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TOKEN-ART SYSTEM AND THE NEW INTERNATIONAL ART MARKET: THE IMPACTS OF NFT TECHNOLOGY AND THE LEGAL ASPECTS INVOLVED

ABSTRACT

The international expansion of arts events and the installation of museum franchises in different countries reinforces that the artistic sector has acquired a globalised sense. The online arts market has grown considerably through the influence of social media both for the discovery of new artists and to attract new potential customers. At the same time, technological innovations such as cryptocurrency and blockchain have a high capacity to transform the arts market. And within this scope, two extremely dynamic digital assets are increasingly being used: smart Contracts and NFTs - or “non-fungible tokens”. Studies have shown that this technology applied in this market has presented advantages in the authenticity, origin and traceability of art sales. Such transactions, however, have legal effects especially on contracts and property rights. Thus, the present work aims to reflect on the legal implications, especially regarding the management of intellectual property and the adoption of smart contracts in commercial transactions in the international arts market, generated by the impact of NFT technology. The deductive methodology will be used, with theoretical-doctrinal analysis of the information obtained by primary and secondary bibliographic research.

JEL CLASSIFICATION: K22, K24, K33

SUMMARY

1 Introduction – 2 International Art Market – 3 Blockchain and NFT technologies – 4 Legal implications – 5 Conclusions

1 Introduction

Every human creative expression can be considered art if it transmits valuable or significant meaning to society. Therefore, art involves a diversity of segments. In a society impregnated by scarcity the system of exchange between producers and consumers aims the satisfaction of vital needs, providing a better quality of life to the

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population. In this sense, it seems that the art has lost its value, due to the usefulness factor our society requires from the assets in circulation, hence the works of art in general are considered superfluous goods. However, the art market has great influence in the global economic movement, as shown by some analytical reports of the segment.¹

Throughout its history, the art market occupied an “elitist and reserved place for an exclusive public.”² The arts market is considered exceptional: on the one hand it is a sector, among all economies, which is less transparent and less regulated; on the other, it is marked by the strong contradictory rationale between the logic of art and the logic of economy itself.³ The lack of transparency of the art market can be caused by the fragmentation of the sector’s regulation, the shortage of specialists or the absence of uniform standards that make it difficult to measure the benefits of this market.⁴ This is because it is a highly ritualised trade, where there is a clear differentiation between art and economy. Art agents tend to prioritize the creative aspect of the product and its enterprises, while the economic character is never objectively clearly addressed.⁵

However, the international expansion of art events and the installation of franchises of world-renowned museums worldwide, which took place in recent decades, reveal how the artistic sector has acquired a globalised sense. But it is necessary to consider that the sphere of artistic production is different from the institutions that showcase the final artistic “product”, since the productive source is not always a target of heavy investments, while institutions that hold the space and infrastructure have great capacities to move the business, expanding their collections.⁶

In recent years, also driven by the global pandemic, the online art market, has grown considerably through the influence of social media both for the discovery of new artists as well as to attract new potential customers.

Technological innovations such as cryptocurrency and blockchain are quite productive, with high capacity to transform the art market. Although such technologies are spread increasingly, presenting advantages, with the possibility of applying to different sectors of the economy, the art industry remains somewhat reticent, especially regarding the use of cryptocurrency, stating that there is a risk “to create a

¹ There is some difficulty in obtaining complete data on the international movement of the arts, not only due to the lack of academic research due to the lack of attention given by art historians, and, therefore, it does not attract significant researchers in art and culture, but also because of the shortage of economic analysts specialising in art. Cf. Elena Sidorova, ‘The Cyber Turn of the Contemporary Art Market’ [2019] 8(3) *Art Markets and Digital Histories* <<https://doi.org/10.3390/arts8030084>> accessed 20 August 2021.

² Naira C. R. Assis, ‘As regras do mercado: dinâmicas e construção do valor no mercado de arte contemporânea’ (Dissertation, Universidade de São Paulo 2017).

³ Ibid.

⁴ Irene Micheletti, ‘Art-Tech: blockchain come opportunità di valorizzazione partecipata’ (Bachelor’s thesis, University Ca’Foscari Venezia 2020).

⁵ Naira C. R. Assis, ‘As regras do mercado: dinâmicas e construção do valor no mercado de arte contemporânea’ (Dissertation, Universidade de São Paulo 2017).

⁶ Ana Leticia Fialho, ‘O mercado, os artistas, os colecionadores e as instituições’ [2017] 13 *Ouvirouver* 378.

black market of dubious transactions and that can harm the reputation of the online market before new buyers.”⁷ On the other hand, within the scope of blockchain technology two extremely dynamic digital assets are being increasingly used: Smart Contracts and NFT - or “non-fungible token”. Studies have shown that blockchain technology applied in art operations has been showing advantages either to improve the authenticity, the lawful origin and the potential of traceability of art sales, or to guarantee the protection of the collector’s privacy.⁸

Undoubtedly, the full use of such technologies is already revolutionising the art market. However, more in-depth study is needed on the different legal aspects that involve these transactions, especially in the management of copyright and the contract stipulation. Regarding copyright, if the technological structure itself offers the protection and certification of property, it would no longer be necessary the bureaucratic notary publicity for proprietary registration. But how to legitimize public faith for a private entity like the blockchain? Or how to separate the right of possession, control, exclusion, to derive income, and the right of disposition, while property and possession rights in this chain of blocks? As for Smart Contracts: the contractual form is neither oral nor written, but in codified language; the legal relations between the parties occur by anticipation and no longer after the signing of the contract; they are self-executable without the need for intervention. All these situations use institutes that deserve further analysis because they give new legal contours in this complex and peculiar artistic industry.

Thus, this work aims to reflect on the legal implications, especially regarding the management of intellectual property and the adoption of smart contracts in commercial transactions in the international art market, generated by the impact of NFT technology. Deductive methodology will be used, with theoretical and doctrinal analysis of information obtained by primary and secondary bibliographic research.

2 International art market

The art market has a special characteristic: in a horizontal segmentation it can be classified into primary and secondary market; the vertical segmentation, on the other hand, is classified based on the quality of the product, such as the classic and contemporary market, the avant-garde market, the alternative, and the scrap market.⁹

⁷ Clare Mc Andrew, ‘The art market. ed. 2021. Art Basil and UBS. Switzerland’ (2021) <<https://www.artbasel.com/about/initiatives/the-art-market>> accessed 19 August 2021.

⁸ Elena Sidorova, ‘The Cyber Turn of the Contemporary Art Market’ [2019] 8(3) *Art Markets and Digital Histories* <<https://doi.org/10.3390/arts8030084>> accessed 20 August 2021.

⁹ Ílina C. M. Pontes, ‘Compliance e mercado da arte: uma análise do sistema de regulação multifacetado em transações de obras artísticas’ (Dissertation, Universidade Federal da Paraíba 2019).

The most common markets are the primary and secondary, in which the classic and contemporary works are the most competitive, and the rest being of little importance.

The primary market is typically characterised by artists who produce new works of art, presenting them to dealers or commercial art galleries who sell their works through their businesses or at art fairs receiving a percentage of each sale as compensation for their work.¹⁰ It is a market that consists of the initial contact between the artistic object and commercial exchanges, that is, the first time it will be marketed. In it you can find, basically, art fairs, artists' studios,¹¹ some collectors and art galleries.¹² In addition, newer works by renowned artists or works by younger artists can be found in this market.

The secondary market is generated from the negotiation of an existing work that has been in circulation for some time and its activity is exclusively focused on the resale of works of art. It is a market basically represented by auction houses.¹³

This market classification, however, practically refers to those works better known as the visual arts. Considering, however, that the art encompasses all human creations and that is quite extensive.

In this sense, the report released by the United Nations Conference on Trade and Development in 2019, finds that the trade in creative products¹⁴ such as crafts, audiovisual, design (fashion, architecture, jewelry), performance (music, performing arts), publishing (books, newspapers, magazines), visual arts (antiques, painting, photography, sculpture) had consistent performances between 2002 and 2015, with an average growth rate of around 7% per year. In terms of monetary revenue it was registered the figures of US\$ 208 billion and US\$ 509 billion, respectively, in this period, the report also states that the creative economy can contribute substantially to the GDP of global trade, mainly by sharing various sectors and the adoption of technological innovations, which increase the quantity and quality of products, boosting demand.

Market size is generally measured by sales volume. Although the shared data is incomplete, it is possible to get a rough idea of the mechanisms. Most sales occur through public auctions, where large auction houses publish their movement, however, there are others that still persist in the practice of obscuring sales results.¹⁵ It should also

¹⁰ Margherita Villa, 'Blockchain technology and the art market: discrepancies between the reception and the application of the technology by the art market its stakeholders' (Dissertation Master, Erasmus University Rotterdam 2019).

¹¹ The main international art fairs are the ArtBasel; FiacParis; Scope Art Show; EnterArt Fair; Pinta Miami; Frieze.

¹² As the main international art galleries can be mentioned the Sotheby's; David Zwirner; Balice Herting; Galerie Perrotin; Houser & Wirth; Pace Gallery; Victoria Miro; Gagosianme Ruth Benzacar. They are all located in the United States, Europe and Asia.

¹³ The main international auction houses are the Sotheby's; Christie's; Bonhams; Phillips de Pury & Company; Dorotheum.

¹⁴ UNCTAD, 'Creative Economy Outlook: trends in international trade in creative industries- 2002-2015' <<https://unctad.org/webflyer/creative-economy-outlook-trends-international-trade-creative-industries>> accessed 19 August 2021.

¹⁵ Clare Mc Andrew, 'The art market. ed. 2021. Art Basil and UBS. Switzerland' [2021] 169. <<https://www.artbasel.com/about/initiatives/the-art-market>> accessed 19 August 2021.

be noted that merchants' operations within collectors are not available, leading to the conclusion that the topic still lack importance in international economic overview.¹⁶

Even with this phenomenon of unreliable data, it is observed that the art market reaches impressive figures. The most recent Art Market report, from 2021,¹⁷ shows that, despite the retraction observed in relation to 2019, global sales of art and antiques¹⁸ reached about US\$50.1 billion in 2020. This financial movement is dominated by the big three axes: The United States, the United Kingdom and Greater China, which together represent 82% of global sales. Individually, the United States leads with \$21.3 billion, followed by Greater China, with \$10.0 billion, and finally the United Kingdom, with \$9.9 billion. But, based on the number of transactions, it is necessary to consider the leadership of Greater China, which, although the works reach medium and low prices at auctions, its movement is quite expressive, registering the revenue of several multimillions lots sold in Hong Kong and Beijing in the year of 2020.¹⁹

In terms of product quality, in 2020, the largest sector, with 55% of the business carried out, is made up of Contemporary Art and Modern Art, which together accounted for 81% of sales value.²⁰

As a result of the global art fairs that had been planned for 2020, due to the health pandemic, 61% were canceled as face-to-face events. However, 62% of organizers offered an online viewing room or a digital version of their fairs, which in terms of monetary volumes represented only 13% of total sales.²¹

In other sectors, online sales also reached records: participation in e-commerce²² with 25% in 2020, against 9% in 2019; and fine art auction,²³ with a participation of 22% in 2020, which represents the double of the previous year.²⁴

The use of digital strategies was especially successful, bringing in new buyers to the auction industry, a trend that spread throughout 2020. As digital transformations continued, traders, auctioneers, dealers, and other categories invested heavily in new

¹⁶ Earp Fabio Sá and KORNIS George, 'O mercado de artes visuais: algumas características. Políticas Culturais: pesquisa e formação' (2019) IC 221.

¹⁷ Clare Mc Andrew, 'The art market. ed. 2021. Art Basil and UBS. Switzerland' [2021] 17. <<https://www.artbasel.com/about/initiatives/the-art-market>> accessed 19 August 2021.

¹⁸ The global arts and antiques market comprise approximately 305,250 companies, generating direct jobs for around 2.9 million people. Clare Mc Andrew, 'The art market. ed. 2021. Art Basil and UBS. Switzerland' [2021] 23. <<https://www.artbasel.com/about/initiatives/the-art-market>> accessed 19 August 2021.

¹⁹ *ibid* 107.

²⁰ *ibid* 19.

²¹ *ibid* 20.

²² Online markets are digital platforms on websites, or social media, that ensure direct communication between artists, dealers and potential art buyers. Elena Sidorova, 'The Cyber Turn of the Contemporary Art Market' [2019] Art Markets and Digital Histories <<https://doi.org/10.3390/arts8030084>> accessed 20 August 2021.

²³ *Ibid*. Auctions offer a way to bid in the comfort of your own home, avoiding social barriers, where bidders boast certain luxuries and wealth.

²⁴ Clare Mc Andrew, 'The art market. ed. 2021. Art Basil and UBS. Switzerland' [2021] 21. <<https://www.artbasel.com/about/initiatives/the-art-market>> accessed 19 August 2021.

technologies, reaching \$3.5 billions.²⁵ Although the improvement of technologies is crucial to maintain and increase sales, its development involves challenges. There are also those who understand that e-commerce does not allow, for example, to inspect the work of art before the purchase, causing difficulty in building consumer confidence, or establishing the seller's reputation.²⁶ Despite this imperfection, the online art market nurtures prospects for future development, expecting a significant increase in the coming years. The cybernetic turn has an influence not only on the modality of marketing and valuing art, but also on the gradual diversification of participants, with a potential increase in customers and future buyers.

3 Blockchain and NFT technologies

Since the waves of technological innovation emerged, they have not only streamlined the exchange of information but mostly have structurally changed the form of social and commercial relationships. Digital networks with a global reach have promoted changes within the functionalities in both public and private spheres, causing the rise of business models, the modification of work organisation, new forms of entertainment, potentialised the trend of sharing services and many other. However, the model was based on the dependence of central figure that works as an intermediary operator, generating a certain distrust in the operations among simple users²⁷.

The blockchain technology surges to invert the centralised logic to decentralised, in order to guarantee trust in a distributed way²⁸. Blockchain was originally conceived as a technology applied in the creation of Bitcoin. Its basic essence is the structure of a chain of blocks, and the blockchain can be understood as a "decentralised network of electronic terminals (computers) distributed around the world and interconnected by the internet"²⁹. Much like the internet, the blockchain technology is free and open; it does not belong to anyone and is considered a foundational technology³⁰. As they have generative properties, they don't depend on the figure of a centralised server, allowing users, based on a trustworthy protocol, to promote data transfer. It is a peer-to-peer

²⁵ Ibid 23.

²⁶ Elena Sidorova, 'The Cyber Turn of the Contemporary Art Market' [2019] *Art Markets and Digital Histories* <<https://doi.org/10.3390/arts8030084>> accessed 20 August 2021.

²⁷ Ferreira Ana F. C., 'O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital' (Dissertation, Universidade Católica de Pernambuco 2020).

²⁸ Ibid.

²⁹ Rennan Thamay and Mauricio Tamer, *Provas no Direito Digital* (1 edn, Thomson Reuters/Revista dos Tribunais 2020) 171. According to these authors, the Internet is a system consisting of the set of logical protocols, structured on a world scale for public and unrestricted use, with the purpose of enabling the communication of data between terminals through different networks. Thus, any computer, electronic device, or computer structure, such as terminals, can be connected for the transmission of information. The blockchain network is also a network that takes advantage of this technical structure to promote specific exchange of information, but with its own dynamics.

³⁰ Ana F. C. Ferreira, 'O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital' (Dissertation, Universidade Católica de Pernambuco 2020).

network, in which each user, voluntarily, makes their device available in favor of this decentralised mesh, which has a double function: receiver and server, and each device represents a node³¹.

In Italy, blockchain has been legislated under the “Decreto legge n° 135 of 2018.”³² Being defined in its article 8-ter as “technology based in distributed datacenters, the technologies and informatic protocols that are used to keep and register data in a shared datacenter, distributed, reproduceable, accessible simultaneously, architecturally decentralised under cryptographic methods, permitting the registration, validation, update and archive of data in a clear way, protected by an unchangeable and verifiable cryptography by each user.”

The blockchain system can support three modalities: the public, or without permission; the private, or authorised; and the hybrid. The public network admits the entry of any individual, without the need to obtain permission from other users; the private network limits members and requires access authorisation, in which case an owner or management entity is required.³³

Formally a blockchain is a distributed and synchronised ledger.³⁴ It consists of a digital database, maintained by algorithm, and stored in several nodes (computers), so that each one can store a complete database.³⁵ The element that characterizes this technology is the block of chain (data container). Each block has a fingerprint called a hash³⁶ that is used to certify the block’s information content. Blocks are concatenated chronologically into a chain, adding to each block, which is assigned a new hash including a field with the hash of the previous block.³⁷

Blockchain technology uses asymmetric cryptography (also known as public key cryptography) to implement digital transaction signatures. Each transaction is signed with the sender’s private key, and anyone can verify the transaction’s authenticity using the sender’s public key. Asymmetric encryption allows a reliable exchange between users who don’t trust each other. Thus, when the ledger is distributed over a peer-to-

³¹ Rennan Thamay and Mauricio Tamer, *Provas no Direito Digital* (1 edn, Thomson Reuters/Revista dos Tribunais 2020) 172.

³² Converted, with amendments, in law No. 12 of 11 February 2019 and published in ‘Gazzetta Ufficiale’ n. 36 in 12 February 2019.

³³ Ana F. C. Ferreira, ‘O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital’ (Dissertation, Universidade Católica de Pernambuco 2020).

³⁴ Massimo Franceschet, ‘HITS hits art’ [2021] 1 ARXIV 1 <<https://arxiv.org/abs/1907.07758>> accessed 16 out 2021.

³⁵ Ana F. C. Ferreira, ‘O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital’ (Dissertation, Universidade Católica de Pernambuco 2020).

³⁶ *Hash is an alphanumeric sequence generated after a mathematical operation is deciphered. It’s basically small computer programs that transform any type of data into fixed-size bits.* Massimo Franceschet, ‘HITS hits art’ [2021] 1 ARXIV 1 <<https://arxiv.org/abs/1907.07758>> accessed 16 out 2021.

³⁷ Ana F. C. Ferreira, ‘O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital’ (Dissertation, Universidade Católica de Pernambuco 2020).

peer network, each node in the network has a copy of the entire blockchain, making it difficult to tamper with the information.³⁸

Any change in any transaction will completely change the hash of that block and the following ones, causing inconsistencies that compromise the entire system.³⁹

Recently, the NFTs - Non-fungible-token in blockchain pattern was introduced, with great repercussion in the art market, working through interlaced data chain.⁴⁰ It consists of a special typology of encrypted token,⁴¹ whose main characteristic is that it cannot be exchanged; it is not exchangeable or interchangeable.⁴² The simple copy and paste mechanism can be done on the internet in general, which affects usage rights with effects on the economic value of photos or other works of art on the internet. With this technology, clandestine copying and counterfeiting problems can be resolved. Furthermore this new technological asset, especially those used for an artistic nature, become digitally rare precisely because they are not fungible.⁴³

The usefulness of the NFT in works of art was demonstrated in an unusual way when executing the “Burned Picasso” project. The executers of this “transformation” justified their project stating that by burning the work, and printing it on an NFT, it becomes a store of value, translating the origin of the piece from the physical to the web 3.0 version.⁴⁴ Critics of the artistic sector were abundant. Some understood the meaning of this action, although experimental, as a form of preservation of a unique and unchanging piece that is going to be forever in the blockchain bringing the most

³⁸ Massimo Franceschet, ‘HITS hits art’ (2021) 1 ARXIV 1 <<https://arxiv.org/abs/1907.07758>> accessed 16 out 2021.

³⁹ Ana F. C. Ferreira, ‘O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital’ (Dissertation, Universidade Católica de Pernambuco 2020).

⁴⁰ Kochtkova Marina, ‘Blockchain in the art Market: opportunities and challenges’ (Bachelor’s thesis, University of Applied Sciences 2020).

⁴¹ It can be considered token, any hardware capable of generating and storing the encrypted keys that will compose the digital certificates. Represents a token the registration of an asset in digital format. Cf. Proto Nathália de C. G., ‘Da lex mercatória à lex cryptographia: uma análise jurídica da regulamentação global do blockchain e os seus impactos no comércio internacional’ (Dissertation, Universidade Federal de Pernambuco 2020). According to this author, tokens can be presented in four types: payment, those intended to be used as monetary units and means of payment; utilities, those designed to guarantee access to goods or services contained in digital platforms; asset tokens, which represent credit rights or equity interests; and hybrid tokens, those that are part utilities and part assets or payments. The non-fungible token is a kind of encrypted token that works under Ethereum base, and that can represent anything as unique.

⁴² Simone Morabito, ‘Profili giuridici degli NFT (Non fungible tokens) tra arte e blockchain in Italia’ (*Business Jus website*, 2021) <<https://www.businessjus.com/wp-content/uploads/2021/01/Profili-giuridici-degli-NFT.-Tra-Arte-e-blockchain.pdf>> accessed 19 August 2021.

⁴³ Ibid.

⁴⁴ Silva Aila Regina da, ‘Um quadro de Picasso encriptado: sobre NFT e desmaterialização’ (*JORNAL DA USP*, 30/08/2021) <<https://jornal.usp.br/artigos/um-quadro-de-picasso-encriptado-sobre-nft-e-desmaterializacao/>> accessed 19 August 2021. According to the authors, the work called “Femur V”, was purchased at a Christie’s auction, by the Fractal Studios group and registered at the Unique One Art Marketplace. Once tokenised, the original work was literally burned. Thus, two NFTs emerged, one called “The Burned Picasso 1”, corresponding to the original work and the other, called “The Burned Picasso 2”, corresponding to the burnt remains of the work, both registered in the Unique One Art Marketplace.

influential artist of all time into the new era of art.⁴⁵ But there are those who are against it, based on the notion that by erasing from reality and recreating digital reality, even if perpetuated by pixels, it removes from the work the fundamental and essential aspects of the piece as visualised by the author, in the case such as paper and paint. On the other hand, the effect of dematerialisation, in addition to giving the work another meaning, totally modifying the old paradigm, makes the work's value increase considerably,⁴⁶ leading the artistic community to reflect on the revelation of the essence of the creative market and that the content of a work is not the matter in itself, but the idea, that no extinguishing action is capable of destroying it.

Anyway, in 2018, the use of blockchain in the art market, had a remarkable increase, there were developments of experimental software, with special emphasis on the contemporary art market. These software were presented in forums, fairs and auctions, encouraging discussion on the adoption of this technology. Ideas from different artists were demonstrated at the time, and all transactions took place exclusively with the use of cryptocurrency.⁴⁷

The Token-Art system has also been useful in the fractionation of ownership of the art, offering a portion to each interested party, resulting in greater compensation in financial terms, both for the selling company, and for the owner of the work.⁴⁸

The NFT is also used as an important factor of "digital scarcity:"⁴⁹ that is, the idea is to make a scarce digital archive, associating it to a non-fungible token, because the artwork, in this case, would become unique. And, in the art market, the characteristic of uniqueness has a fundamental representativeness in its appreciation.

The NFT works together with the smart contract, as they are much more functional than those traditionally printed on paper. But conceptualising it is not easy. The literature on the subject establishes different concepts, the following can be cited: "agreement in a self-executed and self-implemented digital format;"⁵⁰ "user-defined programs that specify rules governing transactions and applied by a network of peers;"⁵¹

⁴⁵ <<https://www.accesswire.com/653023/The-Burned-Picasso-NFT-to-Digitally-Preserve-Artistic-Legacy>> accessed 20 August 2022.

⁴⁶ Silva Aila Regina da, 'Um quadro de Picasso encriptado: sobre NFT e desmaterialização' (*JORNAL DA USP*, 30/08/2021) <<https://jornal.usp.br/artigos/um-quadro-de-picasso-encriptado-sobre-nft-e-desmaterializacao/>> accessed 19 August 2021.

⁴⁷ Sidorova Elena, 'The Cyber Turn of the Contemporary Art Market' [2019] 8(3) *Art Markets and Digital Histories* <<https://doi.org/10.3390/arts8030084>> accessed 20 August 2021.

⁴⁸ Mc Andrew, Clare, 'The art market. ed. 2021. Art Basil and UBS. Switzerland' [2021]. <<https://www.artbasel.com/about/initiatives/the-art-market>> accessed 19 August 2021.

⁴⁹ Massimo Franceschet, 'HITS hits art' (2021) 1 *ARXIV* 1 <<https://arxiv.org/abs/1907.07758>> accessed 16 out 2021.

⁵⁰ Werbach Kevin and Nicolas Cornell, 'Contracts ex machina' [2017] 67(2) *Duke Law Journal* 320 <<https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=3913&context=dlj>> accessed 19 August 2021.

⁵¹ Demolino Kevin and others, *Step by Step Towards Creating a Safe Smart Contract: Lessons and Insights from a Cryptocurrency Lab.* (IFCA, 2015).

“agreements in which the execution is automated by computer;”⁵² “programs that perform a particular operation under certain conditions that operate automatically based on pre-established functions;”⁵³ “a promise, or group of them, crafted on a blockchain platform and executed by a computer system;”⁵⁴ “are legally binding contracts.”⁵⁵

In Italy, looking at the “Legge 12, del 11 febbraio 2019, comma 2, art. 8-ter” we can find the following definition about smart contracts: “A smart contract is a computer program that operates on technologies based on distributed registers and whose execution automatically binds two or more parties based on predefined effects. Smart contracts satisfy the requirement of the written form subject to computer identification of the interested parties, through a process having the requirements set by the “*Agenzia per l’Italia digitale*” with guidelines to be adopted within ninety days from the date of entry into force of the law converting this decree”.

It is observed that there are different points of view in the art community. It may be possible to differentiate between these concepts: on the one hand, there are the technicians, whose nature would be code-programmatic; on the other, jurists, whose nature would be contractual. The first ones are based on the premise that the “code is law,”⁵⁶ an idea that expresses the operation without a legal regulation and interpretation; in other words, its proponents argue that smart contracts, especially when stored and executed in a blockchain, do not require any legal system to operate.⁵⁷ However, this position is heavily criticised from a legal point of view. There is no doubt that smart contracts operate and execute automatically, however, there is no way of knowing whether the obligation of the contract was validly created, or even if the parties agreed to make the contract.⁵⁸ The literal and reductionist interpretation has also been criticised: the expression “intelligent” attached to the contract does not mean

⁵² Max Raskin, ‘The Law and Legality of Smart Contracts’ [2017] 304 *Georgetown Law Technology Review* <<http://dx.doi.org/10.2139/ssrn.2842258>> accessed 19 August 2021.

⁵³ Simone Morabito, ‘Profili giuridici degli NFT (Non fungible tokens) tra arte e blockchain in Italia’ (*Business Jus website*, 2021) <<https://www.businessjus.com/wp-content/uploads/2021/01/Profili-giuridici-degli-NFT.-Tra-Arte-e-blockchain.pdf>> accessed 19 August 2021.

⁵⁴ Idan Shkaltz, ‘Smart contracts or Smart Escrows? Legal analysis of blockchain based Smart Contract’ (DPhil thesis, Harvard Law School, 2018)

⁵⁵ A Papantoniou, ‘Smart contracts in the new era of contract law’ [2020] 4(1) *Digital Law Journal* <<https://doi.org/10.38044/2686-9136-2020-1-4-8-24>> accessed 19 August 2021.

⁵⁶ Expression introduced by Lessig [1999], ‘Commelles, Cristina Argelich ‘Smart contracts o code is law: soluciones legales para la robotización contractual’ (2020) 2 *InDre* 1.

⁵⁷ Giesela Ruhl, ‘Smart (Legal) Contracts, or: Which (Contract) Law for Smart Contracts?’ [2020] 4(0) *Benedetta Cappiello & Gherardo Carullo* (eds), *Blockchain, Law and Governance* <<https://ssrn.com/abstract=3552004>> accessed 20 August 2021.

⁵⁸ *Ibid.*

autonomous robot performance, but programming, so that calling it “intelligent contract” is too concise to express the function of these contracts.⁵⁹

Such contracts, however, inseparable from the NFT file, can be carried out automatically, so that the entire transaction is registered in the blockchain, providing protection and security in the transaction.⁶⁰

The main attributes highlighted by smart contracts are autonomy, decentralisation, self-sufficiency and security. Autonomy refers to the needlessness for any further participation by the contracting party in the process, since the system runs itself, when its conditions are satisfied and informed to the network; decentralisation refers to the inexistence of a central authority or server to guarantee its existence and authenticity, since the data is distributed over several network points; self-sufficiency concerns the capacity of these contracts to adopt means to allow greater storage capacity, not only in collecting money, but also in carrying out transactions; as for security, it is directly linked to the blockchain system, which operates as a ledger and creates consensus and trust in the direct communication between two or more parties, without the intermediation of third parties, providing greater privacy to those involved.⁶¹

To mention some, new buyers are not used to the operational form of auctions, there are diverse contractual aspects, that might interfere with structuring of incidental fees that if they are not properly managed, can lead to procedural and legal problems, reducing sales and increasing defaults.⁶² There are also those who understand that e-commerce does not allow, for example, to inspect the work of art before the purchase, causing difficulty in building consumer confidence, or establishing the seller’s reputation.⁶³ Despite this imperfection, the online art market nurtures prospects for future development, expecting a significant increase in the coming years. The cybernetic turn has an influence not only on the modality of marketing and valuing art, but also on the gradual diversification of participants, with a potential increase in customers and future buyers.

⁵⁹ Commelles, Cristina Argelich ‘Smart contracts o code is law: soluciones legales para la robotización contractual’ (2020) 2 InDre 1.

⁶⁰ Cavalcanti Mariana O.M. and Nobrega Marcos, Smart contracts ou “contratos inteligentes”: o direito na era da blockchain (2th edn, CERS 2020).

⁶¹ Mariana O.M. Cavalcanti and Marcos Nobrega, Smart contracts ou “contratos inteligentes”: o direito na era da blockchain (2th edn, CERS 2020). Ana F. C. Ferreira, ‘O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital’ (Dissertation, Universidade Católica de Pernambuco 2020).

Nathália de C. G. Proto, ‘Da lex mercatória à lex cryptographia: uma análise jurídica da regulamentação global do blockchain e os seus impactos no comércio internacional’ (Dissertation, Universidade Federal de Pernambuco 2020).

⁶² Ibid 168

⁶³ Elena Sidorova, ‘The Cyber Turn of the Contemporary Art Market’ [2019] 8(3) Art Markets and Digital Histories <<https://doi.org/10.3390/arts8030084>> accessed 20 August 2021.

4 Legal implications

From the blockchain technology perspective there are still many doubts and questions, especially regarding legal implications of NFT and smart contracts. It is required new theoretical approaches and new hermeneutics that adjusts itself to the peculiarities of digital facts. One of the main legal concerns is the language used by digital media, that is, algorithms. This “language” is not capable of formulating value of judgment⁶⁴ like humans do organically, demanding new postulates and paradigms to be studied and adopted in legal theory. It would be impossible, for example, to include clauses such as good faith, reasonableness, or fairness⁶⁵ to be measured, balanced and applied to each concrete case. In this universe, it will be necessary to overcome the existing dichotomy between digital language characterised by precision and certainty, and, the legal language whose concepts are essentially indeterminate and imprecise.

In the cyber phenomenon linked to the international art trade, there are undoubtedly advantages in applying the blockchain in art market operations, mainly to improve the authenticity and provenance of works of art, as well as to protect the privacy of collectors and the potential for product traceability. But two aspects are worth mentioning, given their implication in the legal world: the contractual effects and property rights.

4.1 Contractual Effects

The function of a traditional contract is to acquire, terminate or modify the parties’ rights and obligations through a legal bond. In this sense, any agreement of will, including smart contracts, would, in the legal sense, be a contract, insofar as they operate as voluntary mechanisms that change the rights and duties of the parties.⁶⁶

When it comes to international art trade, it is important to point out that each international legal system require different elements for the formation of the contract. If the system is common law, it constitutes a more open premise, based more on reason and contractual freedom; if it is civil law, the system is more closed, with greater rigidity and based on the law. Even under the common law aspect, the consideration of a legally binding contract is required.⁶⁷ Although there is still a lot of debate, in the United States, for example, for Smart Contracts to be considered a contract, it must be a legally

⁶⁴ Mariana O.M. Cavalcanti and Marcos Nobrega, Smart contracts ou “contratos inteligentes”: o direito na era da blockchain (2th edn, CERS 2020).

⁶⁵ Valentina Bellomia, ‘Il contratto intelligente: questioni di diritto civile. *Judicium*: il processo civile in Italia e in Europa’ (2020) <<https://www.judicium.it/wp-content/uploads/2020/12/Valentina-Bellomia>> accessed 19 ago 2021.

⁶⁶ A Papantoniou, ‘Smart contracts in the new era of contract law’ [2020] 4(1) Digital Law Journal 8-24 <<https://doi.org/10.38044/2686-9136-2020-1-4-8-24>> accessed 19 august 2021.

⁶⁷ Ibid.

questionable agreement,⁶⁸ so that smart contracts would be considered, not exactly contracts, but “gentlemen’s agreement.”⁶⁹

In general, for contracts to be effective, it is necessary an agreement of will, with an objective verification, and the will must be manifested in actions or demonstrated through a declaration; it is also necessary for the instrument to have parties with legal capacity, the object to be lawful and that there is a motivation.⁷⁰ Regarding the manifestation of the will, according to some authors, the simple proposal is not representative of the will to contract, if there is no counterpart of acceptance; when the two parts fit together, the contractual link is born, not when the contract is loaded and executed in the blockchain.⁷¹ According to Bellomia,⁷² in computer language, execution, means beginning of the program on the computer and this is the moment that will definitively establish the link between the parties, so until then, there would not be a contract with force of law. Thus, the use of the smart Contract is not compatible with the will to perform the contract other than the automatically built instrument.

In these situations we can leverage that the legal sector conjecture the idea that in smart contracts there is an “anticipation of legal relations.”⁷³ This means that, while in the traditional contract the pre-contractual phase, an opportunity in which the parties are in negotiations, analyzing the preliminary negotiations and the expectations of the parties and, therefore, the figure of the legal relationship is still absent, being almost a unilateral contract, where all of the clauses are predefined, in the smart contract this information is already codified and considered, since the object of the contract is connected to the digital network, although the improvement of the contract occurs at the moment in that the parties express their consent.⁷⁴ It is also necessary to consider that in relation to consent, the smart contract takes place immediately just directly in the personalisation of a contract or in the adherence to a predisposition which can give rise to the defects of consent.⁷⁵

Another highly discussed aspect is the immutable nature of smart contracts, as once introduced and activated, it cannot be modified, and it will be executed automatically.

⁶⁸ Kevin Werbach and Nicolas Cornell, ‘Contracts ex machina’ [2017] 67(2) Duke Law Journal <<https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=3913&context=dlj>> accessed 19 August 2021.

⁶⁹ Mariana O.M. Calvacanti and Nobrega Marcos, ‘Smart contracts ou “contratos inteligentes”: o direito na era da blockchain’ (2th edn, CERS 2020).

⁷⁰ Alberto Castellano Pérez, ‘Aproximaciones técnicas y jurídicas a la figura de los smart contractos em el odonamiento jurídico español’ (Dissertation, University of León 2019).

⁷¹ Marta Marchesin, ‘Gli smart contracts: profili giuridici’ (Bachelor’s thesis, University of Padova 2020).

⁷² Valentina Bellomia, ‘Il contratto intelligente: questioni di diritto civile. *Judicium*: il processo civile in Italia e in Europa’ (2020) <<https://www.judicium.it/wp-content/uploads/2020/12/Valentina-Bellomia>> accessed 19 ago 2021.

⁷³ Junior José L. de M. F. and Roth Gabriela, ‘Como a utilização do blockchain pode afetar institutos jurídicos tradicionais’ (2019) 14 RJMPC 39.

⁷⁴ Commelles, Cristina Argelich ‘Smart contracts o code is law: soluciones legales para la robotización contractual’ (2020) 2 InDre 1.

⁷⁵ Ibid.

This situation can bring legal problems, considering that not all unpredictable events could be established *ex ante* in smart contracts, which are possibly correctable in traditional contracts. Thus, a smart contract may not be desirable, if it “differs from the intentions of the parties”, even more when such codes are not written by the parties themselves.⁷⁶ In contractual law thesis it is applicable the *pacta sunt servanda* theory as the foundation of the binding force of contracts, although its proposition was mitigated over time by the principle of *rebus sic stantibus*, with the objective of protecting contracting parties against unforeseen and unexpected changes, relativising the absolute conception of the first brocade. However, when it comes to a smart contract, the applicability of this principle would be impossible. In such a way, the inflexibility of the smart contract would be a difficult problem to be solved, especially in the universe of business relationships, where the modification of the fulfillment of obligations is an intrinsic characteristic.⁷⁷ The immutability of these contracts can bring another consequence: the impossibility of termination.⁷⁸

All these main contractual effects require from the legal order new methods of hermeneutics, a new way of understanding digital phenomena, greater interpretive flexibility, to change the scope and applicability of current legal institutes.

4.2 Effects on property rights

It is known that works of art are generally protected by copyright. In addition, works of art may also be subjected to ownership and private property rights. On this occasion, a legal analysis can be carried out about the main effects that can be observed in these institutes in the universe of the use of blockchain technology and the NFT in the aspect of international trade. Intellectual property rights will be referred to as copyright, and private property will be reference for ownership and real state proprietorship.

⁷⁶ A Papantoniou, ‘Smart contracts in the new era of contract law’ [2020] 4(1) Digital Law Journal <<https://doi.org/10.38044/2686-9136-2020-1-4-8-24>> accessed 19 august 2021

⁷⁷ Uster João Lucas Danbrosi. ‘Contratos inteligentes (smart contracts): possibilidade e desafios no ordenamento jurídico brasileiro’ (Dissertation, Universidade Federal do Rio Grande do Sul 2020).

Rocha Debora C. de C., ‘Smart contracts e the code is law: a problemática frente à base principiológica contratual contemporânea’ (2020) 32 Percurso 113-137.

⁷⁸ Alexander Savelyev, ‘Contract law 20: ‘Smart’ contracts as the beginning of the end of classic contract law’ [2017] 26(2) Information & Communications Technology Law <<https://doi.org/10.1080/13600834.2017.1301036>> accessed 20 August 2021.

4.2.1 Copyright

The copyright, is considered as an inherent right to the author of the product that results from his intellectual creation, contains two aspects of rights: personal and patrimonial.

The personal rights under the copyright correspond to the protection of the creator's interests within the person's work aspects, that being the object that constitutes whether a representation, or an externalisation of the idea of the author. Therefore copyright constitutes the ownership power over an intellectual good (*jus is re intellectualis*), or a special faculty.⁷⁹ It is the creation of the work that guarantees protection. In this sense there is also reference in doctrinal studies as "paternity law" of a work,⁸⁰ to which the law attributes the legitimacy to plead their rights as a true author, preventing third parties from misappropriating themselves.

On the other hand, the rights of a patrimonial nature are the prerogatives that are attributable to the creator, as he is also the owner of the work, having the power to dispose of it in the way that best suits him, or to explore it with the objective of obtaining profit.⁸¹

In this way, copyrights refer both to protection under the personal and patrimonial aspects, even though they are independent from each other, even considered by some scholars as exclusive rights, since it is related to the monopoly in the exercise of economic activity.⁸² It is an institute of significant importance in that it repays and gives value to the individual's creative work, the absence of which would limit their protection, probably only regarding unfair competition.⁸³

At an international level, attention to copyright has two legitimate interests: on the one hand, the interest of the author, who wants not only the protection of his rights, but also that his work be disclosed for the knowledge of all; on the other, the interest of society, embodied in free access to cultural goods and information.⁸⁴ There are then two interests: author's rights and the right to culture, both considered fundamental rights by almost all national or international legal systems. At first sight, such interests seem antagonistic, but they can be considered complementary, since the author's right, as long as it is duly authorised and/or remunerated, would not represent major problems

⁷⁹ Sergio Branco, 'A natureza jurídica dos direitos autorais' (2013) 2 RC.

⁸⁰ Ibid.

⁸¹ Ana F. C. Ferreira, 'O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital' (Dissertation, Universidade Católica de Pernambuco 2020).

⁸² Ibid.

⁸³ João G. T. Fernandes, 'Os desafios da tecnologia blockchain no direito da propriedade intelectual. (Dissertation, Universidade Católica Portuguesa 2019).

⁸⁴ Messina Elena, 'La tutela del diritto d'autore alla luce della direttiva 2019/790 dell'unione europea: la ricaduta di responsabilità sugli intermediari per i contenuti generati dagli utenti' (Bachelor's thesis, University LUISS Guido Carli 2020).

in the use of the work. However, it is possible to obtain a solution, even in case of conflicts, with the application of the balancing system between the author's interests that need to be protected and the adequate means to grant this protection, and the form necessary use to satisfy the public interests.

Evidently, for the copyright to be attributed to its owner, conditions and criteria are imposed and must be fulfilled according to the pertinent legislation, when the owner is doing the registration of the work. Impositions must meet a reasonable balance between the legitimate interest of the author, who needs to safeguard his idea, but cannot imply a complete denial of access to the product when considered in the public interest.⁸⁵ Furthermore the bureaucratic procedure that authors must undergo to register their creation for many times may not effectively meet their interests.⁸⁶

With Internet's expansion and facilitating instruments such as "copy and paste", the respect for copyright is even more important, because anyone with a minimum of knowledge in computer daily usage can easily change, modify, reproduce and disseminate worldwide any content protected by copyright, creating a lot of legal uncertainty among authors. The emerge of blockchain technology represents, therefore, a solution regarding the security and helps avoid the misuse of works that are subject to copyright protection.

As for the works of art registration through blockchain technology, specialised literature evaluates positively, contributing not only to protect the originality of a work,⁸⁷ but also to mitigate problems such as the lack of transparency of the information underlying the work.⁸⁸ In addition, the operational decentralisation of this technology guarantees safer registration than the one carried out by the official government agency;⁸⁹ while it also allows the registration of other rights added to the copyright, such as the terms or conditions of use of the work, recognising the possibility for the authors to control themselves the access to their works.⁹⁰ Since the fixation of the permanent and inviolable trademark would allow not only the other blocks to identify that the work is protected by the author's rights, but it will also possibly facilitate the proof of ownership of the right to the work in any conflicts.

⁸⁵ João G. T. Fernandes, 'Os desafios da tecnologia blockchain no direito da propriedade intelectual. (Dissertation, Universidade Católica Portuguesa 2019).

⁸⁶ Junior José L. de M. F. and Roth Gabriela, 'Como a utilização do blockchain pode afetar institutos jurídicos tradicionais' (2019) 14 RJMPC 39.

⁸⁷ Ibid.

⁸⁸ João G. T. Fernandes, 'Os desafios da tecnologia blockchain no direito da propriedade intelectual. (Dissertation, Universidade Católica Portuguesa 2019).

⁸⁹ Junior José L. de M. F. and Roth Gabriela, 'Como a utilização do blockchain pode afetar institutos jurídicos tradicionais' (2019) 14 RJMPC 39.

⁹⁰ Elena Messina, 'La tutela del diritto d'autore alla luce della direttiva 2019/790 dell'Unione europea: la ricaduta di responsabilità sugli intermediari per i contenuti generati degli utenti' (Bachelor's thesis, University LUISS Guido Carli 2020).

The blockchain system is considered to be an important mechanism to detect infringement of a copyright, for example, if a certain work in digital format is sold on the secondary market without authorisation of the respective right holder,⁹¹ it's going to be easier to solve because the work inserted in the blockchain is associated with a hash and any change to the content trackable facilitating the verification of the work's authenticity.⁹²

It's useful to elucidate that the author's rights, in general, are limited in time. This means that after a time period determined by the relevant legislation, copyrights are no longer exclusive, passing to the public domain.

Copyright, in fact, can be transferred even to different people. The situation analyzed by Matulionyte⁹³ in this sense is the tokenisation of the copyright sold/assigned to different owners, there being, therefore, the co-ownership of copyright over a work of art. This means that each of the copyright holders would need everyone's prior permission each time they wanted to use the copyrighted work. Hypothetically, the author by stating the lease agreement must clearly provide for the parts the rights that each has listing the related rights can be exercised, what obligations exist, what responsibilities, as well as the sharing of the profits, in order to prevent the misuse of copyrights, as well as other violations that could eventually occur.

Another aspect to be analyzed is the immutability of the blockchain network contrasts with the dynamism of copyright, which is changeable.

One of the great difficulties in the efficient protection of copyright in the digital age is the insufficiency of international protection legislation, although there is a certain degree of multilateral coordination within delimited systems such as the European community, in general the application system is still limited to the states domestically.⁹⁴ This is because most of the legislation applicable to copyright is still being used in the domestic sphere, arising from the internal legal system of each State. However, this panorama must change and be more comprehensive, given the significant expansion of international trade, especially when it comes to trade in works of art, but also within the music and movies industry for example.

Without a doubt, technology has changed the basis of copyright, causing changes that not only require updated legislation, but also the legal understanding of copyright protection, following the evolution of the digital age. Although the legal community is

⁹¹ João G. T. Fernandes, 'Os desafios da tecnologia blockchain no direito da propriedade intelectual. (Dissertation, Universidade Católica Portuguesa 2019). Although this author also argues that the blockchain would not allow the authors to control works in digital format, in order to disregard the application of the principle in the secondary market.

⁹² Ibid.

⁹³ Rita Matulionyte, 'Can copyright be tokenised?' [2019] EIPR 12.

⁹⁴ Pedro Ivo Ribeiro Diniz, 'A tutela insuficiente do sistema internacional de proteção aos direitos autorais na era digital' (Dissertation, Universidade Federal de Minas Gerais 2010).

currently working on the subject, there are still many doubts, divergences and obstacles to be overcome for the effective management of copyright in the blockchain system.

4.2.2 Private Property Rights

The right to private property differs somewhat from the copyright: the copyright is considered an original right, while the other is a derived right, that comes from the original as a development of the first one. In this type of property, the right of possession, control, exclusion, to derive income, and the right of disposition over an available asset are ensured.⁹⁵ In this way, the works can be transferred to the open market, giving these owners the possibility to finalize sales contracts.

Considering that the NFT allows fractional trading of assets of a certain work of art, there will be a form of common ownership in the same thing, so that each joint owner owns a percentage of the entire property, even if the part belongs to each one, cannot be physically identified on the property.⁹⁶

In this sense, each unit owner could use the property in its entirety at any time, with the prohibition of changing its destination without the consent of the other co-owners, as well as preventing its use by unauthorised third parties.⁹⁷ It will also be necessary to observe whether a given work of art is protected by copyright, a situation in which the community property right should only be exercised over the physical and not the intellectual property.

In the NFT system, as the name suggests – a non-fungible system, the domains of property law represent a major legal problem. It is known that for a property right to be made available or even transferred, within its characteristics in a non-changeable situation becomes insubstantial. This means that the property right must be interpreted under new guises, before it's incorporated into an NFT, as property would become immutable. It would be necessary to find a solution to harmonize the dynamics involving property rights with the attribute of immutability of the technological system.⁹⁸

In the case of co-ownership, the problem is even worse, since each token would represent a part of the property, and the exercise of this right, by one of these parties, would require everyone's permission. There must be an agreement of will between all

⁹⁵ Junior José L. de M. F. and Roth Gabriela, 'Como a utilização do blockchain pode afetar institutos jurídicos tradicionais' (2019) 14 RJMPC 39.

⁹⁶ Simone Morabito, 'Profili giuridici degli NFT (Non fungible tokens) tra arte e blockchain in Italia' (*Business Jus website*, 2021) <<https://www.businessjus.com/wp-content/uploads/2021/01/Profili-giuridici-degli-NFT.-Tra-Arte-e-blockchain.pdf>> accessed 19 August 2021.

⁹⁷ Ibid.

⁹⁸ Ana F. C. Ferreira, 'O uso da rede blockchain no mercado criativo: a gestão de direitos autorais de obras musicais no ambiente digital' (Dissertation, Universidade Católica de Pernambuco 2020).

of them, a harmonisation in the exercise of related rights, otherwise the co-ownership would lose its essence.

There are other aggravating factors when it comes to joint ownership in the NFT, which are the anonymity and distribution of rights. The Blockchain-NFT system strives for privacy and anonymity. However, anonymity is a difficult factor to solve if there is a conflict of interest in the exercise of joint ownership. And, if this conflict arises damage to either party, it would be difficult to identify the author in order to assign his responsibility. Although the differentiation in the distribution of faculties that are attributed to each co-owner may represent an additional problem, as ownership may be under the custody of one of the owners, but the right of enjoyment with another. These situations need further reflection from the part of legal operators, carefully examining the relevance and consequences of the use of technologies that impact legal institutes.

4.2.3 Registration of the work in the NFT

The registration of a work of art is optional and not mandatory, but its formalisation constitutes greater security and the formation of documentary evidence generated by the registration is attributed to legal force and relevance. It is by registering the work that its conservation and the individualisation of subjective rights is guaranteed.

The registry is predominantly public, since the registered bodies exercise functions under public law, in that it confers authenticity, security and effectiveness of legal acts in a preventive way, not only in terms of declaration, otherwise also in the constituent effect. Through the registration it is allowed the recognition of authorship, specifying the rights and establishments in terms of protection, constituting itself in a form proper to the preservation of culture.

Since it is embodied with public faith, the registration within the public registries generates presumption of authorship, so that the person who registers will be appointed as the author of the work.

When it comes to works of art, temporality is also precise and clear with the register. Thus, in the event of possible misuse by third parties, there is a presumption of the creation date attested by an official institution, and it is also easy to include certain works in the public domain collection.

From the standpoint of authenticity and security, blockchain technology and NFT certainly guarantee the unalterable treatment of the registration of a work, but this

characteristic refers to electronic security.⁹⁹ However, electronic security differs from legal security, as it is not enough for registration to preserve the work in an immutable and indestructible way; it is necessary that for those instruments to be endowed with important legal effects by previously qualifying the titles emanating from the registry.¹⁰⁰ It is observed, therefore, that the electronic registration does not generate the same effect as the official registration, since its embodied with public faith and the digital is constituted a private nature.

The fact that the registration of a work is done internally, in official bodies, makes it difficult not only to identify the authorship, but also in the legal limits of use when the work is for the trading market. This problem can be overcome if registered on the Blockchain, as it facilitates obtaining information about the work, its ownership, its legal role, if it is under copyright protection, or if it is in the public domain. In a nutshell, it allows a more effective management.

Although blockchain registration does not replace the one made in official registration institutions, it must be recognised that this technology guarantees not only the age of registration, but also the integrity of the content, authenticity and immutability of the document. Some countries have projects to implement blockchain technology in registry services,¹⁰¹ not as a substitute, as the institutions have authority and public functions, which the technological system is not capable of obtaining,¹⁰² but as a tool to help categorize the registered forms of art.

5 Conclusions

The current scenario of legal doctrine and examples are insufficient in terms of the understanding and scope of traditional institutes with the increasingly complex formatting of facts under revolutionary technologies that reach beyond borders.

The international expansion of the arts trade is a clear example of technological power and its high capacity to transform the market.

The new reality of facts arising from the application of blockchain, NFT and smart contract technology, from a technical point of view, promises agility, security, integrity and authenticity in the international trade of works of art. Effectively, technological resources have demonstrated that these instruments and procedures related to the international art trade are currently widely used, reflecting on the annual sales volume,

⁹⁹ Vecchi Leonardo Garcia, 'O uso da tecnologia blockchain no serviço notarial e registral e seus reflexos nos custos da propriedade privada: um estudo da sua viabilidade técnica, jurídica e econômica' (Dissertation, University Federal de Goiás. Goiânia 2021).

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

¹⁰² Ibid. Projects under development in Germany and Catalonia are mentioned, where the technological instrument is used to combat counterfeiting and not replace the public record; likewise in Japan, the aim is only to maintain greater control by simplifying and unifying the registry service.

reaching impressive levels. Alongside the euphoria of the art market with digital technology, it is also necessary to refer to the impacts of market transformations caused by the use of such technologies in the social environment.

The analysis of the main changes that occurred in this scenario raises interesting legal questions. Several institutes are impacted that have the need to reformulate the role of law, by having new ideas, expanding the interpretive effort causing the revisiting of the traditional legal institutes to be redefined in light of the potential of these technologies.

Traditionally, contracts are in oral or written form, the establishment of the legal relationship occurs after its signature and execution is driven by one of the parties; in smart contracts, on the other hand, the format is codified, there is anticipation of the legal relationship and they are self-executable; aspects of immutability and anonymity that do not exist in the traditional contract are also observed. These situations require an urgent review of the legal concepts inherent in the theory of contracts, as more and more participants are seeking the use of blockchain and smart contracts, as they are of essential importance, not only in the international art trade, but also in meeting different needs commercial and in different sectors.

Likewise, in the field of property rights, whether intellectual, more precisely author rights, or ownership rights and private property, it has been revolutionised through the use of technology translating itself in the form of the NFTs. In copyright, technologies promise authenticity and traceability of works, in order to avoid any violation of their rights. However, for the author's right to have effective protection, it is necessary to register it in an official body, which will give it public faith and legal certainty. Although the registration can be done in the blockchain itself, it will not have the effect of legal security nor will it embody public faith, which are exclusive attributes of the public function. These are innovative dimensions and challenges for public authority in re-dimensioning the nature of this function.

It is concluded, therefore, that as technology advances and the use of NTFs are becoming each day more and more in use for the art market, the approach of the traditional legal institutes and doctrine, seem to be no longer adequate, and a review of the concepts and nature of legal institutes should be adopted, reformulating the paradigms for the new legal, social and technological reality.