metaverse Platform Ecosystems”, *Electronic Markets*, at 4.

³⁶ H. Duan et al, “Metaverse for social good: a University Campus Prototype”, *Proceedings of the 29th ACM International Conference on Multimedia*, 2021, 1-9, at 4.

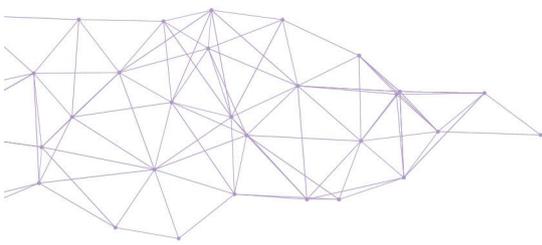
³⁷ Schobel & Leimeister (8), “Metaverse Platform Ecosystems”, *Electronic Markets*, at 5.

³⁸ JB. Nicheroson, S. Seidel, G. Yepes & N. Berente, “Design principles for coordination in the metaverse”, *Annual Academy of Management Meeting*, 1-41.

³⁹ C. Ondrejka “Escaping the Gilded Cage: User created content and building the metaverse” (2005), *New York Law School Law Review*, Vol. 49, Issue 1, 81-101, at 87.

⁴⁰ The creativity being mediated by End User License Agreements (EULAs) of the platform; cfr. D. Friedmann (4), “Digital Single Market, First Stop to the Metaverse: Counterlife of Copyright Protection Wanted”, at 153.

⁴¹ If we take a gander to what the developments are at this point, we can easily advert that this second model is currently reigning in digital asset commerce under Web 2.0 paradigm. Although we will address this topic later on, we can state that most of NFT trade right now, through marketplaces of the likes of OpenSea, Rarible, Nifty Gateway or Foundation, is taking place outside of digital realms and will, eventually, be integrated into them.



to extract rent by controlling access⁴², not only of users, but also of their avatars⁴³ and their goods⁴⁴, leveraging their gatekeeper position to shape the in-world economy as they see fit. While there is no magic solution to avoid what can only be regarded as rent-seeking practices, we can see a danger in IP rights and, in particular, in the system of licensing agreements providing legal justification for this likely behavior. With an additional grievance: IP “compliance” can be imposed on users by design⁴⁵. Furthermore, platforms, acting as orchestrators, are the ones that will eliminate any infringements by sanctioning users, as has already happened in both platform-based services and online gaming⁴⁶.

For the metaverse and its virtual realms to succeed, we must first address the situation of virtual or digital property, since it is inconceivable that consumers will see value in acquiring only the right to use their assets in order for them to be displayed in the new virtual reality⁴⁷, without any other benefit derived from ownership⁴⁸. If the aim is to create a digital world capable of replicating the characteristics of our analogue world, steps must be taken in order to make them comparable and compatible, which means allowing full interoperability between them and minimizing any possible barriers that may be erected.

The former, therefore, requires us to delve deeper into the role that IP protection will have to play as a supportive regime for the whole virtual market that is to be developed along with the metaverse⁴⁹.

⁴² Control of the entrance means also control over the exit, thus potentially making users locked-in once they start a virtual persona, when there is no easy option for transferring the meta-lives out of their initial virtual environment; see N. Munn & D. Weijers (12), “The real ethical problem with metaverses”, at 5. This train of thought potently suggests avoiding as much as possible market power concentration in the metaverse, at least on the orchestrator/platform level.

⁴³ After all, why allow users to import 3rd party avatars, when you can force them to use and pay for an in-world specific avatar for each realm?

⁴⁴ Digital goods purchased outside of the realm may be completely barred from entering or perhaps (in the best scenario) a fee may be charged for the “import” of the asset from another realm. This very same possibility is considered by M. Janssen in YK. Dwivedi et al (11), “Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy”, at 12.

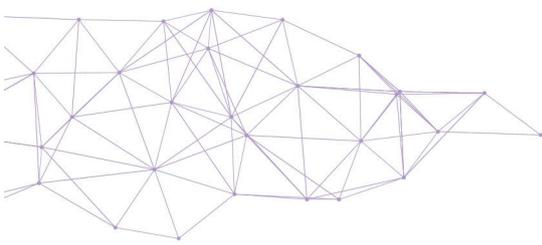
⁴⁵ As S. von der Au, P.A. Rauschnabel, R. Felix & C. Hinsch, “Context in augmented reality marketing: Does the place of use matter?” (2023), *Psychology and Marketing*, 40, 2247-2463, at 2448, stated: different immersion functionalities can be used to signal to the users what they can and cannot do in a metaverse realm, which is particularly important in mediating the interaction between users and objects within the realm.

⁴⁶ P. Mezei & G.C. Arora (13), “Copyright and Metaverse”, at 7.

⁴⁷ Although the mere tenancy of certain assets may allow for the consumer to acquire a distinct reputation and a certain degree of popularity, both on the digital and physical worlds (See M. Goldberg & F. Schar (5), “Scarcity in the Metaverse: Space, Location and the Attention Economy”, at 2-3).

⁴⁸ Along these lines S. Navas Navarro, “El suministro en línea de contenido digital. En la encrucijada entre la Propiedad Intelectual y el Derecho de Consumo” (2020-2021), *Actas de Derecho Industrial y Derecho de Autor XLI*, 133-154.

⁴⁹ As S. Dussolier “Unlimiting limitations in intellectual property”, G. Ghindi & V. Falce, *Reforming Intellectual Property*, (Edward Elgar Cheltenham, 2022), 64-77, at 66, recently pointed out IP protection should be rebuilt taking into account the notion of IP itself but as integrating the market system, and considering its role as an institution oriented towards the adequate assignment of resources, signaling the restructuring of Copyright, through a twofold framework building upon both inclusivity and exclusivity.



2.2. Intellectual Property Rights as infrastructure of virtual value creation

To the extent that the metaverse is currently being built within the Web 2.0 infrastructure⁵⁰, we can make sense of it by applying current legal regimes. This means that, for the time being, the legal framework of the metaverse will be very similar to the modern Internet: horizontal safe harbors for intermediaries (in this case mainly through Regulation 2022/2065, Digital Services Act) and Intellectual Property rights, especially copyright law.

This does not mean that all assets in the metaverse will be protected by an IP right, but it is a very likely scenario, which, in turn, raises the question of compatibility with the goals of Web 3.0⁵¹. Web 3.0 aims to develop a decentralized and democratized control of the Internet by assigning property rights to users and not to the platform oligarchies as has been the case in Web 2.0⁵², promising, as we have already seen, a real environment for artists and creators to realize the value of their production without the typical intermediaries⁵³.

In this scenario, the establishment of full-fledged property rights is still unclear. What is much clearer, however, is that some form of property will initially be established through Intellectual Property rights⁵⁴, so that the development of virtual worlds will take place in a legal environment largely defined by IP⁵⁵, especially, as case law has already shown, through copyright⁵⁶ and trademarks⁵⁷, although some prominent examples signal the use of a more unfair competition-like defense⁵⁸.

What do all these recent court decisions have in common? That they are not strictly related to the metaverse per se, but to what is bound to be the technological basis for decentralizing entitlements over digital assets: non-fungible tokens (NFTs)⁵⁹. Let us just mention NFTs for now, as we will analyse them later on.

So, the main question, once we have arrived at this scenario, is how will commerce work in the metaverse? And although the question may require some powers of divination alien to us, we can logically deduce that it will be based on IP rights, either existing or presumed to exist. This would mean that trade in the metaverse may have to rely on license agreements and technological protection measures implementing them in practice⁶⁰.

⁵⁰ J. M. Garon (15), "Legal Implications of a Ubiquitous Metaverse and a Web3 Future", at 3.

⁵¹ B. Bodo, D. Gervais & J. P. Quintais, "Blockchain and smart contracts: The missing link in copyright licensing?" (2018), *International Journal of Law and Information Technology*, 26(4), 311-336, at 336.

⁵² V. Jimenez Serrania (9), "Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios", at 251; A. Shabaz & A. Funk, *Freedom on the net: the global drive to control big tech*, (Freedom house 2021), at 1.

⁵³ P. Mezei & C.G. Arora (13), "Copyright and Metaverse", at 2.

⁵⁴ M. McDonald (16), "The Intersection between IP and the Metaverse: Preliminary observations", at 3.

⁵⁵ J. M. Garon (15), "Legal Implications of a Ubiquitous Metaverse and a Web3 Future", at 19.

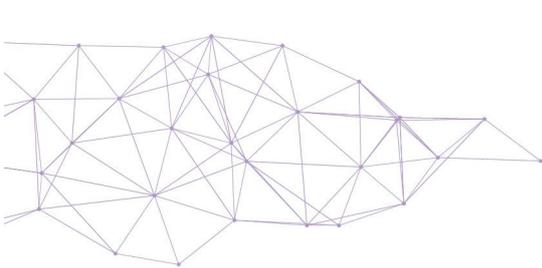
⁵⁶ See for instance *Miramax, LLC v. Quentin Tarantino et al.*, 2:21-cv-08979-FMO-JC (C.D. Cal. Mar. 10, 2022), of the Central District Court of California; or more recently in Spain Decision of the Commercial Court N^o of Barcelona, num. 11/2024, published on the 11 January 2024.

⁵⁷ See New York District Court Decision on *Hermes Int'l v. Rothschild*, 22-cv-384 (JSR) (S.D.N.Y. Feb. 2, 2023).

⁵⁸ *Yuga Labs v. Ryder Ripps, et al*, Summary Judgement 22-56199 from the Central District Court of California, now currently on appeal on the 9th Circuit.

⁵⁹ A. Lopez Tarruella Martinez (14), "Definiendo el Metaverso", at 40.

⁶⁰ M. MacDonald (16), "The intersection between IP and the Metaverse: Preliminary observations", at 1.



Let us now take a few steps back and consider what copyright law has to offer. Copyright grants its holder a bundle of rights⁶¹, divided into exploitation rights and moral rights. From an economic point of view, the exploitation or economic rights are the most relevant ones, yet the kind of use that is bound to take place in the metaverse may not be properly integrated into the already existing bundle. Generally speaking, the use of a digital asset in the metaverse may require reproduction⁶² and communication to the public rights, in order to make and keep a copy of the work and to be able to communicate it publicly, in the form of making the copy available to the rest of the users in the metaverse. Both rights will undoubtedly require a license agreement allowing the specified user to make a copy and to communicate it in the virtual space. Something that is not necessarily new, given the way Web 2.0 works today.

The transfer of ownership between participants in the metaverse is perhaps more important, since it does not generally imply *per se*, i.e. by itself, any of the economic rights generally granted to the author. However, one cannot transfer what one does not own, which means that if the right acquired through license is an EULA, which is often the case, one cannot transfer the intellectual property, nor the ownership of the digital asset itself, since one is only entitled to a right of mere use.

However, a right of use may be sufficient to create the impression of ownership in the metaverse, thus fulfilling the economic purpose of the transaction⁶³. This will require an ever-growing chain of license agreements that have their origin in the original contract signed between the original rights holder (i.e. the author or creator) and the first “owner” (i.e. the first licensee)⁶⁴.

2.3. Distribution Problems in the Digital Assets field

It is at this point where problems may arise for future virtual markets developed within the metaverse. If we are to realize the *Creator’s Economy*, we need to establish a frictionless and secure mechanism for the exchange of digital assets⁶⁵, while at the same time ensuring appropriate control on the author’s side. In terms of how to achieve this goal, it is doubtful that license agreements will provide a frictionless framework.

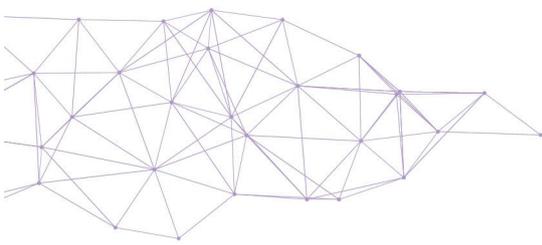
⁶¹ S. Dussolier, “Intellectual property and the bundle-of-rights metaphor”, P. Drahos, G. Ghindil & H. Ullrich (eds), *Kritika: Essays on Intellectual Property*, Volume 4, (Edward Elgar, Cheltenham, 2020) 146-178.

⁶² J. Wyczyk “The Property Law of Crypto Tokens” SSRN Journals, 2023, 1-83, at 21, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4620033 accessed 30 May 2024.

⁶³ As B BODO et al, “The rise of NFTs: these aren’t the droids you’re looking for”, EIPR, Vol. 44, issue 5, 267-282 (e-copy paged 1-35) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4000423 accessed 30 may 2024, at 5, consider that copyright where not explicitly applied, will definitely influence the practice surrounding the usage and transfer of protected digital assets.

⁶⁴ Traceability of the license agreements chain could be possible thanks to immutability of blockchain and DLT (V. Jimenez Serrania (9), “Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios”, at 252), the problem would then be as how to ensure that the license pointed by the Token each time if any is not altered. A possible solution could be to annex the license to the metadata of the token, yet high cost of DLT inscription would make such an initiative economically infeasible.

⁶⁵ As M. Janssen in Y. K. Dwiwedi et al (11), “Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy”, at 13 states, users might expect that their avatar and properties bought in one digital space can be used in another one, or, at least, should be able to recover the investment made through their resale. This is in order with what S. Navas Navarro (48), “El suministro en línea de contenido digital. En la encrucijada entre la Propiedad Intelectual y el Derecho de Consumo”, at 146-147, indicates the problems of aligning consumer expectations and rights regarding digital assets.



From our point of view, the communication to the public right, due to the inertia of Web 2.0, is the best positioned right to apply to the exchange of digital assets⁶⁶, but may become an obstacle to a fully decentralized virtual market, understood as a public or semi-public digital forum where users, both consumers and professionals, gather to trade. What we may have under a license-based ecosystem is, once again, the platformization of transactions through the rise of marketplaces, the medialization of transactions through a mix of Terms of Service (ToS) and Safe Harbor provisions⁶⁷.

To explain how this can happen, we are required to analyse the basic structure and economics of licensing agreements. License agreements work well in markets where transactions are vertically structured, i.e. where the licensor and the licensee occupy a position in different markets (vertically integrated)⁶⁸.

This means that copyright licensing works properly when transactions are vertically integrated and unidirectional in nature, always flowing towards downstream markets. This is not to say that there is no horizontal dimension to it, there may be, but what we generally end up with is a parallel downward flow of the copyrighted content, where communication areas are territorially delimited⁶⁹.

The metaverse as a virtual market⁷⁰ implies a much different framework. Considering licensing as the only means of achieving the transfer of use, encompassing both reproduction and communication to the public, the resulting structure will consist of a multipolar licensing network. Once the creator has introduced a limited number of copies of her newly created asset, the idea of decentralization would mean that any buyer (properly a licensee) should be able to resell their asset whenever she sees fit. All of these second-hand transactions may not only go against the interests of the creators but will also require the signing of a new license agreement transferring the rights of use of the first licensee to the new owner. And this is something that will require the consent of the original licensor as it will amount to a sublicense, creating a friction in the system.

This first obstacle can be easily overcome by including in the user license agreement signed between the creator and the licensee the possibility for the licensee to become a licensor himself, provided that the transfer results in the licensor losing all access and use rights relating to the asset⁷¹. A further problem arises once a number of transfers have taken place, since the due diligence on the “acquiring” party will require it to ascertain whether the potential licensor can actually and legitimately license the content,

⁶⁶ See, for instance, B. Bodo et al (63), “The rise of NFTs: these aren’t the droids you’re looking for”, at 25.

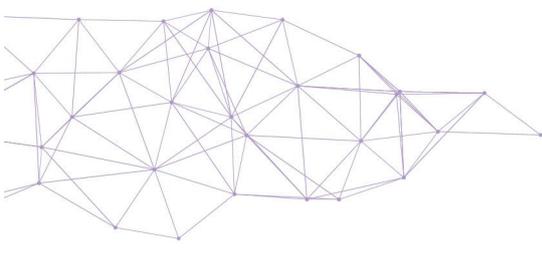
⁶⁷ A. N. Choi & C. A. Gierhart, “Intellectual Property enforcement in the Metaverse, Part 1”, *Holland & Knight Masters of the Metaverse Blog*, <https://www.hklaw.com/en/insights/publications/2022/10/intellectual-property-enforcement-in-the-metaverse-part-1> accessed 27 May 2024.

⁶⁸ For instance, in the broadcasting scenario copyright holders license their film to different broadcasters, which may limitedly sublicense the broadcast rights to other operators in order to technically carry out the act of communicating it to the public.

⁶⁹ C.L. Saw & Z.W.S Chan (30), “The subsistence and enforcement of copyright and trademark rights in the metaverse”, at 2.

⁷⁰ As S. Park & Y. Kim in Y.K. Dwivedi et al (11), “Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy”, at 9, postulated the market within the metaverse will grow and help in turn to construct a sustainable metaverse world.

⁷¹ Here the logic developed by CJEU on judgment of 3 July 2021, case C-128/11, *Used Soft v. Oracle*, may come in place, although as CJEU Judgment of 19 December 2019, clearly limited the *Used Soft* doctrine to Directive on the legal protection of computer programs and outside of the scope of Art. 3 Infosoc Directive, which would be the rule applying in this case. However, parties of the licensing agreement may still establish voluntarily a *Used Soft* transfer clause in order to allow for the creation of a virtual second-hand market in the metaverse that replicates easily enough analogical markets.



which means that it will be necessary to keep track of all the intermediate licenses that have taken place between the first and the last ones, making it extremely burdensome to do so in a context where there is no longer any vertical organization of the communication. As we have theorized, once the asset is put into commerce in the metaverse it is intended to function as a real-world object or a commodity, so it can be transferred through an indefinite number of users, some of whom will be professionals, some of whom will be end users, making it very difficult to establish a clear, organized flow of copyright transfers, thus creating a multipolar licensing scheme.

In the absence of a mechanism to facilitate this flow of transactions, the system will tend towards concentration rather than decentralization of licensing, i.e. the orchestrators, whether in the form of DAOs or under a platform structure, will be the ones managing the licensing of assets⁷², becoming a central regulator in the realm⁷³. The world owner will then require of the creators to sign a global license agreement for the reproduction, communication and, more generally, the economic exploitation of the digital asset, thereby perpetuating the asymmetry and the bargaining weakness of creators⁷⁴.

The platform will then commercialize the assets according to the license agreement and will likely ensure that the user license provided to metaverse participants is strictly limited to the realm in question, raising interoperability issues. Said interoperability is a quality to be achieved by the orchestrators providing the technical infrastructure⁷⁵, but the need for truly interoperable standards may be trumped on the orchestrator's side, as the incentive provided by licensing solutions favors concentration, thus frustrating users' expectations of being able to use their assets seamlessly across different realms of the metaverse^{76/77}.

A license-based metaverse seems to be nothing more than a projection of Web 2.0 value chains and problems onto a third dimension, frustrating the philosophical underpinnings of the metaverse as a major focus of the Web 3.0⁷⁸ movement, which aims for a more democratic Internet where transactions and information take place everywhere, rather than being concentrated in a few platform ecosystems⁷⁹. This scenario may be the

⁷² Schobel & Leimeister (8), "Metaverse Platform Ecosystems", *Electronic Markets*, at 4-5.

⁷³ M. Janssen in Y.K. Dwivedi et al (11), "Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy", at 13.

⁷⁴ This is the operating system followed by some proto-metaverses such as Roblox. See A. Ramos Gil de La Haza, "Protección de las creaciones intelectuales en el metaverso", in A.Lopez Taurrella Martinez, *Protección y gestión de la propiedad intelectual en el metaverso* (Reus Madrid, 2023), 119-166, at 147.

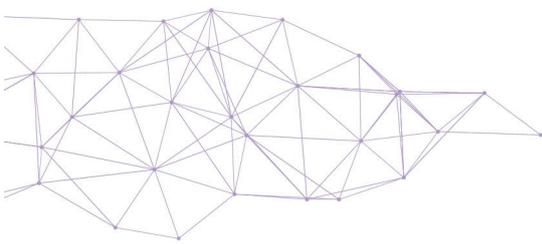
⁷⁵ Once again Schobel & Leimeister(8), "Metaverse Platform Ecosystems", *Electronic Markets*, at 4.

⁷⁶ C. Munoz Ferrandis & V. Zafarilla Diaz Marta, "Interoperabilidad y Metaverso: Dinámicas de Mercado, Acceso y Derecho de la Competencia" in A. Lopez Taurella Martinez(ed) *Protección y Gestión de la Propiedad Intelectual en el Metaverso* (Reus, Madrid, 2023), 43-73, at 45.

⁷⁷ We could end with the copyright regime countervailing its natural function; as a Complex Adaptive System, Copyright (IP in general) should function as a business tool for value creation and a vehicle for investments in a transactional context between creators and society, see. S. Kamperman & A. Moerland, "Intellectual Property as a Complex Adaptive System", in Kamperman & Moerland, *Intellectual Property as a Complex Adaptive System: The role of IP in the Innovation Society*, (Edward Elgar, Cheltenham, 2021) at 3. This could very much mean that IP is a tool for opening markets, innovation and creating commerce, not an instrument to be used detrimentally for said phenomena.

⁷⁸ According to V. Jimenez Serrania (9), "Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios", at 251, at least the decentralization of the metaverse is connected to Web 3.0.

⁷⁹ A growing line of work criticizes this model as resembling some sort of archaic feudalistic structure; see in no particular order A. Ezrachi & M. Stucke, *How Big-Tech Barons Smash Innovation - And How to Strike Back*, (Harper Business, 2022); N SRNICEK *Platform Capitalism*, (Polity Press, 2016); D ARDITI *Digital Feudalism*:



final stage in the development of the metaverse, but we need to consider a digital tool aimed at changing how the entire system of Web 2.0 works: Blockchain and its applications, in particular Non-Fungible Tokens.

3. NFTs: A technological solution to a legal conflict?

3.1. NFTs and their role in the commerce of Digital Assets

In parallel with, and most likely because of, the shortcomings of the current digital asset ownership model, the construction of Web 3.0 turned to blockchain to provide technological solutions to legal problems. Thanks to this development, Non-Fungible Tokens emerged and quickly became a bubble⁸⁰, sparking a heated debate about what NFTs may or may not be and what they can or cannot do.

Given the limitations that a licensing system can impose on the much-needed free transfer of goods⁸¹, NFTs could become the new tool for enabling digital asset ownership. However, in order to consider this new perspective, it is necessary to clarify the technical nature of NFTs, since the legal analysis depends entirely on how they work⁸².

The basis of NFTs is the so-called blockchain, a distributed database (Decentralized Ledger Technology -DLT) capable of recording all types of information⁸³ and allowing for a permanent and public record of all transactions taking place by annexing information to the blocks compounding the registry⁸⁴.

A token could be further defined as a digital unit of value recorded on the DLT, capable of representing anything⁸⁵, whether it is digital, physical⁸⁶ or “physical”. The exact functioning of the token, and therefore its capability to legally represent something, depends on how the token is specifically designed, i.e. to what standard it is built into⁸⁷. The most common standard for NFTs registered on the Ethereum Blockchain is known as ERC-721⁸⁸, although there are other interesting ones such as ERC-1155⁸⁹. The standard

Creators, Credit, Consumption and Capitalism, (Emerald Publishing, 2021); J VAROUFAKIS *Technofeudalism (What Killed Capitalism)*, (Bodley Head, 2023).

⁸⁰See <https://www.dw.com/en/nft-sale-has-the-market-bubble-truly-burst-but-do-they-have-a-future/a-67599615#:~:text=If%202021%20was%20the%20boom,%242%20trillion%20loss%20of%20value>.

⁸¹ C.L. Saw & Z.W.S. Chan (30), “The subsistence and enforcement of copyright and trademark rights in the metaverse”, at 2.

⁸² A. Guadamuz, “The Treachery of images: non-fungible Tokens and Copyright” (2021), *Journal of Intellectual Property Law & Practice*, Vol. 16, N° 12, 1367-1385, at 1368.

⁸³ B. Bodo et al (63), “The rise of NFTs: these aren’t the droids you’re looking for”, at 6.

⁸⁴ K. Werbach, *The Blockchain and the New Architecture of Trust* (MIT Press, 2018), at 11.

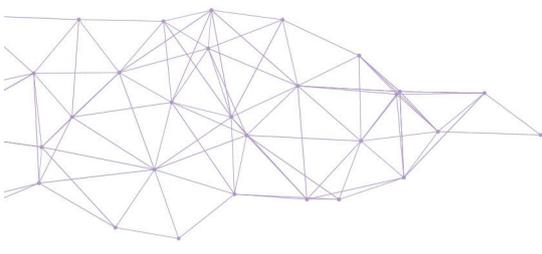
⁸⁵ A. Guadamuz (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1369; also P. Mezei & M. Foerg, “Dead or alive: futureproofing copyright in the context of NFTs” (2023), *SSRN Papers*, 1-14, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4540217 accessed 30 May 2024, at 5.

⁸⁶ R. Hofstetter et al, “Crypto-Marketing: How Non-Fungible Tokens (NFTs) Challenge Traditional Marketing” (2022), *Marketing Letters* 34, 705-711, at 705, define the NFT as a “unique unite of data that is tradeable and store on a decentralized, public blockchain along with its ownership history”; P. Mezei & M. Foerg, “Dead or alive: futureproofing copyright in the context of NFTs”, at 3 define it as “unit of digital information stored on the blockchain which is non fungible (i.e. non-interchangeable)”.

⁸⁷ V. Jimenez Serrania (18), “Web 3.0, NFTs y Propiedad Intelectual”, at 84.

⁸⁸ <https://ethereum.org/en/developers/docs/standards/tokens/erc-721/>

⁸⁹ Which according to <https://ethereum.org/es/developers/docs/standards/tokens/erc-1155/> are capable of functioning as different kinds of tokens at the same time



determines the technical capabilities of the token created and, therefore, the legal properties that can be bestowed on it⁹⁰.

Let us now delve deeper into the nature of the ERC-721 standard in order to better understand what an NFT is: according to the architecture of the ERC-721 standard, two metadata elements are required: a token ID and the contract address, and it is the combination of both data that makes the token unique⁹¹, i.e. non-fungible. The creation of an NFT is known as minting, a process that requires programming skills in order to create the token and make it readable by the blockchain architecture; once the code is sent to the Blockchain, it is affixed (or “written”) to a block, creating a timestamp of its creation⁹², making it inherently immutable⁹³.

As indicated above, anything unique can be used as basis to mint an NFT, yet the NFT is not the asset itself, but a metadata file registered on a blockchain⁹⁴. As a result of this, anything, including rights, can be minted and “vested” in an NFT. It is up to the minting party to specify, through additional metadata⁹⁵, exactly what is being tokenized each time. Thus, an NFT can best be described as a receipt representing any kind of asset and (possibly) rights to it⁹⁶. The nature of those rights will depend on the information added to the token when it is been minted⁹⁷.

⁹⁰ For instance, one will not use standard ERC-20 (fungible token standard) for non-fungible items, since properties of ERC-20 standard are designed for naturally fungible assets.

⁹¹ A GUADAMUZ (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1370; however, as J WYCZIK (62), “The Property Law of Crypto Tokens”, at 11 stated uniqueness means that there cannot be two tokens with same metadata, yet we can expect two find two tokens pointing to a same digital content, whatever the content might be.

⁹² B BODO et al (63), “The rise of NFTs: these aren’t the droids you’re looking for”, at 7.

⁹³ Except for the dynamic NFTs or d-NFTs which would allow for limited modification of the metadata. See V JIMENEZ SERRANÍA (18), “Web 3.0, NFTs y Propiedad Intelectual”, at 85, foot note 24.

⁹⁴ Similarly, A GUADAMUZ (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1370.

⁹⁵For instance, a McDonald’s “MCRIB” NFT specifically states in the description option that: “The winner (“NFT Owner”) will own the NFT. WHILE THE NFT MAY POINT TO THE ARTWORK, IT IS IMPORTANT TO UNDERSTAND THAT NFT OWNER DOES NOT OWN THE ARTWORK AND WILL NOT HOLD THE COPYRIGHT OR ANY OTHER INTELLECTUAL PROPERTY OR OTHER RIGHT IN THE ARTWORK.

NFT Owner may only sell, trade, transfer, or use the NFT in accordance with applicable law and the terms of third-party facilitators, including, without limitation, the Terms and the Rules, and NFT Owner shall only use the Artwork associated with the NFT to: (i) to market, promote, advertise and sell the NFT associated with the Artwork. This right belongs only to the current NFT Owner and automatically terminates when they no longer own the NFT.

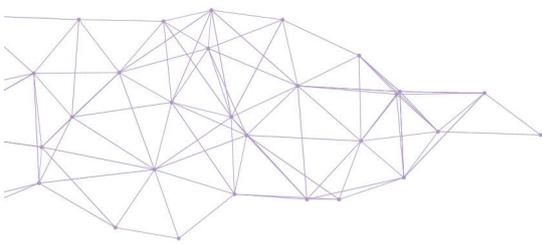
NFT Owner may not do (nor permit any third party to do or attempt to do) the following: Modify the Artwork in any way; Make commercial use of the Artwork or any element thereof or therein...”. The terms go on further detailing use conditions and other particulars. The important thing to note is that it is possible to adhere to an NFT certain rights and limit them accordingly.

See: (<https://opensea.io/assets/ethereum/0x970b632540e075043d6ac8e8c649d4d19f9be42db/1>). Last Accessed on 27 May 2024.

[Although it may be argued that the NFT description is hardly the place to include the terms of the user license associated with it.](#)

⁹⁶ A GUADAMUZ (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1370; against this view JM GARON (15), “Legal Implications of a Ubiquitous Metaverse and a Web3 Future”, at 15, considers it to be more than just a digital certificate of authenticity as it includes code that specifies conditions of ownership and transfer; also V JIMENEZ SERRANÍA (9), “Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios”, at 254-255, considers possible to link ownership transfer over the asset to the trade of the NFT.

⁹⁷ As J WYCZIK (62), “The Property Law of Crypto Tokens”, at 12 states, the sale of a token does not always lead to the buyer taking over all of the seller’s rights... all possibilities depending on individual circumstances of the transaction at hand.



The minting process requires two other intertwined steps: first, it requires a payment of its cost, usually in a cryptocurrency previously determined by the blockchain platform⁹⁸; second, in order to make the payment, but also to sign the whole process, a cryptowallet is required⁹⁹, which could be defined as a cryptographic address that exists within a blockchain¹⁰⁰ and allows for the management of cryptographic keys¹⁰¹. The NFTs are then transferred and stored in the cryptowallet that signed the operation, and the assets are ready for distribution.

The most problematic aspect of minting NFTs is the entitlement of the subject issuing the procedure, since the value of the Tokens depends on what rights are embedded in them, and it is only legally logical to consider that one cannot issue NFTs containing rights that one does not enjoy himself, i.e. problems of authenticity arise.

However, there is an effective solution to this problem: since the DLT does not verify the veracity of the claims made in the minting process an *ex-ante* control is being carried out in the form of Oracles, an intermediary infrastructure/ operator that verifies whether the information submitted in the NFT is true¹⁰² and that the person commanding or performing the act of minting is actually authorized to do so. Thus, once the NFT technology is properly developed, the initial issues of uncertainty should no longer be relevant.

Once the minting process is completed correctly, the result obtained would be a unique and indivisible representation of a digital or a physical asset¹⁰³. Asset and representation via NFT are not to be confused¹⁰⁴. This “receipt” is then able to function properly on its own thanks to the pre-programmed instructions introduced by the minter known as a *smart contract*. A *smart contract* can be described as a few lines of code capable of self-executing¹⁰⁵ once the conditions for activation are met, automatically overwriting data on the blockchain. While there is still debate as to whether smart contracts can be considered real contracts¹⁰⁶, as typical contract components may be missing, their I-T-E (if-then-else) structure¹⁰⁷ allows for an easy way to execute contracts on the internet and in the future metaverse.

This means that two parties, despite lacking mutual trust, can still commit to a strictly bilateral transaction, without the involvement of a third party acting as an intermediary. This allows for the perfect decentralization of online and virtual commerce.

⁹⁸ V. Jimenez Serania (18), “Web 3.0, NFTs y Propiedad Intelectual”, at 82.

⁹⁹ Ibid.

¹⁰⁰ A. Guadamuz (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1370.

¹⁰¹ J. Wyczik (62), “The Property Law of Crypto Tokens”, at 16.

¹⁰² V. Jimenez Serrania, “El uso de tecnología blockchain en la protección y gestión de derechos de propiedad intelectual”, in E ORTEGA BURGOS et al *Propiedad Intelectual 2021*, (Tirant lo blanch, Valencia, 2021), 217-239, at 226-227

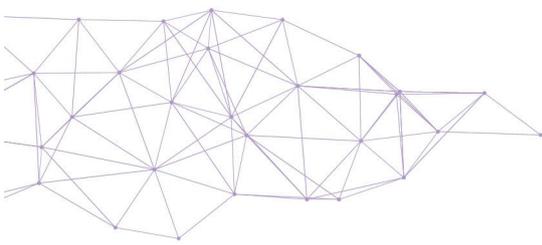
¹⁰³ V. Jimenez Serrania (18), “Web 3.0, NFTs y Propiedad Intelectual”, at 92.

¹⁰⁴ E. Lee, “NFTs as Decentralized Intellectual Property” (2023), *Univ. of Illinois Law Review*, 1049-1122, at 1054.

¹⁰⁵ V. Jimenez Serania (102), “El uso de tecnología blockchain en la protección y gestión de derechos de propiedad intelectual”, at 224.

¹⁰⁶ A. Guadamuz (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1374; as of today we can state together with V. Jimenez Serrania (9), “Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios”, at 258, that smart contracts used in the NFT environment are very basic regarding what metadata include, thus making them not appropriate to be considered legal contracts yet.

¹⁰⁷ D. Puterbach “The future of contracts: automation, blockchain and smart contract” (2016), 34 No. 10 ACC Docket 48, issue 10, at. 50; V. Jimenez Serrania (18), “Web 3.0, NFTs y Propiedad Intelectual”, at 89.



All transactions taking place between peers regarding an NFT are recorded on the blockchain or any other DLT, making it easy to trace the ownership of the NFT back to its minter¹⁰⁸. If the minting process is properly controlled, and only the creator of the digital work or the owner of the physical asset are able to mint NFTs from them, then we get a secure way of trading goods, through the free exchange of assets between parties. The risk of contract default is non-existent, as once the conditions programmed in the smart contract are met (if), the program will automatically self-execute and overwrite the data in the blockchain. As the data on the blockchain does not disappear, but it is modified within another block, it is easy to trace back transactions, making them secure.

With respect to digital assets, NFTs offer a second crucial advantage: the main challenge associated with digital goods is the potential for infinite replication, a concern that has eluded traditional technological protection measures, since any technology can be undone and eliminated. Nevertheless, because blockchain provides an immutable registry of all transactions, the only feasible way to overwrite data would be to force a consensus among the nodes conforming the chain¹⁰⁹. This, however, leads to an intriguing conclusion: the digital good associated with an NFT could be considered original (in the sense of unique) and scarce, rendering the rest of the potential reproductions worthless copies¹¹⁰.

Moreover, thanks to the NFT, the original file is not absolutely copyable which means that it is impossible for two users to possess the file at the same time. This allows for a new method of distributing digital assets that does not depend on traditional licensing schemes and provides a new approach to the ownership of digital assets that is separate from the reign of ToS¹¹¹.

3.2. Limitations of the NFT technology: licensing schemes for metaverse “ownership”?

However, NFTs are not without their limitations, a major one being the problem of conferring any sort of legal effect on them. In this sense, should a user mint an NFT allegedly containing a property right to his house, a flexible interpretation might see the token – understood as a receipt representing property¹¹² – as a way of effectively trading property over the real state, much as the *traditio ficta* doctrines work in continental law¹¹³.

¹⁰⁸ B. Bodo et al (63), “The rise of NFTs: these aren’t the droids you’re looking for”, at 8.

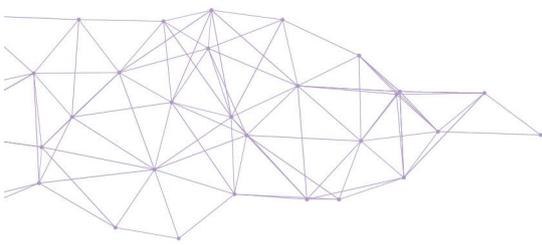
¹⁰⁹ Something that is currently technologically unfeasible, since current computers lack the sheer brute force to execute this successfully. Perhaps quantum computing may pose a threat to current cryptographic techniques.

¹¹⁰ V. Jimenez Serrania (18), “Web 3.0, NFTs y Propiedad Intelectual”, at 92; also E. Lee (103), “NFTs as Decentralized Intellectual Property”, at 1101, clearly states that the unauthorized copies do not substitute for the one authenticated by the NFT.

¹¹¹ J. Farchald., *Owned: property, privacy and the new digital serfdom*, Cambridge University Press, 2017; as J Wyczik (62), “The Property Law of Crypto Tokens”, at 62 indicates platform providers are not parties to the transaction, the people who offer to sell specific tokens are; so why would be platforms entitled to determine in their ToS the rights vested on each token?

¹¹² As S. Koos in Y. K. Dwivedi et al (11), “Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy”, at 12, proposes virtual objects could be expressed and objectified by tokens, thus potentially being subject to property rights.

¹¹³ Following what A. Guadamuz (82), “The Treachery of images: non-fungible Tokens and Copyright”, at 1375, states any kind of agreement can be coded into an NFT; as J. Wyczik (62) “The Property Law of Crypto Tokens”, at 12 indicates it seems (logical) that the buyer will want to acquire the full rights arising from the typical purpose of the goods associated with the token.



After all, NFTs are designed to allow resale and transfer between peers without recourse to third-party *bona fide* intermediaries¹¹⁴.

However, where IP rights are concerned, caution must be taken, as we may be dealing with two different sets of rights: limited ownership of the asset and IP, relating to two different, yet intertwined, objects of protection – *corpus mechanicum vis a vis corpus mysticum* – and probably with two different right holders. Here is where all consensus ends.

It is generally agreed that the purchase of an NFT does not automatically translate into the purchase of copyrights¹¹⁵; on the contrary, the NFT is not a work (or a design), but a receipt¹¹⁶ granting only a limited form of ownership (quasi-ownership)¹¹⁷, the use of which is again determined by licensing agreements, ToS and T&C of different actors¹¹⁸.

But does this mean that we are back to square one? Quite the opposite, since NFTs generate a kind of duality or divorce in the nature of ownership of digital goods¹¹⁹, pretty much in the same way in real life with IP protected subject matter¹²⁰. We can say that there is a solid tendency to consider NFTs as a separate appropriable asset¹²¹, probably carrying with it the property right over the digital asset attached to it, unless the parties to the transaction state otherwise¹²². The only difference, which is not negligible at all, is that in the case of a digital asset, most acts of use will imply reproduction (mostly for technical purposes) and/or making available to the public, meaning that a licensing agreement should accompany the tokenized digital asset.

One may try to create some leeway in the form of an implicit license over minimal uses of the tokenized work, since it's the very nature and goal of tokenization to allow for easy trading and use of digital assets¹²³. However, these user rights must remain minimal, limited to non-commercial uses catered to the nature of the asset in question¹²⁴, yet the

¹¹⁴ E. Lee (104), "NFTs as Decentralized Intellectual Property", at. 1100.

¹¹⁵ B. Bodo et al (63), "The rise of NFTs: these aren't the droids you're looking for", at 21.

¹¹⁶ A. Guadamuz (82), "The Treachery of images: non-fungible Tokens and Copyright", at 1371.

¹¹⁷ B. Bodo et al (63), "The rise of NFTs: these aren't the droids you're looking for", at 21; in the same vein P. Mezi & GC Arora (13), "Copyright and Metaverse", at 8; E. Lee *Creators Take Control: How NFTs Revolutionize Art, Business, and Entertainment* (Harper Collins, 2023), at 88-89 speaks of a new type of ownership constructed by a mixture of legal (license agreements) and technological components (NFTs and smart contracts).

¹¹⁸ As M. MacDonald (16), "The intersection between IP and the Metaverse: Preliminary observations", at 4, already pointed out.

¹¹⁹ As J. Wyczik (62), "The Property Law of Crypto Tokens", at 21 points out we need to distinguish between the right to dispose of a token and the right to dispose of the goods associated with it. Meaning that up to three different layers can be identified: 1) Rights to the token as a good in itself; 2) Rights to the assets represented by the token, and 3) Intellectual Property that might be embedded or otherwise associated with it.

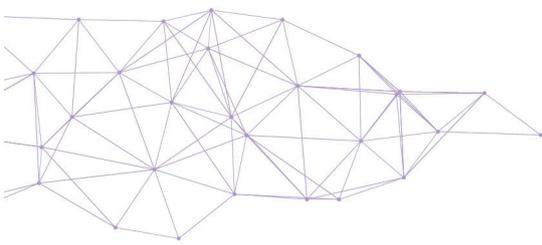
¹²⁰ For instance, the owner of a picture is limited in the exercise of its property right, meaning that it can use its property, obtain fruits from it (*usus and fructus*), yet it cannot abuse (i.e. make antieconomic use of the good), not fulfilling the classical definition of property as "*ius utendi et abutendi re sua*" typical from the continental-roman tradition.

¹²¹ As have determined British courts on decisions *Osbourne v Persons Unknown* [2022] EWHC 1021 (Comm) [13] and *Janesh s/o Rajkumar v Unknown Person* ('CHEFPIERRE') [2022] SGHC 264 [45]-[78]. Furthermore, UNIDROIT *Principles on Digital Assets and Private Law*, 2023, principle 6, at 52 states that "control" (the right vested by the organization on digital assets) would be the functional equivalent of what possession is to movables, meaning that control of the asset together with a legal entitlement could be used for constructing a notion of digital property.

¹²² In this vein J. Wyczik (62), "The Property Law of Crypto Tokens", at 61.

¹²³ See B. Bodo et al (63), "The rise of NFTs: these aren't the droids you're looking for", at 9.

¹²⁴ For instance, where the asset is a picture, public communication of it in social media and personal profiles through the users' profile image may be on point if we are not to deprive the NFT and its market of absolutely all value.



multilayered dimension brought about by the metaverse may not allow for an easy translation of those uses¹²⁵, once again greatly increasing frictions, and preventing the 1:1 functional likeness of real and virtual world interactions.

Thus, NFTs allow for a division of sorts regarding ownership of the work fixated in the digital asset. Drawing on the classical differentiation between *corpus mysticum* and *corpus mechanicum* typical of copyright law, is reasonable to assume that NFTs may allow for the acquisition of some form of ownership over the *corpus mechanicum* in which the creation is embodied, i.e. the digital asset in its narrowest sense possible¹²⁶.

NFTs provide unique access and limited use of equally unique assets, whether digital or physical, but also allow for the data to be immutable. This would ensure that when speaking of digital assets, users cannot modify their properties, something that is fundamental for Web 2.0. NFTs business model, focused on digital art and collectibles, but could be detrimental to the creation and extraction of value in a virtual environment, thereby stifling innovation and making the metaverse less attractive.

If the virtual worlds compounding the metaverse are to be truly immersive¹²⁷, digital objects, avatars, etc. should be able to interact with each other, which means that virtual worlds will need not only a graphics engine but also a physics one as well like many other digital environments (such as videogames¹²⁸). This means that digital assets need to be modifiable in a limited way, e.g. they should be able to interact with other objects to allow them to be stacked, overlapped or resized according to the user's needs¹²⁹. If the 3D model does not allow for certain manipulations because it is made immutable by tokenization, the graphical limitations and abundant glitches may deter users from entering the metaverse. A technical solution probably already exists, although from a legal point of view the question is more complex. The mere act of displaying the model in the metaverse of choice requires the reproduction of the file, which means that the right of reproduction could be infringed. Furthermore, any change, however minimal, to the original would amount to a transformation or an adaptation of sorts, thus requiring further licensing. Finally, the public use or display of digital assets, which is prone to be central to the metaverse value chain, will also require further authorization as it could be considered as communication to the public and/or making available.

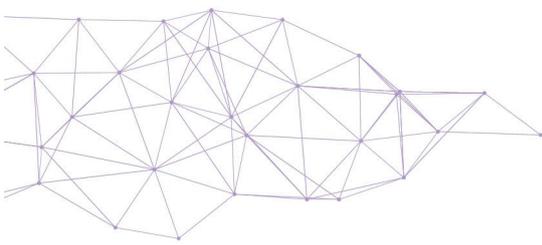
¹²⁵ For instance, if I have an NFT of a picture, can I publicly display it on a public personal space I have also bought in a virtual world? Or would it amount to copyright infringement? If I combine the picture with the engine in order to create a replica of the picture to be displayed as a picture, do I infringe upon the license? And if I convert the image into the wallpaper of said space?

¹²⁶ This is particularly visible with utility tokens, meaning tokens that provide the user with the ability to do or demand something, for instance the attendance to a festival. Once the tokens are distributed through the official channel of choice, the users may resell them, and with the NFT they sell also the functionality or utility the token entitles them to use, thus the transfer of the NFT allows for the transfer of the entitlement, an effect that could be extended to rights and, particularly property and intellectual property rights. This would allow them to defend the transmissive effect of NFTs over assets represented by them, insofar that is the will of the parties.

¹²⁷ According to S. Park & KIM in Y.K. Dwivedi et al (11), "Metaverse: beyond the hype: Multidisciplinary perspective on emerging challenges, opportunities and agenda for research, practice and policy", at 4, immersion is essential for both user participation and the sense of continuity in the virtual world, yet it shouldn't be excessive if we are to avoid psychological problems in users.

¹²⁸ A. Ramos Gil de la Haza (74), "Protección de las creaciones intelectuales en el metaverso", at 121; see also A. Lopez Tarruella Martinez (14), "Definiendo el metaverso", at 29-34.

¹²⁹ With clothing, for instance, even with currently normalized avatars, some modicum of fitting is in place, in order to make sure that the 3D model used fits properly and does not disturb the graphical functioning of other models (glitching).



These problems are not new, they have already been discussed in relation to Web 2.0 NFTs, yet what can be already noted is that the virtual nature of the metaverse will increase the number of uses requiring authorization, making it much more difficult to properly organize and channel all the possible uses into license agreements. Then those agreements should be attached in some way to the NFT so that the different agents (users, providers, creators and orchestrators) know which uses are allowed and which ones are not. The need to constantly trace the usability of the asset back and forth through various license agreements is bound to freeze the disintermediated secondhand traffic, frustrating two of the basic principles of the metaverse: the unification of the virtual and analogue worlds, since they won't be operating in a remotely similar manner, and disintermediation, since the only way out would be a new kind of intermediaries, responsible investigating and informing about the permitted uses of each asset, and possibly negotiating new licenses on behalf of the users¹³⁰.

4. Developing virtual markets: convergence of technological and legal realities

Replicating in the metaverse the very same copyright management structure that has existed for decades now in the analogue world, and which has had important enough issues and problems to trigger a whole movement seeking an alternative solution, is probably far from the intentions of digital creators¹³¹.

Instead of exploring this possibility, we believe that our efforts are best invested in exploring some alternatives that are more suited to the virtual nature of the digital worlds.

4.1. Exhaustion doctrine and its application to digital uses of virtual assets

One possible response to the metaverse needs, already considered albeit in a web 2.0 context, would be to rely on the doctrines of first sale or exhaustion (depending on which side of the Atlantic we are on). Focusing on the EU exhaustion doctrine, it should be noted that it has only been considered limited to distribution right, i.e. the resale of physical goods containing a copyrightable work.

We could consider applying the variant of interpretation of digital exhaustion established by CJEU in the UsedSoft case¹³², so that it can apply where the parties ensure that the act of trade is not a mere reproduction, as the selling party loses all access to the asset and thus to the copyright, if any. NFTs are easily one of the most appropriate tools to allow a fully traceable transfer of assets.

¹³⁰ They could be considered as the mixture of the virtual counterpart of copyright management entities and NFT oracles but tasked with the management of potentially the license of all or almost all assets in a certain virtual realm. Very much like in the real world, they could also be in charge of managing and licensing portability of assets between realms, as they license international uses thanks to representation agreements, allowing for some sort of unique window per digital realm in charge of the managing of the whole copyright infrastructure.

¹³¹ As E. Lee (104), "NFTs as Decentralized Intellectual Property", at 1058, puts it, current copyright law regime (he refers to the USA Copyright Act of 1976) is outdated, highly technical and overly complex, and a terrible fit for the Internet and digital technologies and copies. So, one can hardly see digital artists and creators turning again to classical management models, provided by a regime not fit for their necessities.

¹³² CJEU Judgment on 3 July 2012, C-128/11, UsedSoft GmbH v. Oracle International Corp. ECLI:EU:C:2012:407.

An alternative explanation has also been offered taking into consideration the technical build of an NFT¹³³, which is ultimately through the linking of the asset from outside the blockchain¹³⁴. Important scholars have focused on this technological means and have argued that the transfer of an NFT is the purchase of the access link¹³⁵, both limiting the right acquired to mere access and, at the same time, including the whole operation in the communication to the public right category, since the CJEU had already stated that linking is tantamount to communicating something to the public in the Internet¹³⁶.

Both proposals are focused on the current Web 2.0 NFT value chain and mode of operation yet omit how it could be implemented with the path set for the metaverse. On the one hand, exhaustion/ UsedSoft doctrine, is limited to acts of transfer of the assets and does not extend to further uses such as exhibition, transformation/adaptation or use in public, which theoretically remain bound by licensing agreements.

On the other hand, considering NFTs as linking could help unburdening resellers, since according to the Svensson doctrine once the work has been made available to the public and the act of linking does not extend access to a new public (i.e. a public not contemplated by the author when giving the initial consent), the acts of linking do not infringe any author's rights. Again, it is quite unclear how that flexibilization may work when assets are not transferred per se, but with the aim of being publicly used. Could the concept of public and new public, already heavily criticized¹³⁷, be extended as to cover the majority of public uses of assets in virtual worlds? And if so, two further questions arise: a) Is it possible to consider the metaverse as a unique global public, even though it is highly likely that it will, to some extent or for some time, acquire a fragmentary nature?; b) Is it possible to extend the logic to the innocuous technical acts of reproduction, transformation and adaptation that will be necessary to integrate the assets into the metaverse engine? The answer to both questions will probably be a "no".

Web 2.0 thought solutions are not adequate to solve what we can call the "metaverse license problem". It is clear that "simply" trimming the copyright legal structure to fully liberalize use does not improve the situation, on the contrary: it negatively affects copyright holders and creators without properly solving the main problems and creating further legal uncertainty.

Only a Web 3.0 specifically designed response could strike the right balance between allowing a functional metaverse market, with ease of transactions compatible

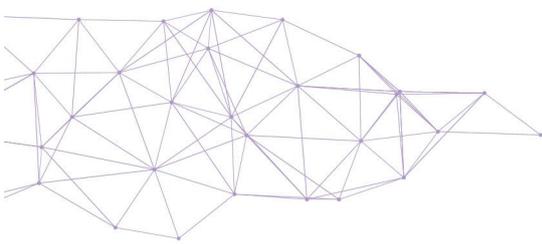
¹³³ As J. Wyczik (62), "The Property Law of Crypto Tokens", at 17 explains that an NFT is multilayered in its nature, being comprised of a smart contract database containing a hash hiding a link to a metadata file in which individual token attributes are specified, some of which contain a second hash hiding a link pointing to the digital file itself.

¹³⁴ As blockchain storage is designed to be limited and costly, most minters what they do is create the token not with the uploading of the asset directly to the blockchain, but only including a link to it in the chain, thus, the NFT does not contain the image or model of the asset but a link to it. The work or asset is stored in a server (normally an IPFS) allowing for an easy and cost-efficient way of structuring NFTs. See V. Jimenez Serrania (9), "Fashion in the metaverse: protección de la moda tokenizada, infracciones y remedios", at 257.

¹³⁵ For instance, B. Bodo et al. (63), "The rise of NFTs: these aren't the droids you're looking for", at 25; also, P. Mezei & M. Foerg (85), "Dead or alive: futureproofing copyright in the context of NFTs", at 3.

¹³⁶ CJEU Judgment on 13 February 2014, C- 466/12, Nils SVENSSON v. Retriever Sverige AB ECLI:EU:2014:76.

¹³⁷ See for instance the ALAI "opinion proposed to the executive committee and adopted at its meeting on 17 September 2014, on the criterion "New Public", developed by the CJEU, put in the context of making available and communication to the public", *passim*, particularly at 2, 10 and 13-19, available at <http://www.alai.org/en/assets/files/resolutions/2014-opinion-new-public.pdf>; critical too on the concept of new public see E. Rosati "When does a communication to the public under EU copyright law need to be a new public?" (2020), *European Law Review*, 45, Issue 6, 802-823.



with the copyright licensing-based scheme, and the copyright holders interests. As to how this solution is to be achieved, we propose in the next section a draft. However, two things strike us as clear: 1) the solution should focus on the management of license agreements rather than on slimming the copyright law regime; 2) whatever direction it takes, it should be compatible with Web 3.0 technology, i.e. it should have some sort of technological transcription, so that compliance could be achieved automatically and by design.

4.2. New ways of organizing IP management: towards a technologically implemented piecemeal approach to licensing

New realities require novel legal frameworks, so, while we recognize in principle that copyright rules are fully applicable in the metaverse¹³⁸, some adaptation could benefit both, the metaverse as a new reality and copyright compliance as a prerequisite to be built into said virtual reality¹³⁹.

Considering that our goal is to create a management tool rather than to reducing the copyright protection, we turn our attention to a licensing system that is currently in operation: Creative Commons¹⁴⁰. Widely known, especially in academic circles, what is interesting about the Creative Commons framework are two key aspects: 1) its modularity, which allows creators to personalize the license provided by combining what we can call “copyright modules” that allow or prohibit certain clearly defined uses¹⁴¹; 2) its machine-readability, which allows search engines and automatic systems to index or de-index the work according to the metadata files attached to it.

The Creative Commons framework allows for the creation of a standardized, yet sufficiently customizable licenses that accompany the protected work (floating umbrella license) by the creators, allowing both users and technological infrastructure providers to know in real time what can and cannot be done with the work¹⁴². This framework could pretty much be implemented together with NFTs and blockchain technology, to allow both user freedom and author control over all that occurs to the digital assets once they are commercialized¹⁴³. In fact, it is currently being implemented in some interesting initiatives

¹³⁸ P. Mezei & G. C. Arora. (13), “Copyright and Metaverse”, at. 13.

¹³⁹ For instance, Jimenez Serrania (9), “Fashion in the metaverse: protección de la moda tokenizada: infracciones y remedios”, at 252 footnote 13, gives us account of some initiatives undertaken by EUIPO in order to manage through blockchain technology Trademark and Design repositories (TMView and DesignView, respectively), allowing for better tracking of licenses and assignment of rights. This seems a good idea, but it would be hard to undertake in the copyright realm, since no registry is strictly compulsory for copyright to arise.

¹⁴⁰ According to J.E. Rothman, “Copyright’s private ordering and the Next Great Copyright Act” (2014), *Berkeley Technology and Law Journal*, Vol. 29, 1591-1649, at 1625, is an initiative that aims to layer on top of existing copyright law a formalized licensing regime.

¹⁴¹ For instance, share alike tackles the sharing issue determining that the user is allowed to publicly share the copy in the exact same conditions he has received it.

¹⁴² Thus, fusing what E. Lee (117) *Creators Take Control: How NFTs Revolutionize Art, Business, and Entertainment*, at 88-89, still considers as two separable realities: mixing legal code and programming code, making technology to provide means to effectively apply legal prohibitions on the Internet.

¹⁴³ In this way, technological private ordering is not used exclusively as a Digital Right Management tool nor only as a CC license (as suggested by E LEE [103], “NFTs as Decentralized Intellectual Property”, at 1066 and 1073) but it collapses both uses into one: a modular, machine-readable license would be not only a license in itself, but a Digital Right Management tool allowing the author full control of uses, while the Blockchain guarantees buyers that no sudden change of terms can take place, at least without their consent.

within the NFT community¹⁴⁴. Looking more closely at the possibilities offered by this modular framework or piecemeal licensing system, authors would be able to choose easily and on their own how they want to distribute their work and how they want it to be used and reused.

The number and type of modules must be limited and standardized, yet combination possibilities could be almost infinite. The rest of second-hand users are only allowed to transfer the license together with the digital asset but should not be able to modify the original license. The success of this novel way of organizing copyright requires that the licensing framework is designed and implemented by the community as a whole, taking into account both, the technological and business aspects of the metaverse. With regard to the problems we have identified, a licensing module could be created in order to allow or prohibit the (legal) portability of items from one virtual realm to another, or even to allow the creator to decide, when minting the NFT, which virtual realms the asset will be available for. Furthermore, in terms of the use and interaction possibilities of the asset once introduced, authors can authorize whether or not the asset can be reproduced for graphical engine compatibility purposes, whether or not it can be modified and adapted, whether or not it could be used to generate a new asset—allowing for co-creation and customization business models; or they could completely forbid the introduction of the tokenized asset into the metaverse at all.

The other side of each of one of the license modules would be a piece of programming code, a line that could be inserted into the NFT during the minting process, perhaps in the form of metadata, and that would allow the systems to read which permissions are attached to the file, enabling the making of any representation of said asset in the virtual world copyright-compliant by design, as only some uses will be possible, thus making the user completely and aware of what the capabilities and limitations of the item are¹⁴⁵.

If the proposal made above is further developed by the community of creators and early users of the metaverse, and a standardized way of licensing is agreed upon, then the only limit to a seamless, unique and interconnected world would (still) be the technological interoperability barriers that the different orchestrators may erect. In this development, however, this end result could not be seen as being caused by the exclusivity regime of intellectual property, but clearly being a byproduct of the egoistic interests of platforms and other Web 2.0 operators aiming to expand their position into Web 3 ecosystems as well.

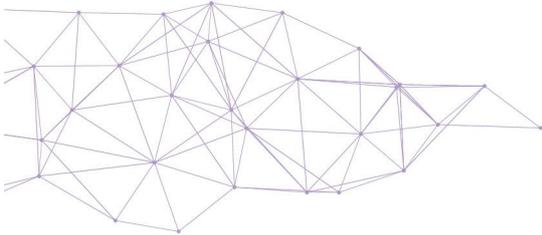
¹⁴⁴ For instance “Nouns” (see <https://nouns.wtf>) initiative XCOPY (<https://xcopy.art/2>) and Moonbirds project (<https://www.proof.xyz/moonbirds>) are operating now under what is known as CC0, relinquishing copyright over the tokenized images and setting all value precisely on the NFT technology as a means of managing creators interests. On further information about these initiatives see E. Lee (104), “NFTs as Decentralized Intellectual Property”, at 1055, 1070, 1081 and 1107-1111, where he tackles the novel “Can’t be evil” licenses created by A16CRYPTO firm, according to the author there would be 6 different possibilities: 1) full grant of exclusive commercial rights; 2) full grant of non-exclusive commercial rights; 3) full grant of non-exclusive commercial rights but prohibiting hate speech; 4) personal use only license; 5) personal uses only with hate speech restriction and 6) CC0 licenses and full abandonment of copyright. Not on a CC environment, but CREA project (<https://creaproject.io>) tried to create a unique wallet in which digital artists can store all their works and licenses, yet it failed and was finally discontinued (see their official x account tweet: https://x.com/crea_project/status/1720049499182133393?s=46&t=_ObmV0ErozOHJ3v370emXA). In the same vein ASCAP, SACEM and PRS created a blockchain project for Copyright management (see <https://www.ascap.com/press/2017/04-07-ascap-sacem-prs-blockchain>).

¹⁴⁵ Thus, using immersion as a proxy for indicating to the users what the asset is allowed or not to do, as partially considered by S von der Au et al (45), “Context in augmented reality marketing: Does the place of use matter?”, *Psychology and Marketing*, at 2448.

5. Conclusion

Building the metaverse will be a slow, long-term process that will require a lot of infrastructure, both technological and legal. Existing regimes and frameworks should not be completely ignored for the new reality but should be properly designed so that maladaptation does not trump all the economic value the metaverse has to offer.

We have focused on the problems that the current copyright regime may pose for functioning commerce in the metaverse, and the solutions that are already in place. In addition, we have proposed a new possibility: the use of modular licensing frameworks, similar to and inspired by Creative Commons, to create both a flexible enough licensing system to allow consumers to know exactly what they can do with their recently purchased asset, and to keep creators in control without disrupting or chilling the functioning of the virtual market, thus making virtual worlds in the metaverse and the real world comparable on an almost 1:1 basis, allowing for the ultimate goal of merging both digital and analogue worlds into an all-encompassing Mixed Reality.



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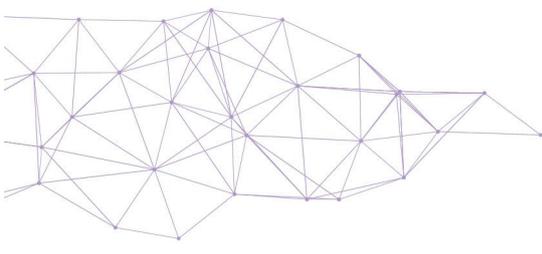
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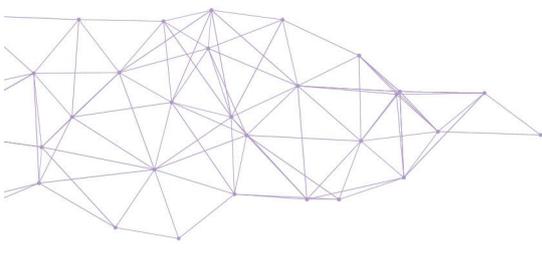
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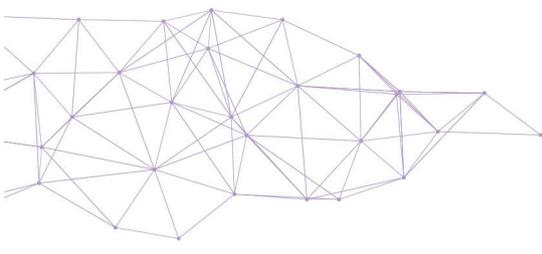
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