

Correlation

Art: Architecture : Metaverse : NFT

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I hereby certify that this master/diploma thesis has been composed by myself, and describes my own work, unless otherwise acknowledged in the text. All references and verbatim extracts have been quoted, and all sources of information have been specifically acknowledged. This master/diploma thesis has not been accepted in any previous application for a degree.

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I. Introduction

Try to use ChatGPT¹ putting the words in the title together: Art, Architecture, Metaverse, NFT. This is what I got:

“As an AI language model, I can provide you with some general information on these topics:

Art: Art refers to the creative ability to produce visual, auditory, or performance pieces that convey an emotion or thought. It could be in the form of paintings, sculptures, music, films, literature, and other expressive mediums.

Architecture: Architecture involves designing and constructing buildings and structures that meet certain functional and aesthetic requirements. Architects are trained professionals who combine art and science to create practical, efficient, and visually appealing buildings.

Metaverse: The metaverse is a term that has emerged in recent years to describe a virtual space where users can interact with one another in an immersive 3D environment. It is a concept that has been popularized in science fiction, and it is now being developed by tech companies as a platform for social networking and entertainment.

NFT: NFT stands for non-fungible token, which is a type of cryptocurrency that represents a unique item or asset. It is typically used to represent digital art, collectibles, and other types of virtual assets. NFTs have been gaining popularity in recent years as a way for creators to monetize their digital work and as a new form of investment.

When combined, these concepts can potentially create new ways for artists and designers to showcase their work in immersive digital spaces,

¹ www.chatgpt.org

monetize their creations through NFTs, and integrate technology with art and architecture to create exciting new experiences in the metaverse.”

The last paragraph exactly describes the genuine interest in the combination of these fields, or as wisely formulated by AI: these concepts.

The presented thesis² starts with the question of architecture being art. Definition of the idea of art and the possible congruence with architecture are researched to then blend into architecture as art that can be brought to the market in the vase of an NFT.

From there the architectural approach transfers into virtual reality and the question arises whether architecture is need in a metaverse surrounding or if game designers' approach would be more than sufficient.

Creating the metaverse strongly relies on the use of NFTs, so in the last chapter of the thesis an overview on the legal perception of NFTs is given, considering one exemplary NFT with the aim to find the relevant questions more than possible answers.

The work concludes with some thoughts on the correlation of the title concepts but leaves out fact-based conclusions, as there are none, at least not at this stage of this fairly new enterprise of getting architecture as a form of art into metaverse, protected and piled up with NFTs. Only mandatory conclusion upfront: While your read, most of what you perceive is outdated already.

² Explicitly not using AI for the text.

II. Art : Architecture

1. Introduction

Mike Winkelmann became a two-digit millionaire a year ago, on March 11, 2021. He sold “Everydays: The First 5000 Days” an NFT of a digital collage. The work of the self-declared graphic designer (is this a preliminary stage to visual artist, one may ask) was sold in auction at Christie’s for 69.3 million USD. This sale leads to the definition and understanding of **art** in virtuality.

An **NFT**, short for non-fungible token, is

“a non-interchangeable unit of data stored on a blockchain, a form of digital ledger, that can be sold and traded. (..) NFT ledgers claim to provide a public certificate of authenticity or proof of ownership, (..).”³

In 2014 the first NFT was created by Kevin McCoy and Anil Dash of a video clip made by Jennifer McCoy and sold for 4 USD. The transaction was referred to as “monetized graphics”.

Between 2014 and 2017 Ethereum blockchain produced Etheria NFTs which were hexagonal tiles that only sold in 2021 when NFT hype unfolded. Crypto Punks, rare Pepe trading cards and of course CryptoKitties brought attention to NFTs. But only 2020 the market took up speed and the total value of sales raised to 250 million USD, ever since still rapidly increasing.

NFTs are used in digital art, in games of course, representing in-game assets such as digital plots of land, in music as a combination of artwork and music, in film, where posters are sold as NFTs, and as well as so called internet memes. Varieties of use of NFTs evolve to any imaginable item that can be traded. The sense of NFTs as a guarantee of ownership leads to many more markets than only the art market which obviously evolved the use and spread of NFTs and

³ https://en.wikipedia.org/wiki/Non-fungible_token

still has a major impact on the scene. In 2020, practically out of the blue, the interest of art collectors in NFTs rose to 33%.

With the rise of NFTs in art market the use of so called **metaverse** was enhanced as well. Metaverses defined as 3D virtual worlds are mainly referred to as gaming platforms such as *Second Life* or *Decentraland* and *Sandbox*. Virtual worlds are about to be built by different market players such as Meta Platforms (former Facebook), HTC with Viverse etc. The expected applications for metaverse will include interactive learning, e-commerce, real estate, art and luxury brands. Augmented reality can be achieved by adapted hardware such as VR headsets including sensors and high-definition displays.

NFTs as a guarantee of ownership get implemented in metaverse to make items tradeable independently from the game creator. These NFTs can be implemented to the metaverse, can be used, and shown in virtual reality but can be transferred and traded independently and according to exclusive decision and direction of the wallet user, who presumably owns the content of the wallet such as blockchain based currency and NFTs.

The more traffic is generated on in metaverse environment the more interest goes to the looks and feels of the space. How can you stand out in a virtual environment and how can you attract the businesses and audience you want, in order to see and sell your NFTs? This is where **architecture** finally comes in. This is where the creation of the metaverse by game designers finds a limitation. The looks and feels of metaverse as of today are basic, driven by gamers as visual effects seeking customers, and all quite present the same level of aesthetics, if one can think of this word in combination with basic metaverse applications such as Decentraland. However, the interest of the users creates the need of architectural work in metaverse. Questions such as social function, design, aesthetics, phenomenology, semiology, and style want to be discussed⁴. And this is the thinking and the work of an architect⁵ (FN Zumthor, thinking architecture). This leads us to the question what architecture

⁴ Patrik Schumacher, *The Autopoiesis of Architecture*, Jon Wiley & Sons Ltd., 2011

⁵ Peter Zumthor, *Thinking Architecture*, 3rd Edition, Birkhäuser, 2010

as art in metaverse is. And beyond this, what architecture as art in metaverse can and should provide.

2. Approach by definition

An academic way of understanding and finding conclusions can be reached by defining the relevant subjects of interest, in order to present the common and differing aspects and to clarify the understanding and meaning of a defined subject. We need to ask ourselves what our perception of art is to find out whether we conceive architecture as art, and under which circumstances. This may lead to the understanding that the question is more or less of relevance. However, the implementation of the defined subjects into a new and quite unknown world, which metaverse is, again needs boundaries and definition. This is why starting with definitions seems the right approach to learn and understand how far we can get with our perception of architecture as art in metaverse. Is architecture art? And whether or not, what is the scope of architecture in metaverse.

2.1. Definition of art

There are so many definitions and explanations of art. And none of them was generally sufficient to become the one and only explanation that can be accepted as common perception of art. Maybe this is the miracle and glam of art, that it is as wide as fantasy can reach and as flexible as human thoughts can be. Some definitions worth mentioning go back to the great philosophers such as Plato, and later Kant and Hegel⁶. Probably each person of relevance in history had an opinion on art and maybe even a definition.

⁶*Plato*: In the Republic, Plato says that art imitates the objects and events of ordinary life. In other words, a work of art is a copy of a copy of a Form. It is even more of an illusion than is ordinary experience. On this theory, works of art are at best entertainment, and at worst a dangerous delusion. (www.rowan.edu).

Hegel: The principal aim of art is not, therefore, to imitate nature, to decorate our surroundings, to prompt us to engage in moral or political action, or to shock us out of our complacency. It is to allow us to contemplate and enjoy created images of our own spiritual freedom—images that are beautiful precisely *because* they give expression to our freedom. Art's purpose, in other words, is to enable us to bring to mind the truth about ourselves, and so to become aware of who we truly are. Art is there not just for art's sake, but for beauty's sake, that is, for the sake of a distinctively sensuous form of human self-

Following a famous citation by Pablo Picasso that “art is the elimination of the unnecessary” it seems acceptable to choose one particular definition of art that found a large acceptance in academia and is wide enough to be used as parameter for the distinction of objects as work of art. It is the definition by Susanne K. Langer⁷, a renown philosopher of the last century, that reads:

“Art is the creation of forms symbolic to human feeling.”⁸

Langer concludes in her studies that the symbol is the object that derives from the fusion of signification and sensibility. Culture in general refers to patterns that have symbolic functions and can be understood as a categorization of reality by human mind. Work of art simply adapts and implements symbols which are the concept of understanding creativity.

Langer refers to Cassirer, who defines symbols as follows:

*“Man lives in a symbolic universe. Language, myth, art and religion are parts of this universe. (...) Instead of dealing with the things themselves man is in a sense constantly conversing with himself. He has so enveloped himself in linguistic forms, in artistic images, in mythical symbols or religious rites that he cannot see or know anything except by the interposition of this artificial medium.”*⁹

expression and self-understanding. (Stanford Encyclopedia of Philosophy, Hegel's Aesthetics, 2020, www.plato.stanford.edu).

Kant: Kant has a definition of art, and of fine art; the latter, which Kant calls the art of genius, is “a kind of representation that is purposive in itself and, though without an end, nevertheless promotes the cultivation of the mental powers for sociable communication” (Kant, *Critique of the Power of Judgment*, Guyer translation, section 44, 46). (Stanford Encyclopedia of Philosophy, The Definition of Art, 2018, www.plato.stanford.edu).

⁷ Susanne Katherina Langer (1895 –1985) was an American philosopher, writer, and educator and was well known for her theories on the influences of art on the mind. She was one of the first women in American history to achieve an academic career in philosophy and the first woman to be popularly and professionally recognized as an American philosopher. Langer is best known for her 1942 book Philosophy in a New Key which was followed by a sequel *Feeling and Form: A Theory of Art* in 1953.

⁸ Susan K. Langer, *Feeling and Form, a Theory of Art developed from Philosophy in New Key*, London/Oxford,: Routledge & Kegan Paul, 1953, p. 40

⁹ Ernst Cassirer, *An Essay on Man, An Introduction to a Philosophy of Human Culture*, New Haven, Yale University Press, 1944

“Signals and symbols belong to two different universes of discourses: a signal is a part of the physical world of being, and a symbol is a part of the human world of meaning.”¹⁰

The sign which simply indicates an expected rational behavior differs from the symbol as far as a conception is added to the purely physical world. A thought, an emotion or intuition is added to the mechanical perception of a statute and a reflexion, a feeling or a context appear to the individual based on personal and maybe even archaic memorized impressions.

The word “Sinnbild” does refer to this explanation of art. “Sinn” stands for sense as purpose and sense as the five physical senses of the human, whereas “Bild” refers to the simple form of pictorial art such as drawings, paintings and photographs, however two-dimensional expressions in the form of a picture. Art can therefore be understood as “Sinnbild” of the reality we perceive.

Art as a creation of forms symbolic of human feelings is a valid definition when it comes to utilitarian objects that are perceived as work of art. The urinal by Marcel Duchamp¹¹ is a wonderful example of a daily object that was simply exhibited without any indication on the meaning or sense but was perceived as art due to the fact that the artist chose the object and presented it as art. Such conceptual art only functions if the form, and the form giving by choosing the object, perpetuates an emotion whether explainable or not. To declare conceptual art and ready-mades as art, Langer’s definition as well applies successfully.

However, there are counter tendencies explaining that art needs to be understood in a certain period and theory. This leads to concepts which seem to be useless to the understanding of art. Yes, there are concepts and even many different ones:

¹⁰ Ernst Cassirer, *An Essay on Man*, 51

¹¹ Marcel Duchamp (1887 – 1968) was a French-American painter, sculptor, chess player, and writer whose work is associated with Cubism, Dada, and conceptual art.

*“Danto argues that some object is a work of art only when the object is viewed under some socio-historically embedded art theory – or an ‘artworld’. Moreover, the identity of works, their meaning, and whatever artistic and aesthetic properties they might have also depend on their being viewed under some art theory. Danto’s argument may seem to demand that we cannot eliminate the concept art as certain ways of valuing an object must surely depend on a theory of art.”*¹²

But they are not mandatory to the understanding of a work of art as such:

*“We examine one recent attempt, which holds that the correct account of art must recognize the plurality of concepts of art. However, we criticize this account of concept pluralism as being unable to offer an explanation of why some concept is an art concept. Instead, many of the disagreements over the definition of art could be reconciled by recognizing that works of art can be valued in a plurality of ways. By recognizing a plurality of values for art, we claim further that the definition of art becomes a non-issue.»*¹³

Whether we completely eliminate the definition of art due to the plurality of concepts or if we stick to the understanding that certain form nourishes certain feelings, does in the end effect lead to the same understanding that art needs to be felt more than understood and that an object of use can be as much art as a completely useless work in the sense of applicability.

Where does that lead us when it comes to architecture as art.

¹² Bartel Christopher and Jack M. C. Kwong. ‘Pluralism, Eliminativism, and the Definition of Art.’ *Estetika: The European Journal of Aesthetics* LVIII/XIV, no. 2 (2021): pp. 100–113., citation of Arthur Danto, ‘The Artworld’, *Journal of Philosophy* 61 (1964): 571–84, and *Transfiguration of the Commonplace* (Cambridge, MA: Harvard University Press, 1981). Reference to Arthur Danto, “The Artworld”, *Journal of Philosophy* 61

¹³ *ibid.*

2.2. Definition of architecture as art

The definition of architecture is as philosophic as the question on what art is. As much do the answers divert and as much not one definite answer can be found. We again strive through different perceptions without claiming truth or absolute validity for one but intend to open thoughts and possible ideas on a definition that finally leads to understand the concept of architecture as (a form of) art.

Google dictionary¹⁴ gives the following two definitions for architecture:

1. The art or practice of designing and constructing buildings.
2. The complex or carefully designed structures of something.

Wikipedia¹⁵ similarly cites:

“Architecture (..) is both the process and the product of planning, designing, and constructing buildings or other structures. Architectural works, in the material form of building, are often perceived as cultural symbols and as works of art.”

And further:

“Historical civilizations are often identified with their surviving architectural achievements. The practice (..) has been used as a way of expressing culture (..). For this reason, architecture is considered to be a form of art.”

“Architecture is a passion, a vocation, a calling as well as a science and a business. It has been described as a social art and also an artful science. Architecture must be of the highest quality of design. Architecture provides, in the words of Marcus Vitruvius, the great Roman architect and historian, “firmness, commodity and delight”. ”¹⁶

¹⁴ <https://search.yahoo.com/search?ei=utf-8&fr=aaplw&p=art+definition>

¹⁵ <https://en.wikipedia.org/wiki/Art>

¹⁶ https://medium.com/@AAA_Publication/what-is-architecture-1b52f5339c2a

Firmness understood as structural integrity, commodity as functionality and delight as aesthetically pleasing.

Architecture as a form of art, for our considerations shall be reduced to the construction of building architecture, excluding architecture as a structure, such as software or similar systems.

If we go back to the here chosen definition of art that we want to challenge, “*art is the creation of forms symbolic of human feeling*” we automatically direct our attention to the word “form” when it comes to architecture. Architecture as form giving expression, by definition form captured work, is per se the creation of forms. Form as the visible shape of something, the appearance or manifestation, is strictly bound to constructions which all architectural works are. We cannot think of architectural work that is not manifested as a construction due to the fact that it needs to be at least visually perceptible, although not necessarily tangible, which will be further discussed when coming to architecture in metaverse. So, form as a visible manifestation of construction is key element of architecture. Whether the form now is symbolic to human feeling and therefor qualifies as art is the question that needs to be evaluated.

«Form follows function is a principle associated with modern architecture and industrial design in the 20th century. The principle is that the shape of a building or object should be primarily based upon its intended function or purpose.

Architecture is not merely a slavery to the past art, not is it blind originality. It has to be a perfect blend usability, beauty and economy. Architecture has always been the result of the delicate balance between art and science... but it has been more of an Art than science. An Architect is an artist who sets out to remodel the world to make is more perfect for human habitation...

The personality of an architect is reflected through his creations. We can gauge his temperament by looking at the way the structure is designed, both internally as well as externally. An architect takes care of human

need, interests, sentiments & values of his clients while designing the structures...»¹⁷

Susanne Langer, whoms definition of art is referred to, describes the particularity of visual forms as follows:

“Visual forms – lines, colors, proportions, etc. – are just as capable of articulation, i.e. of complex combination, as words. But the laws that govern this sort of articulation are altogether different from the laws of syntax that govern language. The most radical difference is that visual forms are not discursive. They do not present their constituents successively, but simultaneously, so the relations determining a visual structure are grasped in one act of vision.”¹⁸

The act of vision is the moment where the spectator perceives the allegation to human feelings that the artist creates. Renown architects try to embed exactly this sensitivity into their buildings. Peter Zumthor describes his approach to architecture in his outstanding work “Thinking Architecture”¹⁹. He starts with the sensations he lived as a child regarding architectural forms that he memorizes and tries to remember in the embedded architectural situation:

“I try to recollect what the remembered architectural situation was really like, what it had meant to me at the time, and I try to think how it could help me now to revive that vibrant atmosphere pervaded by the simple presence of things, in which everything had its own specific place and form. And although I cannot trace any special forms, there is a hint of fullness and of richness which makes me think: this I have seen before. Yet, at the same time, I know that it is all new and different, and that

¹⁷ www.architecture-student.com

¹⁸ Susanne Langer, *Philosophy in a New Key. A Study in the Symbolism of Reason, Rite, and Art.* Cambridge (Mass.), Harvard University Press, 1942

¹⁹ Peter Zumthor, *Thinking Architecture*, Birkhäuser, Basel Boston Berlin, 2010

there is no direct refence to a former work of architecture which might divulge the secret of the memory-laden mood.”²⁰

The sensation that made Peter Zumthor experience architecture was a memory that had at the time evoked a feeling, probably positive, as he searches to somehow recreate this emotion in his creative process. The question arises where the positivity comes from and here again one is tented to refer to the understanding of archaic structures in our mindset that lead to handed down emotional experiences that cannot be found in our own lived past²¹.

So, although form follows function and the language of architecture as a visual perception is limited to an immediate approach, evolvment by discourse, form intends to be more than just deducted from function.

What is our understanding of architecture if we reduce it to a very simple form of shelter, maybe transposed by wood as the only disposable material. We look at a simple wooden hut, for example as presented at Art Basel 2021 at the entrance to Liste art fair. Such a hut has made it to the world’s most famous art fair. We shall presume that it is art because of the exhibition site already. But if we would see the same hut somewhere in wilderness it would be a utilitarian object, a shelter for the people living in the jungle. Would we then suggest this being art? Probably not. That leads us to rethink the concept of conceptual art and understand that architecture always, and by definition, produces objects that are utile because architecture per se creates housing structures that are defined by shelter and safety aspects. The other way round, architecture demarcates from plastic arts by the *use* as a building. If the creation does not qualify as building, defined as structure with a roof and walls, it is a sculpture.

So does the building, as the useful structure that architecture produces, qualify as art? The answer lies in the common wisdom of “it depends”. It depends on the intention of the artist if we follow the rules of conceptual art, it depends on

²⁰ *ibid.*

²¹ Remarkable that C.G. Jung, one of the great researchers on archaism, was very much involved in the building of his home on Seestrasse in Küsnacht Zurich: “The house of Carl Gustav Jung is without a doubt the physical expression of a great mind.” *Architecture of the Soul: Inner & Outer Structures of C.G. Jung*, Andreas Jung, 2011

the perception of the viewer and there on the individual understanding and taste. And again, it is meant to trigger a feeling if we stick to the chosen definition of art. Form in its perception, as Zumthor explains, refers to memory, whether personal or archaic, that resurrects certain emotions. This resurrection or creation of a certain condition one can live, is the particular expression of architecture. This creation therefore definitely qualifies as art because it goes beyond housing as it includes the sensitivity to make a human feeling perceptible by the viewer and the user of the dedicated form.

However, one can conclude that the definition of architecture as art can be considered of neglectable relevance if we follow the outcome of the discussion on pluralism of art definitions²².

We can define what we believe the add-ons to a simple building shall be to make it art but then again this only seems useful when it comes to concluding as necessity for such in order to improve a development. In other words, we shall look at metaverse and then define what architecture's scope is meant to be in virtuality to then conclude if the criteria of architecture as art applies.

2.3. Metaverse

Although there is no officially recognized single definition of the word metaverse all definitions go back to the invention of the word with Neal Stephenson's science-fiction novel "Snow Crash" in 1992. The metaverse in the novel is a parallel virtual world where avatars live through virtual reality equipment.

Today's common understanding of metaverse is a computer-generated world with a consistent value system and an independent economic system linked to the physical world²³. It is also a universal virtual world focusing on social interaction, which connects multiple 3D virtual environments via the Internet²⁴.

²² See p. 9 and references.

²³ Yuntao Wang et al., A Survey on Metaverse: Fundamentals, Security and Privacy, Cornell University 05-03-22

²⁴ Ruizhi Cheng et al., Will Metaverse be NextG Internet?, Cornell University 30-01-22

And: “a metaverse is a network of 3D virtual worlds focused on social connection.”²⁵

Metaverses that exist and are known to a larger number of users are computer games such as Decentraland, Sandbox, Fortnite or Second Life. The avatars that you can “play” in this virtual reality have options and abilities according to the game creators.

“The metaverse integrates a variety of emerging technologies. In particular, digital twin produces a mirror image of the real world, VR and augmented reality (AR) provide immersive 3D experience, 5G and beyond offers ultra-high reliable and ultra-low latency connections for massive metaverse devices, wearable sensors and brain-computer interface (BCI) enable user/avatar interaction in the metaverse, artificial intelligence (AI) enables the large-scale metaverse creation and rendering, and blockchain and non-fungible token (NFT) play an important role in determining authentic rights for metaverse assets.”²⁶

The development of the metaverse goes in phases and can be explained as follows²⁷:

- *Phase 1*: There is a real world and a virtual world which have no overlaps, but virtuality is a twin of real life. All virtuality is an imitation of the real worlds. One perceives two parallel spaces. Academia talks of *digital twins*. A great example is “Omniverse” a fully functional digital twin of a BMW automobile factory that was used to increase productivity in the real factory.
- *Phase 2*: Physical world and virtual world partially overlap. *Digital natives* can present innovations and creations that only exist in the virtual world through their avatars. The virtual world can impact real life and create more intersections between the two spaces. Valid example for this

²⁵

<https://en.wikipedia.org/wiki/Metaverse#:~:text=A%20metaverse%20is%20a%20network%20of%203D%20virtual,the%20use%20of%20virtual%20and%20augmented%20reality%20headsets.>

²⁶ Yuntao Wang et al., A Survey on Metaverse: Fundamentals, Security and Privacy, Cornell University 05-03-22

²⁷ *ibid.*

overlap is the use of a digital marketplace or a digital communication system such as Microsoft Teams.

- *Phase 3*: So-called *surreality* appears when virtual and real world become congruent. Reality gets assimilated, with the plus of seizing more lives and scenes than in real life. This will happen when we start to effectively live in the extended reality longer and more intense than in our physical surrounding.

Metaverse however melts physical, human and digital world presuming the following characteristics that are decisive for the use and sense of metaverse²⁸:

- Metaverse shall make users live *immersive realism*, which means they shall feel the world they immerse into also psychologically and emotionally.
- Limitation of time and space do not exist (so called *hyper spatiotemporality*).
- Economy with value system and independence of such grants *sustainability* by creating metaverse that is not controlled by powerful actors, but functions on a decentralized architecture.
- Further metaverse needs to become *interoperable*, which is actually the most challenging step builders currently undergo besides the necessary accessibility of metaverse by common devices such as mobile phones.
- *Scalability* can only be reached if the number of participants and the level of complexity remain sufficient.
- The diversity of human psychology needs to be transferred and grant *heterogeneity* of metaverse.
- *Security, privacy* and *legal* issues need to be addressed.

If one follows big players such as Apple and Microsoft their understanding of the use of metaverse is quite simple: the purpose to use virtual space is to try out different ideas and projects with less cost impact and the goal to improve productivity in the real world. The production section of the market obviously understands metaverse as a digital twin where one tries out virtually what can

²⁸ *ibid.*

be implemented in reality, without losing cost and time as in real life. Meta, and other players in the gaming, socializing and leisure area, use metaverse as digital natives implementing direct use in virtuality and at this stage only very futuristic entrepreneurs such as metaverse creators and developers believe in surreality.

For the actual status in 2022 we can however summarize that without specific hardware devices such as VR headsets (or even sensor enabled suits which are still in preliminary development phase), the immersion to metaverse by interactive use is very limited and therefore applications are quite simple and reduced to two senses: seeing and hearing. Consumers cannot smell, taste or touch in common metaverse applications, which is easily forgotten due to the presumption we get from science fiction movies etc. Fact is, that metaverse is about to evolve at a very rapid pace but still is limited to the level of computer games.

3. Approach by actual status in metaverse

Overviewing the implementation of art in metaverse first we continue our research on architecture in metaverse and then conclude whether architecture in metaverse can be seen as art and what the outcome of this finding may be.

3.1. Art in virtuality

To make art perceivable in metaverse it is mandatory to have art on data whether the original is data based or not. The common way to share art in virtual world has become by NFT. Of course, simple projection of pictures of art or videos of such is possible as unprotected data but does not make sense when it comes to trading the artwork.

Since 2017, when NFTs started to spread, the art market took advantage of this data storage system. Rumor spread, that through NFTs one could protect a work of art, guarantee ownership and prevent unlawful copyright. That these

options exist with the minting of NFTs is indisputable, but as well given is, that the underlying smart contract has to regulate all the mentioned details for these to be binding²⁹.

However, the art market accepted NFTs in an impressive way³⁰ and with the increasing interest of crypto-rich, young collectors, even established players such as Sotheby's and Christie's implemented NFTs to their offers. The art market simply had to open up to new marketplaces, such as opensea.com and more art driven ones as SuperRare or similar. These new marketplaces intend to be transparent, reliable less snobby and tent to democracticise the art market, understood as making it reachable for everybody.

The following key figures give an impression of the value of the NFT market³¹:

- The complete value of NFT sales in 2020 was \$250 million.
- The first NFT was created in 2014.
- More than 50% of NFT sales are less than \$200.
- 250,000 people trade NFTs every month on OpenSea.
- CryptoPunk NFT sold for \$532 million in 2021³²
- The most expensive NFT ever sold is "The Merge", sold for \$91.8 million. Nearly 30'000 buyers participated with small size tokens.
- Beeple who sold his NFT "The first 5000 days" for nearly \$70 million with Christie's now sold his first physical artwork for \$28.9 million at Christie's.

Further we can distinguish sections of art that are available as NFTs and get traded on marketplaces or in auction houses:

²⁹ We simply omit the question of enforceability of the stated contractual rights due to the unsolved question on applicable law and jurisdiction.

³⁰ Probably also due to the pandemic driven focus on the Internet commerce.

³¹ https://assets.ey.com/content/dam/ey-sites/ey-com/en_ch/topics/blockchain/ey-nets-in-the-spotlight-1-0.pdf

³² So called «wash trade» was suspected which is a market manipulation that does not include a real sale.

a) Fine art

Fine art is restricted, for the purpose of this distinction, to visual arts such as paintings, photography and sculpture. Fine art works can be scanned or otherwise captured as data of which NFT can be minted³³. NFTs need to be connected to a virtual wallet from where they can be transferred to another wallet. NFTs are presented and sold on marketplaces, whether by fixed price, direct offer or bidding auction.

For fine art the data showing the piece of art can be the sole content of the NFT. The buyer then simply acquires a picture of the original artwork. What is more interesting is the combination of the sale of NFT together with the original of the artwork. This implements that you buy an NFT with the picture of the fine art plus the original, which is stated in the underlying smart contract³⁴ explicitly stating that the original does belong to the owner of the NFT. That is a declaration of ownership right, as valid as a written contract itself. The only difference to the written contract is, that transfer of ownership can be done by transfer of NFT, so even without revealing identity of the parties. No further sale contract with the second buyer is necessary. However, the connection between the ownership as a right and the object itself is not solved by minting a NFT. There must be an attached wallet number for example on the backside of the original artwork that may sufficiently proof that the particular piece of art is meant, which is quite easy to manipulate.

Selling fine art by NFT still brings many uncertainties on transfer of ownership and provenance of work and therefore does not seem to be the upcoming market invention, at least not at this stage.

In Sotheby's auction "Natively Digital" in June 2021 not one fine artwork was presented. The NFTs can all be considered digital art. Of the overall 147 NFTs

³³ To mint is the commonly used verb that explains the production of an NFT by locking a digital artwork on the blockchain by a public ledger that gets stored in a decentralized database.

³⁴ A smart contract is a digital contract where terms of agreement between users is set in code on decentralized and distributed blockchain networks. It can be programmed to self-execute when a set of predefined conditions are fulfilled.

at Sotheby's many are watch designs (Gérald Genta) that are accompanied by NFT, one is a worn T-Shirt by late football star Kobe Bryant and there is even a NFT with AI data Sculpture³⁵. The source code of the world wide web was sold as NFT. Even one pair of jewel earrings was sold with NFT certificate of authenticity. A total of 6 prints of crypto punk NFTs appear under NFT section to complete the rare combination of NFT with physical work.

Christie's is far further with their NFT sale and even has a section "Christie's encrypted". Their range of NFT covers digital art, post-war and contemporary art, 21st Century and they even launched an Art and Tech Summit. Anything can be NFT-ed with Christie's it seems.

b) Digital art

This art form uses digital technology to create the artwork or to present the art. It belongs to the section of new media art. Digital art is practically contemporary art that uses methods of mass production or digital media³⁶. The constraints of digital art, multimedia design and graphic design are floating. Digital art that is purely computer-generated labels as fractals or algorithmic art.

The digital artwork can be itself an NFT or can be associated to an NFT. Due to the limitation of data size in NFT some digital art needs to refer to bigger sets of data in the NFT to allow full perception of the artwork.

Digital art is the native form of NFT art, but not the sole one. It is expected that digital art will live a hype and production increases with the growing interest in NFT.

³⁵ Machine Hallucination: Synthetic Mars Terrain by Refik Anadol

³⁶ https://en.wikipedia.org/wiki/Digital_art

c) Collectibles

This NFT specific works originally derive from the playing card collections. The same collecting system as with playing card or for example Pokemon cards applies to collectibles. The probably most famous series of collectibles is CryptoPunk by Larva Lab. They are 10'000 uniquely generated characters, of which none is the same. Ever since they were sold out the secondary market flourishes as the number of sales in 12 months nearly reached 10'000 with a total value of sales in exemplary 4 weeks rose up to over 80m USD.

The "system" of collectibles is upcoming and interesting to follow as the price of the work is the only measurement one can have on the value. Statistics show how rarity and scarcity influence sales in this market. But one needs to question whether these works are meant to be understood as art. Collectibles often come with incentives such as club membership, events or even investment opportunities. Common understanding of virtual art however seems to include collectibles and we shall leave it to further discussion what the overall sense and meaning of collectibles might be.

3.2. Architecture as art in metaverse

Starting from the short overview on the types of art we find as NFTs and therefor perceivable in metaverse, the question arises if and how architecture can be art, preferably protected by NFT, that can be traded in the art market. Architecture in metaverse can be understood as two different things:

- Architectural visuals such as renderings, plans, models, that are art.
- Buildings in metaverse that qualify as architectural art.³⁷

There are architectural drawings, renderings, pictures and of course 3D models, videos and even plans that can qualify as art. On the main marketplaces for NFT one does not find a specific section for architecture, but some architectural

³⁷ Here the same criteria may apply for the definition as art as in real life. Distinction to simple housing.

works have been minted and traded for example on Opensea marketplace. For each the question arises whether they can be classified as architecture or architectural work and secondly whether the work is art or graphics or nothing of each. The mixture on the market is huge and confusing.

Many of the architectural works refer to land plots in the metaverse and marketplaces refer to “virtual worlds”. Virtual real estate is presented under this category as well as simple plots. The houses look more or less like the ones you find in real life. They have a swimming pool and often cubistic simplified style. As metaverses are built as copies of real life, presuming there is size and gravity, even selectable climate and lightning conditions, the architecture of course follows real life models as well. What a pity. Even real-life real estate starts to be sold as NFTs. Such works simply enlarge the real estate market and try to ease tradability but have nothing to do with art or architecture as art.

Furthermore, architecture in extended reality needs to apply to the given circumstances, such as low qualities of visual perception if the goal is to reach a large audience. The technical applications are limited by the devices of the users and nevertheless the interest, expression and sense that the client or owner of the building wants to perceive is what needs to be met with the translation by the architect into a room and space creation. This fundamental understanding of the circumstances are what makes the work of an architect become art beyond craft. And for this ability there is need and room just as much in virtual life as in real space.

4. Conclusion

If we think about architecture as art in metaverse we can consider a much wider range of possibilities. Metaverse is not bound by the settings of real life. Actually, there is no size, unless self-defined, there is no gravity, no climate, no setting or landscape in which to fit, nothing. The only boundary is set by the fact that human should be able to profit from the metaverse they login to which implicates a certain orientation in space and time, however negotiable.

Architecture as a form of art can touch the viewer by many sensations and through different sense is far more invasive and powerful on humans than for example a canvas painting can be. Architecture can be seen, touched, sometimes even smelled (according to the material chosen to build), and heard (think about echoes in large halls). All these senses can be served and used by architecture in real life. And in virtual life the five senses get reduced. In metaverse a building can be seen, sound effects can be implemented, and that is quite it.

Due to this for now still existing limitation of possibilities in metaverse, architecture should dare to go beyond where possible. It is limited to two senses, yes, but it can profit from the liberation of real-life boundaries. That is when architectural work in metaverse comes out of a discourse on needs and living options. That is when an architect becomes an artist who creates a new world not only by visual effects but by thinking what the expression shall be and by translating senses and sensitivity into creation. The understanding of a building may undergo changes in metaverse but that is acceptable, if not even wished for to happen. It will lead to redefinition of architecture and emphasize the need of thinking and creativity in metaverse. Creativity that leads to forms symbolic of human feeling. Such architecture is missing. And there lays the goal of creation beyond game design and sense deliberate structures that aim to please tech affine players and do not touch base with the art in architecture which reflects the inhabitants needs and expressions.

Whether architecture is understood as art or utility, or art although being utile, does not really matter. By transcending into an overlapping space of virtual and physical reality the need for thoughtful creation is given. If art is said to be the creation of form symbolic of human feeling, then it is by this art that the relevant component of humanity can be implemented in the ternary *physical, human* and *digital* that the construction of metaverse blends.

III. Metaverse

1. Introduction

Virtual reality is about to be built. And what exists gets improved and extended in an enormous velocity. Metaverse, Web3, decentralization, blockchain and NFT have become nearly common, daily use language. Understanding seems more complicated. But general consensus leads to the assumption that there is no way out: the future seems to be blockchain based and NFTs, used in metaverses, will simplify our daily life and create a substantial bridge between our IRL reality and VR³⁸.

The first metaverses, that we define as such, are computer games, and somehow all metaverses still are computer games, in one way or the other. The users can, by definition, enter a virtual surrounding, be a specific personality (avatar) and *interact* with others. This is what it is all about: blockchain-based interaction. This is the game changer between Web2 and Web3³⁹.

The question *who builds* a metaverse and *who should be building* it, and what implications need to be considered for a metaverse to be useful, and therethrough define the relevant competences of creators, is the field of interest for this work. To understand the necessities, we need to take a broad overview on existing metaverses and existing architecture in this field; a snapshot that will be outdated tomorrow, considering the velocity of development. The overview will be followed by the presentation of three architectural projects for Salon d'Art

³⁸ IRL stands for "in real life" and defines the tangible reality we presume living in without any access tools except our bodies, whereas VR stands for "virtual reality" covering a designed environment that can be perceived by use of hardware. The bridge between IRL and VR includes AR, augmented reality, which implements not only visual but also haptic, auditory and olfactory perception.

³⁹ Where fear of loss of social skills due to excessive virtual activities are a common concern, metaverses are defined by the exact opposite: one can interact with peers and find groups of similar interest to join and exchange ideas without even moving from our desktop. There is no physical interaction, yes, but there is interaction and that is interesting to keep in mind, when we consider a perfect metaverse which is the goal to build by any architect involved in this market field.

in extended reality by architecture students, with obviously inter-disciplinary skills, filed in a competition. These oeuvres represent the future vision of architecture of how architecture can work in the metaverse. We shall then conclude with a visionary outlook by Kerstin Kim⁴⁰ but will remain with a bundle of questions that need to be taken further in order to define the work of the creators of virtuality.

Although metaverse bases on blockchain technology, enabling the implementation of certain tools such as visuals, texts and interactive options, the focus will not be on this IT infrastructure or IT architecture. We however need to consider that there are different blockchain based technologies that enable the creation of metaverses and that they are, for the time being, *not interoperable*, which causes a huge problem when it comes to growing beyond the limited space of each secluded environment.

Our field of research focuses on architecture, understood as creation of buildings, using the existing tools, with the scope of creating space and context for specific social need and interaction. Whether such separation of purely technological and creativity driven visual architecture makes sense or not, can be discussed, as in virtual surroundings the technical skills go up to coding certain implementations, tailor made, and therefore melt boundaries between IT and architectural designing. This is where interdisciplinary solutions become mandatory, and where sharing competences and combining expertise lead to new ways of creativity. We leave this to further research projects and focus on the necessity (or at least advantage) of architectural knowhow to build metaverses.

⁴⁰ Kerstin Kim is a visual artist, based in Toronto, founder of Techism, who sold her project The Mars House this year as NFT for 500k USD on SuperRare.

2. Actual status

NFTs, metaverse, Web3 and any blockchain technology-based invention are super young to history. It is a wildly growing, hard to oversee market, that is exploding and not that easy to understand. It does make sense to start with some definitions, because these have changed as well throughout the (short) time, and then present some examples of architecture in metaverses and combine these with theories and thoughts on boundary breaking. The idea is to give the reader a dive-in to this huge world by highlighting very few, but exemplary snapshots.

2.1. Definition and understanding of metaverse

According to meta, the Mark Zuckerberg company, the metaverse⁴¹ is “the next evolution in social connection and the successor to the mobile internet.”

The metaverse refers to an idea of a virtual universe, first brought up in the novel *Snow Crash* by Neil Stephenson in 1992. Users shall be able to access virtual worlds by augmented reality and other technologies.

Another common definition reads as follows:

“The metaverse is a large, open, shared, and persistent 3D virtual world where users can explore and interact with each other through their digital avatars. The metaverse also allows the scope for performing many complex interactions.”⁴²

Relevant to the understanding of metaverses is the fact that these shall be built in a so called *Web3* environment. *Web3* simply means that the complete structure is blockchain-based and therefore decentralized, whereas *Web2* (which is the Internet as we use it now) is a centralized system, where data

⁴¹ Find Wikipedia definition here: «The term "metaverse" originated in the 1992 science fiction novel *Snow Crash*, as a portmanteau of "meta" and "universe". Metaverse development is often linked to advancing virtual reality technology due to increasing demands for immersion. Recent interest in metaverse development is influenced by *Web3*, a concept for a decentralized iteration of the internet. *Web3* and *The Metaverse* have been used as buzzwords to exaggerate development progress of various related technologies and projects for public relations purposes. Information privacy, user addiction, and user safety are concerns within the metaverse, stemming from challenges facing the social media and video game industries as a whole.»

⁴²Metaverse Technology – A Definitive Guide, 101 Blockchains, James Howell, 02.02.2022, <https://101blockchains.com/metaverse-technology/>

belongs to a small group of companies, the so-called Big Tech. Some relevant players dare to define Web3 as simple buzzword or marketing term, such as Elon Musk (SpaceX, Tesla) and Jack Dorsey (former CEO Twitter). Fact is that the definition is ahead of the constructed reality and must be understood as *vision*.

Helpful is a short overview of existing metaverses and types of metaverses.

We shall distinct metaverses from multiverses, such as Oncyber⁴³. Multiverses (also mentioned as microverses) create specific single smaller-scale spaces that not necessarily connect to each other. The advantage is, that providers of these smaller spaces can technically improve with every new single space they create, whereas larger scaled metaverses are not as flexible to pivot due to economic impact of such changes.

True metaverses, if that is an adequate term, usually derive from computer gaming and still work as such. Examples are Decentraland⁴⁴ and Sandbox⁴⁵ as well as Secondlife, Cryptovoxels and Somnium Space. All metaverses are built as spaces, either cities or islands or any sort of land, that can be divided in plots which can be bought and built upon, usually with prefabricated elements and therefore easy to use. In all metaverses you find designed landscapes that provide orientation and visibility for the other users, which meets one of the main criteria: *interactivity*. Space needs to be created in order to be able to move and to locate yourself, others and the objects of interest in the environment.

Very interesting are museums that are built as separate microverses, as they are interactive and combine NFTs, and therefore blockchain technology, to give information or even sell objects. On Somnium Space for example we find the Museum of Crypto Art⁴⁶, which provides parcels to show NFTs in digital architecture, that is on a very high quality of renderings. You get a look-alike

⁴³ www.oncyber.com

⁴⁴ www.decentraland.org

⁴⁵ www.register.sandbox.game

⁴⁶ <https://museumofcryptoart.com/collection/>

avatar, based on a selfie, and walk and teleport through the exhibition. Clicking on the NFTs, you find all information and sometimes a link to the marketplace where the work is exposed.

Another great museum is the Musee Dezentral⁴⁷. Visually not as fancy, but with an interesting approach of minting your own frame and then exhibiting your works in the museum.

Last, we shall take a look at an atypical metaverse that supports a genius idea of having different levels of access. The main landscape is technically on the same quality level as other metaverses, but when you enter the plot of a user, a shop for example, you can access their specific *subverses*. In these subverses the technical options are far better, and architecture gets displayed on a professional level without losing data or loading time. The metaverse is named Pax World⁴⁸, and is planned to go live by end of this year. If their system provides what they promise then this will be a groundbreaking invention that pushes metaverses forward, at least when it comes to visual qualities.

2.2. Architecture in metaverse – a snapshot

As mentioned, all metaverses have a structure, that was built either by game designers, architects or even the users themselves (usually with a toolbox of the provider, such a Minecraft). Per definition all metaverses are full of designed spaces, widely defined as architecture. The following examples were chosen because they are either effectively built by architects or promote such.

The most prominent architect in metaverse is probably *Patrik Schumacher of Zaha Hadid Architects (ZHA)*. He continues underlining the relevance of architects building metaverses, and not video game artists, as they do not have the same education in design. For Schumacher metaverses shall not give the opportunity to alternate reality and escape to an invented life but enhance society and enable improvement in the physical reality. Human interaction,

⁴⁷ <https://musee-dezentral.com/exhibitions>, see also: Art moves to the metaverse, Morning Brew, by Sherry Qin, 16.06.22

⁴⁸ www.pax.world

consisting of knowledge exchange, professional collaboration, cultural communication, art, education, political engagement etc., needs both, a physical and a virtual component. The scope of the virtual “digital twin” is to bring an add-on to IRL interaction. In Schumacher’s world all design is about framing social interactions. He distinguishes in his theory of architecture in metaverse four different project stages:

- the organizational project, overviewing the complete structure
- the phenomenological project, increasing information richness
- the semiological project, enhancing social functionality
- the dramaturgical project, representing interaction design

However, working and building in metaverses, Schumacher strongly believes in the connection between physical and virtual life and even foresees shared entering in virtual worlds on larger panoramic screens in the relevant physical environment such as office spaces. And he deducts:

“It is (...) important to design real and virtual spaces together, as a continuum.”⁴⁹

“Liberland” is probably the most famous metaverse *and* real-life project, where ZHA are about to build on a real island (by the way a newborn state with a decentralize democratic system, that shall work similar to a DAO structure on blockchain) and create a virtual *twin* island as a specific metaverse. The land sale has begun in both “states”, and we are eager to see how the combination of real life with virtual can enhance the quality of work, life and leisure of the inhabitants and of course how the decentralized ecosystem can influence the social structure of a community. The project seems to be one of the most interesting ways to figure out how blockchain technology can impact real life and it will be exciting to see the future developments of this incredible experiment.

Another architecture studio in metaverse, that by brand already presumes architectural works, is *metaverse-architects*⁵⁰. They describe themselves as 3D

⁴⁹ The Metaverse as Opportunity for Architects: An Interview with Patrik Schumacher, ArchDaily, 14.04.22, by Sara Kolata

⁵⁰ www.metaverse-architects.com

modelers and game developers and build on Decentraland, Sandbox and “all Metaverse worlds”. This is quite a challenge, as all metaverses request different data types and sizes to plug and play. With Oncyber for example, only data up to 40MB can be uploaded and the only file type they can read is fbx⁵¹. The examples of buildings realized by metaverse-architects does give the impression of a game environment. One could not imagine such visuals representing a bank or a stock listed company. But tastes are different. If you look at Sotheby’s representation in Decentraland metaverse, you doubt that this is the famous auction houses metaverse gallery, because it reminds you more of a mockup version due to the poor quality of the renderings.

The metaverse-architects do not really position themselves as either game designers or architects but obviously remain very flexible and offer tailor made solutions to their clients. High end architecture however looks way different, and doubt comes up, that this is not their field of activities.

We need to understand however, that no matter how distinguished and modern the visualization of architecture might be as a 3D model, it does lose a lot of quality due to the limitations of the metaverses, which leads us to understand the importance of the quality of metaverses, and combined the marketplaces, where these architectural works are presented and maybe even sold.

Another architectural studio creating for the masses in metaverse is *Space*⁵². They offer prefabricated meeting rooms, that can be rented or purchased and even the option to create individual space. Implementation and access to the works remain on the customer’s side. Their business model covers prefabricated structures and they have increased the quality of the visuals incredibly within the last six month. From a Minecraft style of design, they improved to business level surroundings, where you do appreciate having meetings.

⁵¹ <https://docs.oncyber.io/>

⁵² <https://app.tryspace.com/>

This architecture studio goes beyond simple building and concentrates on applications that come with the space and scalability through collections instead of tailor-made offerings. This approach seems very useful especially because it targets average mid-size businesses and focuses on easy-to-use models.

Overall, we find a huge variety of so-called architects in metaverse and according to the need of the customer, there are many valuable options to get reasonable architecture that can be implemented and used in metaverses. It is important to distinguish where the architecture needs to be implemented, because this decision influences the visual quality of the architectural work. With the choice of the architect the metaverse should be chosen as well. Furthermore, it seems important to distinguish, whether one needs a tailor-made presentation of corporate identity in metaverse or if simple shelf structures will do. A tailor-made metaverse architecture by a competent studio will bring all architectural education and knowhow into the project and therefore combine more than just visuals and applications but considers aspects such as history, storytelling, memories, context, and many more.

2.3. Applicability of architecture theory

We have seen some examples of metaverse architects so far and took a glimpse at metaverses to get a feeling for the designs that are requested in virtuality. The question of why architects should build the metaverse and not (only) designers or game artists, can now be approached by looking into some theoretical aspects that architecture in general works with, to generate principles.

Many of the architectural principles, such as “form follows function” (or later: “form that generates function”) remain untouched, as the real world continues to influence the virtual. The two realms extend into and influence each other⁵³. What becomes irrelevant in virtuality is *size*, *gravity* and *context*, such as nature, environment, and climate in general. These conditions can be defined

⁵³ Architecture, Heritage and the Metaverse, Andrea Moneta, in Traditional Dwellings and Settlements Review, Fall 2020, Vol. 32, No. 1, p. 37-49

by the creators of the metaverse. It's a God like position, nevertheless restricted by the fact that metaverses are still built for humans, and that human *capability of perception* is limited by nature. A fact well understood for example by motion sickness which often results of use of VR glasses.

Most architects in metaverse believe in the sense of creating *digital twins* in extended reality. This means simple copies of real life in metaverse. The extended possibilities of integrated extras one can find in metaverse environment, and which go beyond real-life experience, are the add-on that justifies virtuality. Even considering a completely free of IRL-model, virtual building, there is always one crucial factor that limits the freedom of architecture even in metaverse, and this is *orientation*.

Whether you build a city or a house or even only one space you (as a human being) need to understand where you are in context to your environment (location and self-perception), where you are heading to (mind map), which size things have (measurement) and how you move in the space (gravity rules). This information is mandatory for the so-called *wayfinding*⁵⁴. In virtual cities, where teleportation is a convenient way of moving, roads and plazas become irrelevant for transportation, but they take a different role. They help with orientation, and they become spatial browsing tools. Kevin Lynch, the godfather of the wayfinding theory, defines five main elements that people use to orient themselves in their mind and memory: path, edges, districts, nodes and landmarks. All visible, distinctable and memorizable items that help to find the way. Deriving from the wayfinding theory, *patterns* are what computers generate to systemize structures, and such have been implemented to architecture nearly 50 years ago by Christoph Alexander⁵⁵. The architect Alexander, with his colleagues implemented a systematic to solve cohabitational problems and giving solutions into the hands of everyone. His approach was such, and could be of course now adapted and tested in virtual construction:

⁵⁴ Kevin Lynch, Image of the city, 1960

⁵⁵ Christoph Alexander, A Pattern Language, 1977

“each pattern represents our current best guess as to what arrangement of the physical environment will work to solve the problem presented. The empirical questions center on the problem - does it occur and is it felt in the way we describe it? - and the solution - does the arrangement we propose solve the problem? And the asterisks represent our degree of faith in these hypotheses. But of course, no matter what the asterisks say, the patterns are still hypotheses, all 253 of them - and are, therefore, all tentative, all free to evolve under the impact of new experience and observation.”

It would be more than interesting to see the patterns used in virtual buildings and even more to declare new patterns to virtual building, differing whether they are twin or IRL or absolutely surreal (invented without connection to real life)⁵⁶.

Further difference between a building in real and virtual life is *transformation*. A building IRL can generally not transform, but a virtual one can easily do so. The building can get into a dynamic interaction with the user. Again, orientation and perception are the boundaries to such extravaganza in virtuality. And the transformation should pursue a goal the user aims for.

For the context of a building, we need to differentiate whether it is in a given metaverse, for example an island with a certain neighborhood, or if the context is not defined yet. *Context* can bring in historical references and archetypes, which blend in a collective memory of the past. It is however a decision to take and symbolism that can be used very similar to IRL buildings to create a requested impact on the user, even without given context.

An interesting article in ArchDaily of November 2021, covering architecture in metaverse, ends with the question whether we need to define the new values of architecture in digital age?⁵⁷ This is the accurate question researched in an architectural competition, named “Salon d’Art XR”, where students expressed their idea of building in virtual space and their understanding of values and

⁵⁶ See for distinction between digital twin and surreality: Yuntao Wang et al., A Survey on Metaverse: Fundamentals, Security and Privacy, Cornell University 05-03-22

⁵⁷ Architecting the metaverse, Chloe Sun, ArchDaily, 24.11.2021: “*History is like a mirror that when we look at it we see new reflections each time. “The values of architecture” vary across history. From “Stability, Utility, Beauty” in the Roman time, to the “The seven lamps of architecture (Sacrifice, Truth, Power, Beauty, Life, Obedience, and Memory)” by Ruskin in the 19th century. From Le Corbusier’s “Toward an Architecture” that unfolded the modern architectures in the 20th century to dismiss decor and embrace pure form as the new spirit of the industrial age, to Christopher Alexander’s “Pattern Language” that heavily impacted software engineering... Do we need to define the new values of architecture in this digital age? This is an open question to my dear readers. The better we can define and implement the value of architecture, the better we can architect a great unmaterial metaverse.*”

boundaries. Find three of the seven awarded works hereinafter with a short description of the work and a summary of the architect's ideas, as an inspiration to bring in your own thoughts on architecture in metaverse.

3. Competition Salon d'Art

NFA non fungible architecture⁵⁸, an architectural studio building exclusively in metaverse, launched in March this year an architectural competition with the main question: how and what do you build in metaverse if you were to create a classical Salon d'Art in virtual reality. The competitors had nearly three month time to hand in their suggestions and five awards were given by the jury, consisting of Greg Lynn, architect, Hans Ulrich Obrist, curator and Quayola, artist. From the first seven nominated, three works are presented here, which in the authors understanding, dealt with the questions of breaking boundaries in virtual reality, and exploring to which extend. But first find the description of the task the students were exposed to.

3.1. The task, breaking boundaries

With the rise of extended mediums such as augmented reality, virtual reality and their spatial allocation in virtual worlds, an emerging spatial question arises: *What is the role of architecture and spatial design within these new worlds?* How will they interact and overlap with our existing worlds? What new experiences can architecture cater for if embedded within the virtual? The presence of this emerging spatial domain can no longer rely on dogmas of the 19th and 20th century and the premise and notion of physical boundaries, forms and expressions and ideals of convenience. The digital opens novel possibilities and challenges these spaces and worlds, which need to be explored and designed. Architecture is at the disciplinary forefront to take agency for a meaningful and novel speculation for this emerging challenge. Salon d`Art is a student competition drawing attention to architecture within the digital realm and its conceptual and phenomenal challenges.

The brief of the competition reads as follows:

“The brief is asking for an imaginative speculation for an XR Salon d’Art, nested inside a virtual environment. XR stands here for extended realities and is to be

⁵⁸ NFA non fungible architecture is a Swiss LLC founded by the author in December 2021 with the goal to mint and launch NFTs of architecture works as 3D model. The company had to pivot to tailormade metaverse architecture and implemented NFA Art, a marketplace for NFT editions, as well as NFA Lab, a thinktank on architecture in metaverse.

conceptualized without constraints or spatial boundaries. The project is seeking to investigate new forms of:

- *curatorial strategies*
- *spatial narratives relating to exhibitions and artwork*
- *exhibition for art pieces of 4 artists*
- *navigation and interaction through spaces and around artwork*
- *interiority*
- *materiality, transparency and illumination*
- *socializing and knowledge transfer*
- *visitors experiences*

The Salon d`Art stands in contrast to physical spaces. It has mere limitations and its spatial qualities build on introducing an audience to unprecedented exhibition experiences within a novel spatial environment and worlds. The Salon d`Art XR shall follow these constraints:

- *creative invention and spatial design*
- *the world art at large*
- *different art mediums*
- *the spatial elaboration on the language of 4 particular artist, within an XR setting.*

The Salon d`Art XR shall be following these programmatic constraints:

- *visitors within the space : max 150 **
- *4 areas for four different Artists, with no necessary strict separation, but identity*
- *2 socializing areas with bars and small dancefloor*
- *4 meeting areas for a small group of 4 people*
- *grand entrance and reception*

**no m2 will be provided as size and scale is upon decision and design of the competitors”*

3.2. The outcome, three examples

Among the competitors there were students from all over the world. Universities with a strong interest in digitalization of architecture, such as Die Angewandte in Vienna, AA in London and ETH in Zurich performed extraordinarily well. The three award winners and two nominees were invited to an award ceremony that

took place in real life on 11 June 2022 in Zurich and was enhanced by virtual appearance and nomination of the jurors⁵⁹.

3.2.1. Anthropocene by Megan Riri Moktar, Singapore University of Technology and Design



Megan's work is a video that shows an invented scenery in a designed timeline somewhere at the beginning of earth. It looks very similar to a computer game and the user walks through different settings and experiences. She describes the experience as follows:

"In the following exhibition, viewers are now invited to "walk into" painting holograms that portray various fates of the earth, may it be in the past, or possible futures. Upon "walking into" the paintings, viewers will "enter into" a VR world where they would be "exploring" these alternate worlds, while, in reality they are guided along a path in the physical space. The activity following is a collaborative world building exercise where viewers are invited to come together to a panel, and build a common desired world,

⁵⁹ You can find two movies of the seven best works and the award ceremony on the website of NFA under NFA Lab www.nf-architecture.io. Find these works of the students as well on OpenSea, accessible over the website of NFA under NFA Studio. <https://www.nfa-studio.com/collections/salon-d-art>

based on negotiation, by picking the artistic artifacts that represent certain way of living in a possible future. The sequence of events curated in the space is in increasing degree of immersivity and detachment from the real, then ending off with a sense of responsibility of the viewers and ownership towards their futures.”

The exhibition concludes with the final product, a holographic projection of the desired landscape, which will be archived each time it is being made. These projections are monuments for people to look back and reflect on how their relative past, present and future evolve, and how people’s idea of an ideal environment change along with it.

The interesting part of Megan’s work is, that she sticks to computer gaming style and implements many technicalities that you do not have IRL. The work dives into augmented reality and lives of features that are only virtual. Nevertheless, there is a clear distinction to video games: her project does have a sense and impact on society, the way she perceives the outcome, which is a memory of a designed world that came to live in a cooperation between users, other humans, who all go back in time to the beginnings of earth, to then design their wished-for environment. The idea in its selves bears many philosophical questions, and even as a computer game could serve as experimental hub for research in this field.

Architecture in this work is computer game based, and here, this does make sense. It is a proof, that architecture can decide to be very simple and reminding of a video game design, but the reason why it is so, needs to be thought of, and we presume that this way of thinking, *how a building influences perception of the content*, is, what architects are trained to do.

3.2.2. Perlin Noise by Florian von Planta, Khalil Mdimagh, Felix Moreno,
ETH Zurich and TU Vienna



This building looks like a skyscraper-cake with many different layers and a veil kind of surface. Interesting is the tool the team from ETHZ uses to give orientation and sense of gravity to the user: They use uniquely stilts, and this is how they explain, why:

“The stilts penetrate these spaces and create new configurations in each floor through their angled nature. Rather than serving any actual load bearing function their continuous directions bind the floors together and allow a spatial dialogue in the vertical to take place. The stacking of the floor plates in turn adds to this dialogue: What appears as a convex ceiling in one room turns into a concave floor in the room above and vice versa. To experience such a space is to always get a glimpse of what lies below and above oneself without any direct visual connection, drawing the visitor onwards to explore more floors of the museum. (..) A lift shaped as a stilt connects the ground floor to the very top of the building.”

Apart from the beauty that this building expresses, we consider the way the architects treat the question of orientation in space. They understand, that without a known and recognizable element, such as the stilt, the user cannot find the way and will not understand the exhibition hosted in this museum. Curators work cannot be done properly if the path of the viewer is uncertain, unless this is a curators wish and done on purpose to distract or liberate the viewer. However, in general, curators do want to lead the viewers through their show and in virtuality this can be done very well in a tailor made building, like this competition work shows.

Remarkable in this works is the fact, that the architects also decided on the way of transportation for the users. They can of course scroll through all floors, but there is no teleportation. The idea is to use the stilt that is a lift. In the video this is not presented sufficiently, but following the description, one understands that considering the way of motion in the environment is a huge issue in virtual world, no longer bound to physical constraints. Reducing the options of flying, teleporting und juming, to a “regular” way of moving, by lift, is a clear decision, which takes into consideration, that the viewer can quickly be overloaded by too many motion options, and that reducing the options might help to emphasize the understanding of the building. In this case being a Salon d’Art and not a video game, where you jump and move in unnatural ways, but where a curator and artists want to explain and discuss art by exhibiting it in a certain, specifically created way.

3.2.3. Salon of Relativity by Tala Sawmeh, Velina Iantcheva, Zach Beale, University of Applied Arts Vienna



This work really astonishes the viewer at first sight. It is a clean and neat white exhibition building and when you get closer to a wall you understand that this is the floor of the next room. Gravity gets a new concept. The viewer is at all times stuck to the floors, but the floors can be walls and ceilings, according to the perspective you look at.

The fact that the viewers remain stuck on the ground, no matter where these floors are, gives the user some safety and by seeing many other visitors on each floor, you can deduct the safety that you will not fall if you change floors. Vertical walking, or even upside down walking, becomes feasible and is an addition to real life that you can appreciate, because it does neither scare nor cause nausea.

This is what the team explains:

“Within the field of architecture, topology has been a topic of interest for many projects of the past. However, constrained to the conditions of

physical gravity, geometries of continuity have remained mostly an aesthetic obsession for many architects. The virtual realm, where the limitation of standard gravity is not relevant, offers a new playground for architectural experimentation with topologies of navigable surfaces and the possibility for new museum experiences to emerge.

Employing the mechanics of movement governed by gravity relative to the walking surface, we reimagine the Salon D'Art in the virtual realm by warping the museum organization around a central space and hence, providing two modes of experiencing the artworks - as ambiance formed by the juxtaposition of all pieces within the central space through the careful use of apertures, and as an individual artwork viewed in isolation from the rest of the collection.»

The Vienna team emphasizes that working at an intersection of different areas of expertise made them dive into game design, visual arts and combine these with their architectural skills. Interdisciplinary approaches are exactly what brings these amazing results. However, consideration of how one can best fulfill the clients wishes and needs with a certain building, is an architect's core competence and it can be said that each and every competitor understood the expectations and was able to highlight certain aspects in metaverse that come with architectural thinking.

Solutions seem to be endless, just as they are in real life and it will remain exciting and interesting to see where the career of these young architect students will lead, maybe in metaverse.

4. Conclusion

In March 2022 Krista Kim, a Toronto based contemporary artist, sold the video of a house she created, “The Mars House”, on SuperRare marketplace for 288 Ethereum, which was about 500k USD at the time. This incredible sale generated media attention and the question came up, why would someone pay such an amount for a video of a 3D rendering made with Unreal Engine (which is used for computer games such as Fortnite). The house is not buildable in real life, it is not in a real context (on Mars) and you cannot even use it as a game. You simply sit and admire the video of the flow through the designed space. And it is fantastic!⁶⁰

Krista Kim explained her artwork in many ways and an interview with ArchDaily⁶¹ she brings is down to the point:

«I really wanted to have a connection that's visceral, to digital, because I saw that our relentless distraction in our screens would be causing a lot of disruption in our society, and in fact, our own psychological makeup as individuals. I felt that we needed art and the expression of humanity to be involved at the forefront of technology to make it more humane, to make it more healthy, to pivot toward the well being of our individual mental health, and therefore our society at large.»

Based on this understanding of technology and art, she founded the Techism movement (already in 2014) and reminded creators of all sorts to recognize that digital technology should be a medium to create art, that can be healing and meditative and should be spread around the world. She goes as far as believing that the future of society lies in metaverse and the impact to the real world, taking the example of DAOs, where people gather in metaverse for common interest and take decisions together that influence IRL. And considering that in the future all sorts of interaction will be certified by NFTs, she even sees the option to build individual forcefields that protect users of metaverses by creating

⁶⁰ <https://youtu.be/LbVm4SeCVKU>; note that the video can be shared and seen by everyone because it is minted as an NFT and therefore ownership of it is undisputable.

⁶¹ The Crypto-Future of Architecture: An Interview with Krista Kim, Arch Daily, by Sara Kolata, 30.04.2022

individual rules with algorithms, defining what you want to perceive in virtuality and what not.

This excursion to Kerstin Kim and her Mars House shall remind us, of who kicked off the idea to sell designed space in metaverse, so NFT secured. The huge price that was paid and the attention this simple video generated, inspired architects all over the world to start to think about the meaning of architecture in metaverse. Boundaries between art and architecture were torn down, as much as physical boundaries no longer hold back creativity of architects. This new freedom to create by still using the knowledge, competence, and ethics of an architect, is what presents the challenge in metaverse ecosystems. As Kirsta Kim described so nicely, it is about bringing emotions into technicality, about floating in an artsy world to feel and, it is about creating *forms, symbolic of human feeling*. This is when architecture becomes art.⁶²

The information, projects and visions presented in this work are an overview of this very moment in time, highlighting some interesting aspects, but not more. The discurs between the disciplines, sharing and co-creating knowledge, is what we shall wish to happen, to fertilize thoughtful, responsible, inspiring and enhancing architecture, also in metaverse.

⁶² «Art is the creation of forms symbolic to human feeling.» Susanne K. Langer, *Feeling and Form, a Theory of Art* developed from *Philosophie*, London/Oxford, 1953

IV. NFT

As we have taken different approaches to define the correlation between art/architecture and metaverse/NFTs we found that architecture is mandatory to building a substantial virtual reality and that this leads to the creation of artworks as virtual architecture. Whether the architectural work itself or the herein presented objects⁶³ are implemented into a metaverse this always and mandatory happens by use of an NFT. This chapter focuses on the legal aspects concerning NFTs and wants to create awareness for users for these topics.

1. Definition

NFT, once again, is the abbreviation for nonfungible token. It means that the token is unique and cannot be exchanged by an identical other one. This differs from tokens in cryptocurrencies, which are fungible and can be exchanged without any loss of value, just as coins in physical reality.

A nonfungible token however is unique and not exchangeable. A recent definition reads as follows:

“A cryptographic asset on a blockchain with unique identification codes and metadata that distinguish them from each other.”⁶⁴

A token is a blockchain based ledger that is created in a combinational interaction of different devices. Each ledger is unique and therefore proof of identity is given.

NFTs are built on ERC-721 standard, which makes ETH the underlying cryptocurrency. Following ERC standards have been improving transaction costs.

⁶³ Whether this is art or purely commercial NFTs.

⁶⁴ <https://www.investopedia.com/non-fungible-tokens-nft-5115211>

An NFT gets created in a process called minting. By minting the information and data of the NFT gets encrypted in the blockchain and can incorporate smart contracts that state specific rights. With the minting of a token, such as an NFT, a unique identity gets created, based on the unique blockchain address. The token has an specific owner and ownership information (wallet where the token is on).

2. Use case in art and architecture

Ever since the launch of the first NFT in 2014⁶⁵ nothing much happened until 2017 the usage of ERC-721 standard via Ethereum started to increase interest in minting an NFT. CryptoPunks, CryptoKitties and rare Pepe trading cards were among the first trials on NFT creations. They all included cartoon like renderings one could collect. The online game CryptoKitties sold tradable NFT cats with great success. With the hype of crypto currencies, the NFT market grew to unimaginable USD 250M in 2020. No longer only images, profile pictures or collection cards are minted, anything that could be shown in a picture or video was about to become an NFT. Brands started to sell products as NFTs, sometime underlying the physical object, and sometimes even not⁶⁶.

Apart from the notorious commercial use of NFTs digital art was of course predestinated to showcase through the medium of NFT. NFTs have one terrific plus for digital art: the artist can show the artwork without fear of loss or theft or IPR infringements. The precise definition of digital art and the boundaries to pure commercial artistic expressions has not been defined. However, artist like Beepl, Refik Anadol or Sarah Zucker continue gaining reputation in the art world and beyond for their NFT protected works. The two largest auction houses have set on NFTs a well and did specific NFT auctions. Obviously, there is more to come in that field. The same goes for exhibitions, galleries and even museums that concentrate on showcasing and promoting NFT art.

⁶⁵ “Quantum”, created by Kevin McCoy and Anil Dash, showing a video clip by Jennifer McCoy.

⁶⁶ See Nike sneakers as NFTs only, exemplary for several even high fashion brands:

<https://insidebitcoins.com/news/nike-launches-new-nft-collection-our-force-1-to-celebrate-its-first-50-years>

In architecture the use cases have been described already in details. Since Krista Kim's House on Mars (btw an artist and not an architect by education), many renown architects, such as Rem Koolhaas with OMA, or Patrik Schumacher with ZHA, have entered NFT world and created wonderful digital experiences⁶⁷. The architecture so far represented in NFTs is mostly more on the art side than purely economic although the obvious connection to real estate sales has taken up NFTs as well.

Generally speaking, NFTs are still quite specific and not a common use case for anybody who uses a mobile phone. The next level of use cases and spread of NFTs can probably only be achieved, once the applications are not bound to cryptocurrencies anymore, payment by credit card is possible, and the set up and use of a wallet becomes as easy as loading an App.

2.1. Reputation, Problematics

The bad reputation of NFTs is somehow correlated to the bad reputation of cryptocurrencies. Scammers had huge press although in relation to the relevant transaction figures, the token-based transactions seem safe. The fact that the users remain unidentified, by definition, is cause to the overproportionate attention when it comes to fraudulent transactions.

Initial problems were also the environmental impact caused when minting an NFT, by outstanding use of energy. This however has been decreased by various providers and no longer seems to damage NFT reputation.

The volatility of an investment and the complete unpredictability are further factors that target NFTs reputation. Prices for NFTs have gone through the ceiling and others, just as weird or special or interesting, did simply not sell at all. There is no reliable explanation to the market which makes it all seem more like a gamble than serious business.

⁶⁷ <https://www.archdaily.com/974866/7-stories-about-nfts-entering-the-realm-of-architecture>

Marketplaces have implemented standards to increase credibility of NFTs, currencies have decreased gas fees, investors sign up on codes of conduct and governments start to edit papers to increase legal certainty. All factors that help to make NFTs safe and widely usable once the market bounces back and the spread gets wider. Chances however seem high.

2.2. Benefits for architecture

Architecture in particular profits from the upside of NFTs. An NFT provides a record of authenticity and ownership that remains immutable on the blockchain. This safety guarantees intellectual property, as far as the creator of the NFT has intellectual property rights. It makes renderings visible that would have only been spread after signing non-disclosure agreements or similar. NFTs give renderings, and there through the visual aspect of architecture, a new stage without disclosing or sharing the 3D model itself. This is a great level of protection, without needing to hide the artwork from possible theft. Probably the greatest advantage of NFTs in architecture.

Limitations may be seen in the implementation to the real estate market. Real estate has been sold as NFTs but there are many open legal questions to this, and architecture however does not really benefit from this supply chain as this can lead to scaling plans without considering the surrounding of the architecture for example in a urban context.

3. Legal perspective

3.1. Introduction

Any transaction we do, in real or virtual worlds, implements legal consequences, as law itself simply structures and determines everyone's life, relations and actions. NFTs are just as well part of the "legal" world or in other

words, have legal consequences and impacts on involved parties and society in general. Questions such as:

- What is the relation between the buyer and the seller of an NFT?
- What do I get when buying an NFT?
- Are there any protection rights that become applicable, such as consumer rights, stock market regulations, etc.?

And of course:

- What is an NFT (legally spoken)? Is it a right, an obligation, a piece of data, or even a (virtual) value paper?

All these questions arise with the dawn of NFTs and have not found final answers yet. However, one needs to understand that the complete worldwide legal system is bound to states sovereignty, which means that each state releases their own law and enforcement and is not bound to other than international treaties, giving a guideline of mainly values, that usually regions agree, to uphold within their legislation. Law is therefore bound to territoriality. What is legal in one country can be completely illegal in another. This territorial aspect is key when it comes to the legal impact of NFTs and has not really been discussed so far.

3.2. “The Shoppingmall”

The following explanation on legal issues regarding NFTs focuses on NFTs of architecture. Main example will be the NFT “*The Shoppingmall*” by NFA non fungible architecture LLC, sold on OpenSea platform in January 2022⁶⁸. This NFT contains a rendered video that got minted as an NFT. The smart contract,

⁶⁸<https://opensea.io/assets/ethereum/0x495f947276749ce646f68ac8c248420045cb7b5e/74397760072486034972965634679540502232968768144542915179265262342509841874945>

as preexisting on the OpenSea marketplace, simply reads that the NFT guarantees protection and tradability of the exact containing work (so the video), and nothing more. Further only royalties for the artists were implemented.

The text of the artist on the artwork on OpenSea however refers to more content to be attached to the NFT and reads:

“The NFT comes with the right of first refusal on the architectural section and floor plans which can be purchased at a fixed price of USD 200’000 within 7 days after the purchase of NFT.”

Furthermore:

“By purchasing the NFT of the video you will not only receive the 100 MB version that is contained in the NFT itself, you will also have the right to exclusively download the same visualization in 1000 MB version for your sole and exclusive use.”

And last but not least:

«To make this visualization of haute architecture livable we implement a free offer of our partners in metaverse who can implement all possible use of space tailormade for your personal needs.»

Are these binding obligations, that can be enforced based on the sole description details on the marketplace OpenSea? And which rights are deductible directly from the purchased NFT? We shall focus on these questions when going through various legal questions concerning NFTs and will refer to this said example.

Further to the NFT itself and the sale-purchase event as such, we need to as well consider the *contractual basis of the creation of the NFT* to understand all applicable rights and possible exposures.

We get back to our example NFT with the following explanation of the creation of the NFT, which is applicable to most NFTs that are traded on open platforms. “The Shoppingmall” NFT was minted, launched, and sold by NFA non fungible architects (hereinafter NFA), a limited liability company domiciled in Zug, Switzerland. The artist, Marc Wieneke, a German architect, gave his work “The Shoppingmall”, which by the way uniquely contains the video rendering with tailor-made music, to NFA. This transaction was settled with a so-called *artist agreement*⁶⁹. Based on the artist agreement NFA was legal entitled to mint (create) an NFT of the given work and present and promote this work on the OpenSea platform. The agreement read that the artist receives 80% of the effectively achieved sales price and NFA would keep 20% for its work which resembles somehow a gallery’s contract with artists (although the pricing there is 50/50).

This artist agreement has no direct input on legal questions regarding NFTs. It is a regular “real life contract” which defines crucial elements such as content of work, copy rights, termination, applicable law and enforcement. Any legal dispute between the artist and NFA as a service provider and seller of NFTs (gallery-like) would be ruled based on the contract. This contract is not part of the legal questions that we want to look at regarding NFTs. Legal questions on NFTs occur where the NFT is sold on a public platform and by transfer of the relevant blockchain ledger which generally contains the relevant rights.

3.3. Procedure

The first issue to cover is the mentioned question of jurisdiction. Once understood, that we do have a serious battle to define the applicable law and jurisdiction, we seek for common ground in defining the legal qualification of an NFT. The possible definitions of NFT have taken some space within the legal world and pending law cases in the US (all initiated by SEC) give hope to a reliable criterion for applicable definitions. However, the discussions are still purely intellectual and lack rulings or the passing of specific laws. This essay

⁶⁹ Text of artist agreement with NFA upon request to the author.

will survey the question of NFTs being Securities, Commodities or simply value papers for Intellectual Properties. Further it will cover the difficulties of Smart Contract as they are prefabricated and can hardly be adjusted tailormade which might be solved by standardized licenses clauses⁷⁰. Last, we touch ground with further legal questions such as tax and AML issues, just to give a glance on further legal discussions that occur from NFT sales.

4. Jurisdiction first

For any legal action to be taken, there is a point of reference needed, with the inflicted jurisdiction and the seized court. One cannot file for divorce in the US without being a US citizen, having been married in the US, contractually agreed on US law and courts, or any other real-life connection to the territory, requested to rule a case.

Now how does this apply to NFTs, which by definition are not bound to territorial aspects at all. Let us first look at the exemplary “Shopping Mall” NFT and find out which jurisdiction would be applicable for any lawsuit out of the sale of this particular NFT.

4.1. Exemplary NFT

“The Shoppingmall” was minted on OpenSea *marketplace*⁷¹. The procedure for the minting is defined by the marketplace and so are the options on what the underlying smartcontract can provide.

A *smart contract* is a blockchain based source of information that is part of an NFT and describes certain legal aspects of the sales contract, such as intellectual property rights, royalties, gas fee. Additional to the smart contract comes the *description* of the NFT for the marketplace that can be seen when the NFT is launched and exposed for sale. It is only visible with the first launch,

⁷⁰ «Can't be evil» licence created by Creative Commons.

⁷¹ www.opensea.io

so with the creator's presentation on the marketplace. Once the NFT is transferred to the buyer, the text is no longer visible. This text therefore qualifies more as a marketing tool, but it can include binding offers just as we see with our example "The Shoppingmall" where extra rights are promised upon purchase of the NFT such as a right of first refusal for the plot plans for a fixed price and the delivery of an 1000MB file upon request. The legal binding of such description is questionable and again: where would you file a lawsuit for such enforcement.

To start the creation of an NFT one needs to choose the marketplace and create an account with the marketplace. Such accounts do not reveal your personal data. You choose who you are, and most marketplaces do not even ask for an e-mail contact but only the wallet that stands behind your account. So, one needs a crypto wallet, funded and ready to connect to the marketplace⁷². Finally, the data for the particular NFT is needed in the data versions that can be uploaded and in the data quantity that can be excepted. In our exemplary NFT "The Shoppingmall" the file had to be max 100MB, which for the video was a very low quality. Therefore, the text to the NFT read that the owner would have access to the 1000MB file. However, these limitations in minting need to be respected.

Depending on the marketplace one needs to have the right crypto currency wallet to pay for so called gas fees (Ethereum for OpenSea). This is a service fee⁷³ to all the minters and can be quite high depending on the actual time of day the minting takes place. Marketplaces like OpenSea have a lazy-mint option, which means the real minting (and the fees) will only happen, once a buyer decides for the NFT. The minting of all the relevant information, which is

⁷² For example, Metamask or Coinbase are common wallets where you buy crypto currencies against FIAT (usually by credit card) and where your NFTs will be connected to. The wallet is the proof of ownership. And wallets are not created by personal identification but by a set of usually twelve random words that are the key to the wallet. Lost these pass phrases the wallet cannot be found anymore.

⁷³ "A blockchain is a distributed database or ledger that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format. Blockchains are best known for their crucial role in cryptocurrency systems for maintaining a secure and decentralized record of transactions. The innovation with a blockchain is that it guarantees the fidelity and security of a record of data and generates trust without the need for a trusted third party."

<https://www.investopedia.com/terms/b/blockchain.asp>

the data of the artwork itself and the smart contract, is done by the marketplace. Technically all information that is fed to the system is transferred into a blockchain ledger which guarantees immutability which is the safety an NFT brings to the market.

The minted (created) NFT will be visible on the wallet of the creator, so practically the wallet that was connected to the marketplace account. All transfers from this creation wallet to the buyer and the next buyer and so on, can be seen on the blockchain and will not disappear. That is practically the only trace an NFT leaves without ever identifying a person or entity behind the wallet. That reminds us of the ominous number accounts Switzerland was famous for until the crash of banking secrecy in the early 2000. For AML issues this is a serious problem we shall question later.

To get back to the question of the applicable law and jurisdiction, the question of *territoriality* occurs first. The plaintiffs can always try to file in their own jurisdiction, but against whom? The counterparties need to be located to define where a civil lawsuit can be accepted by the court. The court cannot take a case against an unknown subject (unless criminal law and official offence). So, declaring the domicile of the involved parties is mandatory and exactly what is missing in NFT transactions.

This differs with criminal offences. If these are official offences a prosecutor can take the case if the victim is domiciled in the respective jurisdiction, or the damage occurred within. However, here as well, it will be impossible to condemn an unknown perpetrator. Focusing on the necessity to know the involved parties, we get back to the exemplary case and find the following:

“The Shoppingmall” NFT is minted by NFA non fungible architecture LLC in Zug, Switzerland. This information is disclosed to the public and contact details are provided. The buyer of the NFT can come back to the creator and file for any misconduct regarding the purchase of the NFT. This is however not the common situation. Usually there is no identifying information on the creator available, no contact data, no company information, no personal indication of

where to reach out. Getting back to the creator of the NFT is practically impossible. The only referral given by the transaction itself is the wallet number the NFT comes from, nothing more.

Now this could lead to a legal connection through the *wallet*. But where is the wallet, physically? Or could the wallet providing company (metamask or coinbase f.e.) be a juridical connexion that can lead to a forum (a court that would take the case)? These questions have not been brought to court and it seems quite impossible to deduct the relevant jurisdiction from the crypto wallet company domicile. If such jurisdiction would be accepted the question of whom you file against is still not solved. The counterparty in any NFT sales contract is a number, a wallet number, and nothing more.

In the exemplary case of “The Shoppingmall” the possible fraudulent declaration of an artist needs to be considered as well. If the declared creator of an NFT denies such, the position of the plaintiff will be difficult in proofing who the actual counterparty is.

Further consideration in this context could be the applicability of the *jurisdiction of the marketplace*. In our example: Where is OpenSea as a company domiciled? That in itself is not easy to find out. The company declares the headquarters to be in New York City, but where is it domiciled? Even on the website there is no legal address visible. However, a clear connection to US jurisdiction can be presumed and obviously the company follows US laws and restrictions and was already prosecuted by the SEC. Does this give a seller or buyer on the marketplace a sufficient reason to file in the US? This question of course relates closely to the content of the claim. If there is a complaint regarding the services of the marketplace itself, then the territory can be presumably declared as US, New York City. If the complaint refers to a dispute between seller and buyer, then the domicile of the marketplace probably will not matter at all.

Last possible connection to find the relevant jurisdiction could be the declared *location of the NFT*. Where is the NFT itself? We mentioned the wallet, where

the NFTs data is saved. The wallet however is also only data and cannot be located. Blockchains do get created by interactions of different nodes of a computer network which are located around the globe and dialed in randomly. Therefore, the location of the underlying ledger is simply not declarable. It is, per definition, a potpourri of worldwide locations and continuous data transfer that changes by the second and cannot be defined or frozen at any stage. NFT is non fungible and even more nontangible. That leads to the conclusion that an NFT itself has no territory it is bound to, and no applicable law and jurisdiction can be deducted from the NFT itself.

4.2. General findings

If the creators of an NFT does not give any information on their identification, then it is practically impossible to file a suit against them. The only information that is revealed in the creation of an NFT is the crypto wallet it is built on and where the NFT was and is. This set of numbers does not lead to an identifiable subject and therefore neither criminal nor civil cases can lead to success⁷⁴. Filing against the crypto wallet company again does not make any sense as they have no connection to the effectively stored NFTs and the transfers of these (again, unless there is an infringement and liability for a transaction on their side).

Filing against a marketplace can only make sense if the marketplace itself committed an infringement. The marketplaces are truly diligent with complying to their domiciles legal system, but some still reside offshore and might therefore escape certain restrictions that come into force (especially in the US).

US courts are known to easily accept a connection to their jurisdiction. If a US citizen or company is involved in any infringement a US court would most probably accept the case. This leads to a *superiority of the US legal system* and prudent market players would probably want to comply with US perceptions ahead of risking lawsuits. The conclusion is not far that the attention on legal

⁷⁴ Although insider trading was alleged against a former manager of OpenSeas only by the fact that repetitively the same wallet number was used for similar transactions.
<https://www.nbcnews.com/tech/internet/opensea-nft-nate-chastain-arrest-charged-insider-trading-rcna31489>

cases regarding NFTs worldwide lies on the US legal system, starting with the legislation, followed by financial market supervisory systems as the SEC or IRS and ending in long expected court decisions on actual cases.

The following chapters on possible definitions of NFTs bases mostly on US law and Swiss law. The definitions are not as crucial as the questions of possible infringements. These questions are the same under every jurisdiction and defining them may lead to local answers that can be found applying the existing relevant code or case law.

5. Overview on possible legal definitions of NFTs

To understand an NFT from a legal aspect, definitions of existing legal subjects have been used to declare the legal structure, regulations and boundaries of NFTs. Mainly three different existing legal definitions have been challenged so far to see if they may fit with what an NFT is. An NFT could be a commodity, a security, or an intellectual property. These three different legal subjects come along with different regulations that apply which is why the definition, or exempt of such, is somehow mandatory to guarantee legal certainty for all players in the market. Legal certainty will help to improve the reputation of blockchain based transactions which is why generally all relevant market players are interested in finding an applicable regulation.

The following chapters refer mainly to US law and definitions which again, seem to be leading in the field, due to the fact, that nearly in any blockchain based transaction a legally effective connection to the US may be found. Most relevant companies have a domicile under US law and all sell in the US or to US citizens. The findings of US courts will have major influence on the worldwide perception of NFTs and blockchain technology, so it does make sense to emphasize on the actual status in this jurisdiction.

5.1. Commodities

According to the US Commodity Futures Trading Commission (CFTC) cryptocurrencies are declared to be commodities although they are nontangible, in comparison to classical commodities such as gold, copper, and other metals.

NFTs, just as cryptocurrencies, base on blockchain technology and they can be traded as well. However, NFT are not exchangeable and that is the crucial difference to fungible tokens (cryptocurrencies). It has not been decided yet if NFTs could be considered commodities.

Under US law commodities are protected from manipulative trading by the Commodity Exchange Act (CEA). If NFTs would be considered to qualify as commodities the CEA would be applicable and manipulative trading could be prosecuted. It seems quite difficult to apply these regulations on sales that cannot be identified since wallets are numbers and not individuals. The only outcome could be the ban of certain wallets to the market. Such measures are not foreseen in the relevant act, and it would obviously take quite a step to enforce the CEA on the NFT market⁷⁵.

5.2. IPR

NFTs are famous for being a unique and non-fungible guarantee for the underlying data. The ledger of the precise NFT is what the owner can refer to being his or her right. The NFT upon creation is an intellectual property in itself. If we get back to our “The Shoppinmall” NFT we understand that the NFT contains the 100MB data including the video, underlaid with specific music, showing the flight trough a building that actually is the relevant intellectual property right (IPR) in this artwork. However not the plot plans or the building are transferred. Not even is the intellectual property of the building or the plans regulated trough the NFT. The only right that can be transferred with the NFT is the intellectual property of the 100MB data in the NFT itself. And that has implications on the surrounding IPR.

⁷⁵ Darya Yatchenko, “How Are NFTs Regulated: Legal Issues, Taxation Aspects and More”, 14 April 2022

What if the 3D model of this work does not belong to the creator of the NFT?
What if the purchaser of the NFT wants to use the 3D model to sell the real building only based on the video without any rights to the plans?

The so-called underlying assets of an NFT, in our case the original 3D model and the plans, cannot be prevented from replication and commercialization⁷⁶. The purchaser of an NFT needs to understand that the NFT is an IPR but only as far as the data in the transferred NFT is concerned. And this is when local IPR regulations come into force. The boundaries to the use of the transferred IPR by the particular NFT need to be respected according to the legal territory it shall be used in⁷⁷.

Getting back to our example “The Shoppingmall” we furthermore need to consider, that the issuer of the NFT (NFA non fungible architecture) is not the creator of the underlying artwork (which is Marc Wieneke). The issuer only receives the rights that the creator assigns. And only these rights can be transferred to the potential buyer. This leads to the conclusion that buying unauthorized digital assets can only be prevented by making sure that the metadata of the NFT refers to metadata of the original creator⁷⁸. This has not been done with “The Shoppingmall”. With this NFT the only referable entity to guarantee transfer for intellectual property is NFA and the creator himself could always claim that his IPR has been infringed. NFA covered their liability with the so-called artist contract, but still, this does not directly guarantee the IPR of the purchaser of the NFT.

A strict legal approach would even state that NFTs do not have intellectual property rights at all⁷⁹. The fact that an NFT displays an underlying work of art does not permit the owner of the NFT to any IPR without explicit license

⁷⁶ Darya Yatchenko, “How Are NFTs Regulated: Legal Issues, Taxation Aspects and More”, 14 April 2022

⁷⁷ With specific Q&A: Foley & Lardner LLP (2022), “NFT Art – Your Top 40 Legal Questions Answered”, 5 August 2022, National Law Review, Volume XII, Number 217.

⁷⁸ Gurcan Partners (2022), “Legal aspects of NFTs” <https://gurcanpartners.com/en/legal-aspects-of-nfts/>, visited on 31 October 2022.

⁷⁹ Open Geeks Lab (2022), “9 Legal Issues That Stand Behind NFTs”, <https://opengeekslab.com/blog/legal-issues-nfts/>, visited on 31 October 2022.

agreement with the actual owner of the relevant IPR. The creator of the artwork should be the only entitled to decide on the use of the NFT.

In a nutshell every NFT is an IPR but only for the explicit data transferred by this NFT. Any underlying artwork have their own IPR which usually goes back to the original creator and can be licensed. With NFTs one does still move within the strict boundaries of intellectual property laws and needs to statute the use of work with the declared creator of the artwork. The implementation of NFTs does not solve the IPR issues per se. It just adds another IPR, which is the one deriving from the NFT itself.

5.3. Securities

The subject comes up in different jurisdictions. The most published are regarding US law. Further Swiss law takes a step forward with definitions and influences European jurisdictions, which will be explained herein after.

5.3.1. Definition of Securities under US law

The probably most interesting and meanwhile widely discussed question is, if NFTs are securities under US SEC law and regulations. The common answer to the question whether NFTs can be considered securities or not is “maybe”. As with all legal definitions the actual case matters and gives the necessary information that can be valued as fulfilling criteria or not. Starting with the definition of a security, the Supreme Court established the prominent Howey test based on the case SEC v. W.J. Howey Co., from 1946⁸⁰:

“In this landmark decision, the investors purchasing interests in the orange groves in Howey were passive and relied on the developer’s efforts to service the groves, which fit squarely into the purview of an “investment contract” definition adopted in the same Supreme Court decision. Since Howey, investments in different non-security assets “wrapped” in investment contracts are considered securities, including

⁸⁰ 328 U.S. 293, 298 (1946)

the textbook cases of whiskey barrel interests, golf, and country club memberships. and in general, other investment instruments in which investors are earning passive income from the efforts of others.

All of these were, effectively, passive investments in a promoter's enterprise (whether selling whiskey or building a golf club and facilities) with the investor's participation limited to providing capital with the hope of a favorable return. In the absence or failure of the promoter's efforts, investors faced a substantial risk of losing the invested funds.”⁸¹

Practically this leads to declare an NFT being a security if it is offered as an investment contract. But an NFT is according to the SEC framework of 2019 not a security simply because it can increase in value:

“Price appreciation resulting solely from external market forces (such as general inflationary trends or the economy) impacting the supply and demand for an underlying asset generally is not considered profit under the Howey test.”⁸²

According to the Director of the SEC's Division of Corporate Finance, William H. Hinman, NFTs with certain consumer value may be judged as securities according to the following factors:⁸³

- a. NFTs that are sold to the general public with the promise of instant liquidity, can be looked at as investment products more than digital collectibles.
- b. If the issuer is creating facts to increase the value of the NFT, then managerial efforts would influence the profit, which is definitely covered by the Howey test and qualifies as security.⁸⁴

⁸¹ Max Dilendorf / Bari Zahn, “Will NFTs be Deemed Securities Subject to the U.S. SEC Laws and Regulations?”, 2021, Dilendorf Law Firm PLLC

⁸² Stephen P. Wink / Miles P. Jennings / Shaun Musuka / Deric Behar, “NFTs: But Is It Art (or a Security)?”, 12 March 2021, Latham & Watkins LLP.

⁸³ Max Dilendorf / Bari Zahn, “Will NFTs be Deemed Securities Subject to the U.S. SEC Laws and Regulations?”, 2021, Dilendorf Law Firm PLLC

⁸⁴ Controversial whether an attachment to a body corporate and performances of this corporate is requested for qualification as securities under Section 2 of Securities Contract Regulation Act, 1956

- c. The manner of sale, number of copies, promised value, royalty or revenue share might make an NFT a security.

The conclusion of the Howey test however is that NFTs need to be considered regarding their appearance in the market. Each NFT has a different content, a different transfer or rights, a specific value and expectations according to the marketing. This leads to the convincing thesis that there is no clear qualification for NFTs but that there is a potential risk for NFTs to be considered securities without creating a binding example for other NFTs.

If we look at our example NFT “The Shoppingmall” we may find that the underlying artwork, the 3D model and the video, are definitely not securities. Just like a physical painting would not be considered a security and therefore there is no justification for digital art (and here even digital twins) to be treated differently. However, fractionalization of art by dividing the value of one piece of art on a (usually large) quantity of NFTs could make the asset a security⁸⁵. The value and tradability are mandatory for the buyer and not so much the underlying artwork per se. The investment instrument and the management of the complete fractionalized artwork are the unique selling proposition. Further we find NFTs that guarantee membership or voting rights (even for DAOs), such do not constitute a security⁸⁶. The mandatory dependence of influence of the management performance within the Howey test, does finally exclude most digital art of being securities.

The crucial question behind the qualification as a security is, what happens if an NFT is considered a security.

5.3.2. Consequences for NFTs if declared securities

The main issue with an NFT being a security is the vast amount of laws and regulations that become applicable. First to mention is the mandatory

(SCRA), “other marketable securities”. See: Mitali, “Classification of NFTs: Securities, Goods or Contracts?”, 2 September 2021, Metacept.

⁸⁵ Open Geeks Lab (2022), “9 Legal Issues That Stand Behind NFTs”, <https://opengeekslab.com/blog/legal-issues-nfts/> 31 October 2022

⁸⁶ Merav Ozair, “Not All NFTs Are Securities”, 23 November 2021.

requirement to register with the SEC as a security. Once the securities are registered a different set of regulations come into force, such as limitation on marketing and transfer, obligation to register as broker or dealer, respecting anti-fraud provisions of securities laws to not mislead investors and proper characterization of assets for tax purposes.

NFT marketplaces need to consider that NFTs that may fall under the definition as securities will lead to the broker-dealer status according to the Securities Exchange Act or the definition as investment advisor under the Investment Advisers Act.

Not complying with the regulations may lead to civil and criminal penalties even if the NFT creator or owner, or the marketplace, was not aware of the classification as such.

5.3.3. Securities under Swiss law

As discussed earlier, NFTs in general cannot be treated as one of a kind and will not by definition fulfill legal qualifications. BaFin (the German supervisory body of the finance market) declares:

“However, if NFTs embody rights similar to securities, are transferable and tradeable, they must be classified as asset investment under the EU Prospectus Regulation, or the Asset Investment Act and a prospectus must be prepared.”⁸⁷

The protection of the investor, or consumer, in the complex and risky financial market is the focus of the regulations and if an NFT bears the same risks the relevant laws become applicable which does make sense but again needs to be evaluated by court decisions.

⁸⁷ https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Fachartikel/2023/fa_bj_2303_NFT.html

Swiss law and Swiss supervisory *FINMA* follows the same understanding.

FINMA went further in categorizing tokens into ⁸⁸:

- Payment tokens
- Utility tokens
- Asset tokens
- Hybrid tokens

Payment tokens are cryptocurrencies which, according to FINMA, are not treated as effects (securities) under Swiss law but underlie AML regulations. Utility tokens include access to certain in services which are functional upon purchase. These tokens are not considered effects according to FINMA interpretation. Asset tokens however, can represent a debt claim and consist of value rights. If they do meet the additional criteria for securities⁸⁹, they qualify and need to comply with specific securities regulations. Hybrid tokens, last, are a mix of utility and payment tokens, and need to be considered individually.

If an NFT would be treated as effect, dealers of such products understand the Federal Act on Financial Institutions (FinIA, SR 954.1) and need to fulfill several duties, especially on information and investor protection.

Securities under Swiss law are defined in Art. 2 of the Ordinance on Financial Market Infrastructures and Market Conduct in Securities and Derivatives Trading (FinMIO, SR 958.11):

«Securities are deemed to be standardised and suitable for mass trading if they are publicly offered for sale in the same structure and denomination or are placed with more than 20 clients, insofar as they have not been created especially for individual counterparties.»

The Financial Market Infrastructure Act, FinMIA, SR 958.1, explicitly implements DLT securities, which means Ledger based securities. This amendment was

⁸⁸ <https://haerting.ch/wissen/nft-eine-finanzmarktrechtliche-beurteilung/>

⁸⁹ according to Art. 2 FinMIA, Financial Market Infrastructure Act, SR 958.1

implemented by the DLT regulations that became effective mid 2021⁹⁰. Art. 2 of FinMIA defines financial instruments that fall under regulations as such:

“a. Financial market infrastructure:

- 1. a stock exchange (Art. 26 let. b);*
- 2. a multilateral trading facility (Art. 26 let. c);*
- 3. a central counterparty (Art. 48);*
- 4. a central securities depository (Art. 61);*
- 5. a trade repository (Art. 74);*
- 5a. a trading facility for DLT securities (DLT trading facility; Art. 73a);*
- 6. a payment system (Art. 81).*

b. Securities: standardised certificated and uncertificated securities, in particular uncertificated securities in accordance with Article 973c of the Code of Obligations (CO) and ledger-based securities in accordance with Article 973d of the CO, as well as derivatives and intermediated securities, which are suitable for mass trading.

b^{bis}. Distributed ledger technology securities (DLT securities): securities in the form of:

- 1. Ledger-based securities (Art. 973d CO); or*
- 2. other uncertificated securities that are held in distributed electronic registers and use technological processes to give the creditors, but not the obligor, power of disposal over the uncertificated security.”*

The criteria according to the US Howey test, where management efforts need to influence the value development, does not exist under Swiss law. *Negotiable securities* (Wertpapiere) according to Art. 965 Code of Obligations, SR 220, are all instruments,

⁹⁰ Find more details on DLT Act under chapter AML issues.

“to which a right attaches in such a manner that it may not be exercised or transferred to another without the instrument.”

This does apply to NFTs. However, a negotiable security implements the necessity to provide the certificate (also blockchain based) to receive the underlying obligation. Without certificate the duty to obligation expires. However Swiss law distinguishes certificates of daily use, such as entry tickets, railway tickets, luggage receipts, to not qualify as negotiable securities but certificates with simple proof value. This might be an interesting delineation for NFTs as well⁹¹.

Getting back to the FINMA approach of categorizing tokens, the EC in comparison, did decide to categorize tokens as well but slightly differently, which for now does not make a big difference. The fact that all these different NFTs or tokens should be valued according to their impact on the market leads to the wish to generalize criteria for either applicability of certain regulations or not. The outcome will be decided on the relevant cases and most probably not only by implementation of new specific regulations. Worldwide tendency seems to presume having enough regulations to sort out the blockchain related legal questions.⁹²

5.4. Smart contracts

Blockchains enable a trustless version of the internet, where users rely on centralized services and corporations, instead of the trust in the counterparty. Cryptographic proofs distribute trust, and the enforcement is based on codes. To ensure by code that the contractors are aware of the content of their agreement, initiatives like the “can’t be evil” project were born to guarantee minimum understanding, transparency and liability in NFT purchases and to harmonize real-world with virtual ownership⁹³.

⁹¹ <https://www.lw-p.ch/de/rechtsthemen/wertpapiere/>

⁹² <https://eur-lex.europa.eu/legal-content/DE/TXT/HTML/?uri=CELEX:52020PC0593&from=EN>

⁹³ Andrew Hayward, “Andreessen Says Its ‘Can’t Be Evil’ NFT Licenses Will Help Avoid Legal ‘Ambiguity’”, 31 August 2022.

Miles Jennings / Chris Dixon, “The Can’t Be Evil NFT Licenses”, 31 August 2022.

Using a marketplace to mint an NFT usually gives very limited access and possibilities for smart contracts. The creator of an NFT can choose among options that have tick fields but no individual amendments. The question occurs, whether more detailed information, that can be found in descriptions of works are legally binding, and if considered so, also enforceable.

“The Shoppingmall” NFT has taken such risk and offered additional obligations which however need to be claimed by the purchaser. If such claim was to be addressed the creator (NFA) would need to have a proof of the claimant being the buyer. The buyer simply identifies by the crypto wallet, which is no more than a ledger of digits. The identification process can become a difficult task to solve. However only then the obligation can be fulfilled correctly and the transfer of the additional rights to the wallet or the identified wallet owner can be executed. With “The Shoppingmall” NFT the creator states the right to receive a 1000MB file. This cannot be transferred to a wallet because it is technically not possible to mint an NFT with such a mass of data. Therefore, the recipient needs to be identified properly to transfer the file and a different proof of delivery needs to take place because the safety of the blockchain based transfer is missing. These practical aspects need to be considered next to the legal aspects. How this issue was solved with the relevant example NFT is not disclosed.

5.5. Tax issues

Many marketplaces, such as OpenSea, do offer a *tax declaration form* for the NFTs that are bought and sold with a certain wallet. This however just is a form and without filing the form there is (maybe illegally, but however) no tax implication, due to the fact that the wallet owner, and therethrough the NFT owner cannot be identified.

In general, it is clear that all *income or capital gain* (however created) is taxable at domicile of the beneficiary individual or entity. If we go back to our example

NFT “The Shoppingmall”, we find that the selling company needs to declare the sale as gain, deducting the payments of 80% to the artist. The artist then needs to declare his income in his domicile country.

Relevant argument can then be if the purchase price was transferred into a FIAT currency or if the crash of the crypto currency was suffered by the seller. Depending on this, the amount of taxable gain will change of course.

As the NFT was sold at a visible amount and currency, the taxable revenue is defined. For the buyer the situation is similar. He or she needs to declare the assets and here is where the legal questions pop up: What kind of asset is an NFT and if it is a taxable asset, what would the value be. Let's say the purchase price is in Ethereum (ETH) and at the time of the purchase was equivalent to USD 100'000, does this mean that the value of the NFT is said USD 100'000? As we are aware of the crash of crypto currencies the value of the NFT in ETH had decreased of 50% from November 2020 to November 2021. What value of NFT should the buyer be taxed on? Is the NFT worth the buying price. Probably not. But as there is no such thing as a stock market for NFTs where one sees the development of the value, it can only be speculated and maybe even accepted as “non-valeur” until a sale takes place.

This leads to the question if an NFT is per se an asset that underlies tax law.

A globally accepted and comprehensive solution to NFT tax implementation is missing. One reason is that NFTs do not have a globally accepted definition. They could be (legally) all sorts of items, as discussed earlier f.e. commodities, securities, artwork and so on. The other difficulty occurs from the fact that valuation is problematic.

The *Federal Swiss Tax Authority* has published a guideline in form of a working paper for payment tokens (fungible tokens, mostly crypto currencies or utility tokens), declaring that these fungible tokens have a certain value that can be either declared due to the official change rate or, if this is not possible, due to

the purchase price⁹⁴. These values need to be declared as property but do not automatically generate income. Selling and buying tokens with profit does generate tax free capital gain for individuals, unless these transactions are self-employed income. According to the working paper, withholding tax and stamp duty do not apply to tokens. The working paper does only refer to fungible tokens but can be used as applicable guideline for the taxation of non-fungible tokens as well.

Tax experts differentiate between NFTs as a digital asset and proof of underlying rights⁹⁵. If the NFT is just a digital confirmation that a certain physical artwork belongs to the owner of the NFT (guarantee of ownership) then the NFT itself is tax exempted because the underlying asset will be taxable.

Another crucial question is whether VAT is applicable. In EU countries there is no official guidance on the VAT treatment of NFTs. General tax rules need to be interpreted. The understanding within European jurisdictions is, that NFTs, which comprise a supply of electronic services, fall under Value Added Tax. The definition of electronic services can be found in the European Union Council Directive 2006/112/EC, the Council Implementing Regulation (EU) No 282/2011 and the United Nations Model Convention 2021. The definition includes

“automated digital services that involve minimal human interaction”

which may be sufficient to implement VAT duty to NFT. The tax regulators have not set a binding ruling yet in EC or Switzerland⁹⁶.

The Spanish Tax Administration, which was the first tax authority in the EU to comment on NFT sales, found, that NFTs must be seen as electronically supplied services and therefore not transfer of right to tangible goods would be supplied. Therefore, VAT would be applicable⁹⁷.

⁹⁴<https://www.estv.admin.ch/estv/de/home/direkte-bundessteuer/fachinformationen-dbst/kryptowaehrungen.html>

⁹⁵ <https://ptgr.ch/blog/nft-steuer-schweiz/>

⁹⁶ <https://www.mme.ch/de-ch/magazin/artikel/non-fungible-token-nft-und-mehrwertsteuer>

⁹⁷ <https://www.iberley.es/resoluciones/resolucion-vinculante-dgt-v0486-22-10-03-2022-1538333>

An exemption for virtual currency transactions from VAT applicability has been ruled by the Court of Justice of the European Union (CJEU)⁹⁸. The relevant bitcoins were found to serve no other purpose than national currencies and therefore the VAT exemption for currencies had to be ruled. An analogy for NFTs would need to be challenged.

5.6. AML issues

The US congress adapted the Anti-Money Laundering Act (AMLA) in 2021 by expanding the definition of financial institutions to businesses involved in currency like exchanges. The AMLA also involves everyone who trades art.

The EU adopted the so-called MiCA Proposal which includes a digital finance regulation for crypto assets. The main goal of MiCA is to streamline blockchain technology and crypto asset regulations within the EC.

The existing AML regulations do of course apply worldwide to all financial transactions. Every NFT sale must be checked under AML guidelines if they are applicable. If we go back to the sale of “The Shoppingmall” by the Zug based company to a unidentifiable wallet for a presumed amount higher than 100k CHF, we find that AML issues according to the Swiss AML regulations⁹⁹ only apply if the seller is a person or entity who qualifies as financial intermediary or professionally trades goods and accepts cash (dealer). In case of the Zug based NFT company, minting and selling NFTs of artist/architects the AML regulations will definitely not be applicable. However, the Swiss Criminal Code states in Art. 305bis for Money Laundering that:

“Any person who carries out an act that is aimed at frustrating the identification of the origin, the tracing or the forfeiture of assets which he knows or must assume originate from a felony or aggravated tax

⁹⁸ <https://curia.europa.eu/juris/liste.jsf?num=C-264/14>

⁹⁹ Geldwäschereigesetz SR 955.0, Geldwäschereiverordnung SR 955.01

misdemeanour shall be liable to a custodial sentence not exceeding three years or to a monetary penalty.”

The NFT seller is not allowed to sell an NFT if he/she knows that the sale takes place in order to hide the tracing of funds which assumably originate from crime. Now when would this be the case. The buyer is a wallet number and not a person. However, some wallets are notoriously conspicuous. Famous or extremely huge wallets can be found on the internet with remarks on possible infringements such as theft or scam. Now does this imply a duty for all transactions to be surveyed and a duty for the seller to check the buyer as far as possible. In other words: If NFA sells to a wallet that pops up as fraudulent, could NFA risk being under Money Laundering investigation? We could even take it a step further and consider if a certain control would not be mandatory due to the fact, that crypto currency, with which NFTs are bought, have a hugely bad reputation and therefore can be valued as most probably deriving from felony. Answers are impossible at this stage but a certain awareness of the possible implications seems mandatory.

Switzerland has brought worldwide the first Federal Act on the Adaptation of Federal Law to Developments in Distributed Electronic Register Technology into force as of 1 August 2021 (DLT Act, distributed ledger technology act)¹⁰⁰. This act adapts ten existing federal laws, among which AMLA and the Code of Obligations. If a financial intermediary now helps someone to transfer virtual currency, then this transaction falls under the existing AML regulations. Further the introduction of uncertificated securities on blockchain is enabled. Decentralized platforms and wallet providers and banks will find clarifications on their duties due to the implementation of the new law which may be a milestone and example for other jurisdictions to follow¹⁰¹.

¹⁰⁰ <https://www.admin.ch/gov/en/start/documentation/media-releases.msg-id-84035.html>

¹⁰¹ <https://www.bdo.ch/de-ch/publikationen/fachartikel/banking-newsletter/update-geldwaschereibekämpfung-de>

V. Findings

The relationship between architecture, metaverse, and NFTs is increasingly interconnected.

Architecture is an essential component for building virtual worlds, such as the metaverse. Virtual architecture can make or break the user's experience, just as physical architecture can impact one's experience in the real world. Virtual buildings, just like their physical counterparts, need to have design, direction, and infrastructure for them to provide meaning to the inhabitants of the metaverse.

NFTs (non-fungible tokens) are unique digital assets that can represent ownership of virtual and physical items. In the metaverse, NFTs can represent ownership of digital assets such as virtual architecture, real estate, artwork, and other virtual items. The concept of owning virtual architecture in the metaverse becomes more critical as more people enter these virtual worlds to live, work, and play. In the future, NFTs will be implemented in architecture designs, where a digital blueprint of a building or structure can be sold as an NFT.

As NFTs become more prevalent, the legal issues surrounding them will only become more complex. It is important for those who create, buy or sell NFTs to stay up-to-date on the legal implications of these digital assets, and to seek legal guidance when needed.

In conclusion, the relationship between architecture, metaverse, and NFTs is intertwined, and these three components will continue to build on each other as the metaverse grows and becomes more connected with the physical world.

Interest remains in following these evolutions and implement knowledge and understanding of our thousands of years old physical culture, with the noble intention to increase life standard and quality for society, whether physical and/or digital.

Abbreviations

AML	Anti Money Laundering
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht
DAO	Decentralized Autonomous Organization
EC	European Community
etc.	etcetera
FinMa	Eidgenössische Finanzmarktaufsicht
IPR	Intellectual Property Rights
IRS	Internal Revenue Service (US tax authority)
NFT	non-fungible token
SEC	Securities and Exchange Commission
SR	Systematische Rechtssammlung

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