The Future of Tokenizing:
Art Industry in Decentralized Space.

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Abstract

The time being spent online is becoming more important, encouraging companies and industries to follow consumers into the digital space. Along with that, technologies, systems of values, and business models are adopting. The dissertation aims to study the vectors of the Rare Digital Art market development and answer questions about what processes and players will shape this emerging branch of the art industry. This work presents an alternative Value Chain model tailored to Crypto art projects, and concludes that the project cycle will become faster and more activities will fully or partially migrate online.

Our research suggests that the rare crypto art market will inherit the technological capabilities of a DeFi market, while maintaining creativity and aesthetics of the art industry. We conclude that validation activities and players will gain an even stronger position in this emerging market, while managerial positions will weaken. Digital Art will move the art industry towards innovative blockchain applications and sophisticated DRM use cases.

Key words: Crypto Art, NFT, Art Market, Art Token, Blockchain, Contemporary Art, Fine Art.

Sumário

O tempo passado online está se tornando cada vez mais importante, incentivando empresas e indústrias a seguirem os consumidores no espaço digital, junto com isso estão surgindo tecnologias, sistemas de valores e modelos de negócio.

A dissertação tem como objetivo estudar os vetores de desenvolvimento do mercado de Arte Digital Rara, e responder a perguntas sobre quais processos e personagens moldarão este ramo emergente da indústria da arte. Este trabalho apresenta um modelo alternativo de Cadeia de Valor adaptado aos projetos de arte Crypto, e conclui que o ciclo do projeto se tornará mais rápido à medida que mais atividades migrarão total ou parcialmente para online.

Nossa pesquisa sugere que o raro mercado de arte criptográfica herdará as capacidades tecnológicas de um Mercado financeiro descentralizado, mantendo a criatividade e a estética da indústria da arte. Concluímos que as atividades de validação e os personagens ganharão uma posição ainda mais forte nesse mercado emergente, enquanto as áreas gerenciais enfraquecer-se-ão. A Arte Digital levará a indústria de arte para aplicativos inovadores de Blockchain e casos de uso sofisticados de DRM.

Palavras-chave: Crypto Art, NFT, Art Market, Art Token, Blockchain, Arte Contemporânea, Belas Artes.

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DAO = Decentralized Autonomous Organization
DApp = Decentralized Application
DeFi = Decentralized finance
DEX = Decentralized Exchnge
DLT = Distributed Ledger Technology
DRM = Digital Rights Management
EIP = Ethereum Improvement Proposal
ERC = Ethereum Request for Comment
ETH = Ether
IPR = Intellectual Property Rights
NFT = non-fungible token
PoS = Proof of Stake
PoW = Proof of Work

1   Literature Review

1.1   Introduction

The concept of art in modern (Western post-18th century) society has inherited an ideological function (Clowney, 2011; Bourdieu, 1993). Art pieces themselves, as well as respective institutions, concepts and practices, summarized by Pierre Bourdieu as the 'field of art', are meant to entail notions of a relative independence of aesthetics from other sorts of value (Bourdieu, 1993). However, the shocks of modernization and globalization brought about by the fast-changing needs of continuously developing society have continued to expand the idea of attributing artistic value to a wider scope of material objects. Consequently, new perceptions of art tend to challenge definitions applied by modern philosophers, urging us to revisit assumptions of what may be classified as art (Clowney, 2011).

March 2021 marks an event which meant to shift the paradigm and disrupt the industry of fine art. The third most expensive "art" piece by a living artist was sold for $69 million (Kinsella, 2021) at Christies - the biggest auction house for fine arts and collectibles (Ashenfelter, Graddy, 2005). The auctioned lot was a fully digital collage of 5000 images titled "Everydays: the First 5000 Days" by the internet artist Mike Winkelmann, known online as Beeple (Taylor, Sloane, 2021). This event made the news – the buyer paid an astronomical price for a JPG image, which is available online to any internet user (Reyburn, 2021). However, even this is not entirely true. The sold item was, in fact, a digital unit of data (a token) (Chevet, 2018), associated with that image, meaning that the cryptographically represented right of ownership of the digital piece (Dowling, 2022) was sold for the record sum, and was proclaimed to be an art deal (christies.com). Thus, it became evident that the art world was in the midst of a novel and significant experience.

This flashy sale has mapped a recently-emerged concept of digital art's protocol known as NFTs (Non-fungible tokens) onto the timeline of art history. Skepticism about whether digital pieces have any future as a part of the market is ongoing (Smee, 2021); however, the broad range of NFTs application opportunities and skyrocketing number of sales are hard to ignore (Shah, Moss, 2021): in the first half of 2021 NFT sales totalled $1.3 billion, with 25% of

those sales by value ($324 million) attributable to art (McAndrew, 2021; Nonfungible.com, 2021).

1.1.1 Problem Statement

Digital art as such is not a new phenomenon, however, there was previously little interest in it because of its replicable essence (Taylor, Sloane, 2021). NFT technology has stepped in and enabled works of art, collectibles and other assets that gain their value from scarcity to extend their presence to the digital space (Fairfield, 2021) by allowing the pieces to certify for the exchangeable value (Scalet, N/A).

Crypto art has become part of a present-day culture and language, creating a new market with next generations of collectors, coders, artists, speculators, influencers and other groups (Franceschet, 2020), allowing for emergence of new art genres and creating the potential to further develop and transform the existing ones (Colavizza, 2019).

We aim to explore the opportunities that NFT technology is facilitating in the context of the art industry. This work will focus on studying the most noticeable novelties that differentiate the NFT art market from traditional art commerce. This paper is designed to provide answers for questions concerning *which processes and which players will shape the emerging rare digital art segment? We will draw parallels with the traditional art market to examine overlaps and discern what is going to be left behind.*

1.2 NFTs: Crypto Art on Blockchain

To further analyze the digital art market, we will first elaborate on the Web 3.0 technological and ideological pillars on which crypto art is built. NFTs are one-of-a kind cryptographic tokens, or units of data, each attributable to a rare piece of digital art and registered on a Blockchain (Colavizza, 2019). Please note, that there are alternative objects other than art that tokens can represent and alternative kinds of public ledgers other than Blockchain that they can be registered on (Chevet, 2018), but in the context of this work we will focus on NFTs as crypto art tokens that are registered on Blockchain.

1.2.1 Blockchain

Blockchain is a type of distributed public ledger technology (DLT), which serves as a database, where no single entity has control and anyone can write code. Most Blockchains store information about who owns what (Fairfield, 2021), ensuring secure trading and possession of digital assets (Colavizza, 2019). Blockchains use cryptography to ensure consensus over the economically valuable tokens across the user network (Yaga, 2018) without any trusted third party (TTP), meaning Peer-to-Peer agreements generate trust.

First introduced in 2008 by the to-this-day (October, 2021) unknown author(s) appearing under the name of Satoshi Nakamoto (Nakamoto, 2008), Blockchain technology became a cryptographic breakthrough designed to challenge many of the fundamental concepts of conventional finance (Chen, Bellavitis, 2020). Founder(s) of the first Blockchain titled Bitcoin pioneered in solving two important problems (Mingxiao, 2017) of the internet space: first, the computational issue known as the Byzantine Generals' Problem, which challenges the information asymmetry across the parties and ability of those parties to identify one another and come to consensus without relying on a central intermediary, i.e., being trustless (Lamport, 1982). Secondly, as a monetary system, Bitcoin cryptocurrency became a solution to the "double-spending problem" (Chohan, 2021): if anything on the internet is replicable and digital money is simply a unit of information, how can it be prevented from being duplicated and spent multiple times (Wallace, 2011; Kaplanov, 2012)?

The innovative solution deployed by Blockchain is the consensus mechanism (Nakamoto, 2008). This is the key protocol which enables the validation process to happen without central authority (Buterin, 2014). Today (October 2021), there are already several of those consensus mechanisms, but the Blockchains that are most relevant to this work use Proof-of-Work (PoW) and Proof-of-Stake (PoS).

The Blockchain network consists of miners (in PoW) or validators (in PoS), who are responsible for creating and transmitting new blocks; and nodes, who receive these blocks, add them to the Blockchain and store them (Groffith, 2019). In order to convince the nodes that the transmitted block is legitimate, a fair competition takes place whereby miners compete with each other to solve a cryptographic problem based on the data inside the block, to create a fitting hash function (BitFury Group, 2015). Coming up with solution before

others results in being selected to validate a block that is further added to the Blockchain for a reward in form of cryptocurrency. With PoS, validators are selected randomly from those who fulfill the criteria related to their stake in the Blockchain-native currency (Buterin, 2014). Validators are responsible for creating blocks, as well as checking and confirming blocks created by other validators. After being added, blocks within the Blockchain are intertwined into what is called a Merkle root – an append-only summary statistic (Bansal, 2017). In the case of any details of the block or their order being altered, the Merkel root changes (Bansal, 2017). Thus, falsifying the ledger in PoW system requires too much work, as at least 51% of the network will have to consent to the new Merkle root, and in PoS systems there is too much risk of being penalized (Fairfield, 2021), making Blockchain a commonly acknowledged secure P2P system.

As much as it is the technological breakthrough, it is also a socioeconomic novelty (Bansal, 2017). The concept of Blockchain has decades of underlying history, where the ideological propositions underlying it were being shared and lobbied for by the community of Cypherpunks (Qureshi, 2019) – a group of likeminded individuals advocating the use of cryptography as a paramount tool to ensure privacy (Hughes, 1993). *"[The code] will present the greatest threat to both liberal and libertarian ideals, as well as their greatest promise. We can build, or architect, or code cyberspace to protect values that we believe are fundamental. Or we can build, or architect, or code cyberspace to allow those values to disappear. There is no middle ground."* - Lawrence Lessig, 2006.

One of the core convictions of the movement is that the internet will become a space where the battle over freedoms will unite people, erasing borders and diminishing power of institutions and corporations (Qureshi, 2019). In line with this logic, success of the Blockchain extended its capabilities into multiple areas and industries, combining and reshaping them in the internet space (Bansal, 2017).

The Venn diagram below, prepared by the founder and CSO of Unchained Capital in 2017, exhibits the interdisciplinarity of Blockchain and other technologies and concepts (Bansal, 2017).
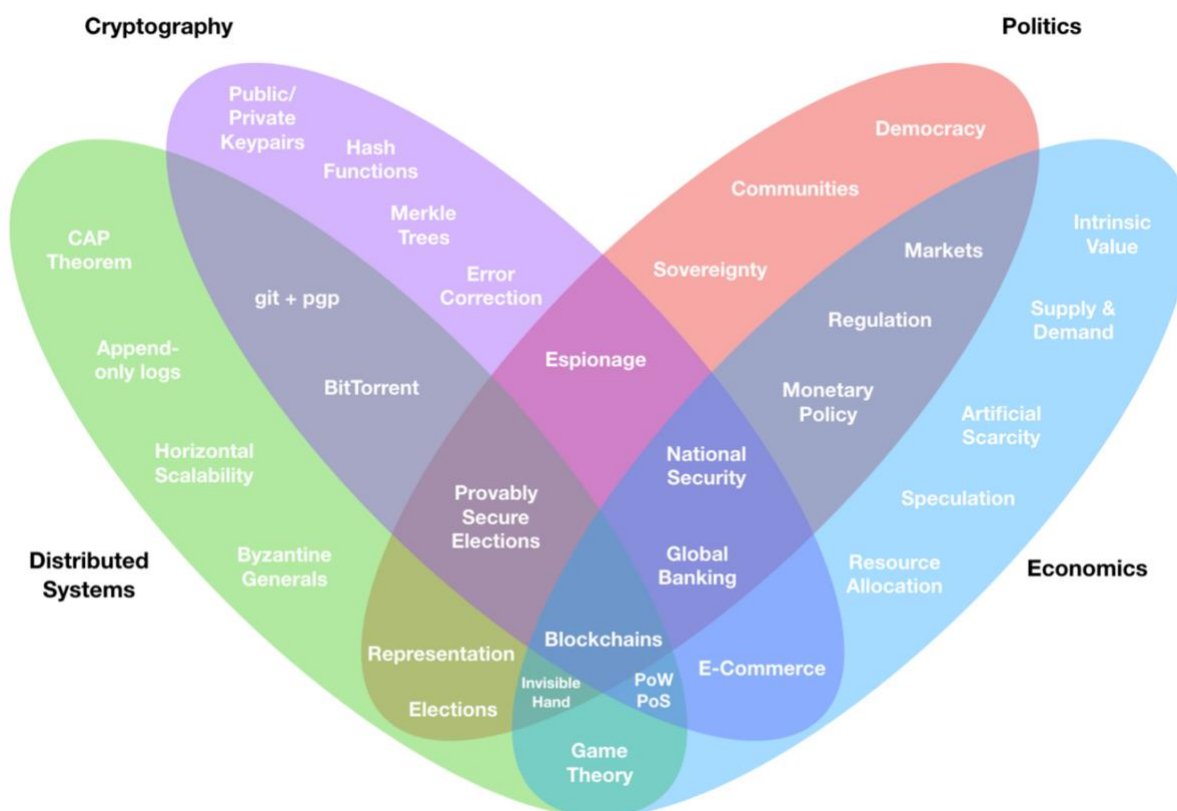
Figure 1 The Blockchain Spectrum (Bansal, 2017)

Technical components of Blockchain include Cryptography (purple) and Distributed Systems (green) and are presented on the left side; social disciplines are Politics (pink) and Economics (blue) on the right side (Bansal, 2017).

Cryptography

In the context of Blockchain, cryptography is responsible for technical definitions and enforcement of the protocols, equalizing of all participants vis-à-vis the system (Bansal, 2017). This contrasts with previous notions of computer code where *"code is law"*, with considerable ability to constrain user action as the rules are mediated by the code's initial design (Lessig, 1999). Blockchain has enabled coding to become more inclusive by introducing the ability to upload individual snippets of code to the underlying technology (Blockchain) (Filippi, Hassan, 2018). This reshapes the *"code is law"* notion to *"law is code"* (Filippi, Hassan, 2018), by making coding more decentralized and accessible.

Distributed Systems

Cryptography provides the tools of governance without central authority, the so-called "rules without rulers", making Blockchain one of the best examples of a distributed system within

the internet space (Bansal, 2017). The main advantage that such systems have over the centralized ones is the high level of redundancy, allowing for greater independence and scalability (Bansal, 2017). As noted earlier in this chapter, Blockchains exist via collective maintenance by the community members, allowing the network to become administrators by becoming miners and validators (Fairfield, 2021).

Economics

The economic component of Blockchain produces a virtuous operational cycle. By creating economic incentives, Blockchain systems set the behavioral patterns of the network: mining to acquire tokens and create consensus, acquire tokens to earn, ensure safety of private keys, etc. (Bansal, 2017). Presence ща a healthy cycle is permitting assets of the Blockchain to gain value (Yaga, 2018).

Politics

"The Times 03/Jan/2009 Chancellor on brink of second bailout for banks" – this line is embedded in the code of the Genesis block, which is pointing at Blockchain having a political stance at its core. Determination of the Blockchains consensus rules is the most political process (Bansal, 2017), as it defines who will get power and how much. The politics of Blockchain differs from traditional forms of governance due to its high level of transparency and the ability of the Blockchain system, if needed, to execute complete network polling instead of sampling (Bansal, 2017). This wires up the network community and makes potential acts of corruption or coalition less likely than in traditional governance systems.

While there are many Blockchains in existence, each one with its own networks of nodes and sets of features and capabilities, most NFTs to date (October 2021) belong to the Ethereum Blockchain (Nadini, 2021). Ethereum stepped in as an extension of Blockchain's capabilities after Bitcoin started gaining traction – on top of initial payment system, Ethereum enabled developers to build various Decentralized Applications (Buterin, 2014). Because of its programmable nature and broad variety of features, Ethereum gained popularity and became the home network to many of the most popular DApps.

1.2.2 Non-Fungible Tokens

NFTs are a concept allowing for inclusion of unique assets in the Decentralized Exchange. As mentioned earlier, such tokens are the digital units of data that are used to represent ownership of objects in the digital space (Dowling, 2022). Acquiring an NFT, however, does not grant an owner any exclusive rights over the item itself. Tokenized objects, be they video, images or collectables are publicly available online and, unlike the token itself, very fungible, meaning that anyone with the internet is able to search, copy and download it.

1.2.3 Ethereum Standards

The major tool of Ethereum applications is Smart Contracts. Those are cryptographically ensured contractual agreements execution instruments (Szabo, 1996), which provide the means for running programs on Blockchain, such as development of DApps. Ethereum uses smart contracts for its token standards, which appear in the form of ERC (Ethereum Request for Comment) (Buterin, 2014). Standards define the function set for particular token type (Febrero, 2019). For example, the ERC20 is the most widespread standard for fungible tokens, which is used for cryptocurrencies and voting tokens. In the context of NFTs, smart contracts are used for the process of minting, ownership granting, and transferability management (Buterin, 2014). To date (October 2021), most NFTs use standards ERC721 (non-fungible) and ERC1155 (non-fungible and semi-fungible). These two ERCs are the protocols for NFTs that have been agreed upon within the Ethereum community. ERC721 was the original standard designed for non-fungible tokens (Ray, 2021).

```
1    contract ERC721 {
2        // ERC20 compatible functions
3        function name() constant returns (string name);
4        function symbol() constant returns (string symbol);
5        function totalSupply() constant returns (uint256 totalSupply);
6        function balanceOf(address _owner) constant returns (uint balance);
7        // Functions that define ownership
8        function ownerOf(uint256 _tokenId) constant returns (address owner);
9        function approve(address _to, uint256 _tokenId);
10       function takeOwnership(uint256 _tokenId);
11       function transfer(address _to, uint256 _tokenId);
12       function tokenOfOwnerByIndex(address _owner, uint256 _index) constant returns (uint tokenId);
13       // Token metadata
14       function tokenMetadata(uint256 _tokenId) constant returns (string infoUrl);
15       // Events
16       event Transfer(address indexed _from, address indexed _to, uint256 _tokenId);
17       event Approval(address indexed _owner, address indexed _approved, uint256 _tokenId);
18   }
```

Figure 2 erc721-definitions.sol (Nash, 2017)

Figure 1 contains visualization of the basic properties of an ERC721 Smart Contract (Nash, 2017). Decoding it line by line allow us to understand its functional reach and technical specialties:

The first section (lines 3-6) ensures the Contract's token compatibility with the ERC20 standard.

• *Line 3*: is responsible for letting other DApps and contracts know the "Name" of the NFT;

• *Line 4*: is responsible for providing the same externals with the short version "N" used to refer to this NFT;

• *Line 5*: indicates the total supply of the coins on the Blockchain, a number that does not have to be constant;

• *Line 6*: is responsible for checking for the number of tokens that the given wallet address owns;

Ownership functions (lines 8-12) are responsible for defining the ownership and transferability settings.

• *Line 8*: is responsible for checking an address of the owner via unique ID of the NFT;

• *Line 9:* grants the owner permission to transfer ownership to another entity;

• *Line 10*: prevents this entity from withdrawing tokens from another user's account;

• *Line 11*: is responsible for allowing the owner of the NFT to transfer it to another user that has been pre-approved by the owner;

• *Line 12* (optional): is responsible for keeping a record of the IDs assigned to the NFTs owned by each user in order to be able to retrieve NFT by the index associated with it within the array;

NFT-defining data is stored outside the chain and is connected to the token itself using the references in the forms of IPFS hash or HTTP(S) link. Such references are called Metadata and off-chain programs use them to execute the logic of finding additional information about an NFT.

• *Line 14* (optional): is responsible for defining tokens' Metadata;

Events (lines 16-17) are triggered as contract calls and are further transmitted to any listening outside programs. These programs further execute the logic in accordance with the event details.

• *Line 16:* A transfer event is broadcast when NFT changes owner;

• *Line 17*: An approval event is broadcast when one user approves another one to take ownership of an NFT; (Nash, 2017).

Please note that this code is an elementary example simplified for explanatory visualizing purposes and is not designed for implementation.

Another important standard of NFT, that has not been mentioned in Figure 2, due to it recently coming about, is EIP2981. This Ethereum standard is responsible for attributing secondary sales royalties to the creators or right holders (Burks, 2020).

1.3   Art Market Value Chain

Michael Porter has outlined the Value Chain model (Porter, 1985), which is helpful for the competitive analysis across many industries, mostly ones that produce tangible products and require some input. However, this model is not applicable for Creative industries (Chen, 2016).

Cultural and Creative Industries are characterized by high reliance on support functions and ancillary tools throughout the value creation process (Chevet, 2018). As performance metrics are subjective and hardly measurable, success is commonly defined by the network (Barabasi, 2018). The network associated with traditional art market includes galleries, auction houses, curators, dealers, advisors, collectors (Joy, Sherry, 2003) and others, most of which are intermediaries, living off fractions of cash flows involved in trading processes (European Commission, 2017). These commission costs, as well as the validation and execution necessities, are lowering the liquidity of the art market, complicating the value creation, and making art objects difficult and expensive to trade (Chevet, 2018).

Existing literature point to market characteristics that influence the value creation processes and justify the presence of intermediary tools and parties. Firstly, there is a high level of information asymmetry between creators and buyers of artworks (Prendergast, 2014), because artworks are characterised as information goods (Zorloni, 2013), meaning that the art object has some historical, symbolic and sentimental attributes that attach to it. This intrinsic value captured in the piece evolves and changes over time in accordance with the events, social environment, and time passage (McCarthy, 2001). The psychology of buyers also makes art an experiential good after the acquisition of a piece (Arora, Vermeylen, 2013), and often an external advisory and support occurs in the selection process.

Secondly, Cultural and Creative Industries are adopting many of the features of the service economy (Potts, Cunningham, Hartley, and Ormerod, 2008), relying on human assets in terms of value creation (Cartwright, Oliver, 2000). Artistic goods, therefore, acquire their value as a result of a complicated set of relationships between materials, production, symbolic meaning and consumption, which a traditional value chain is not readily able to capture (Pratt, 2008).

Visual art pieces are commonly associated with long physical durability and a well-established secondary market (Prendergast, 2014). These characteristics, topped with the instrumental benefits (McCarthy, Ondaatje, Zakaras, Brooks, 2001), make art an attractive asset class for investment. Therefore, similar to the stock market, art is surrounded by large networks of information and number of information transmitters (Resch, 2011), which further adds to the complexity of the value chain in the art industry.
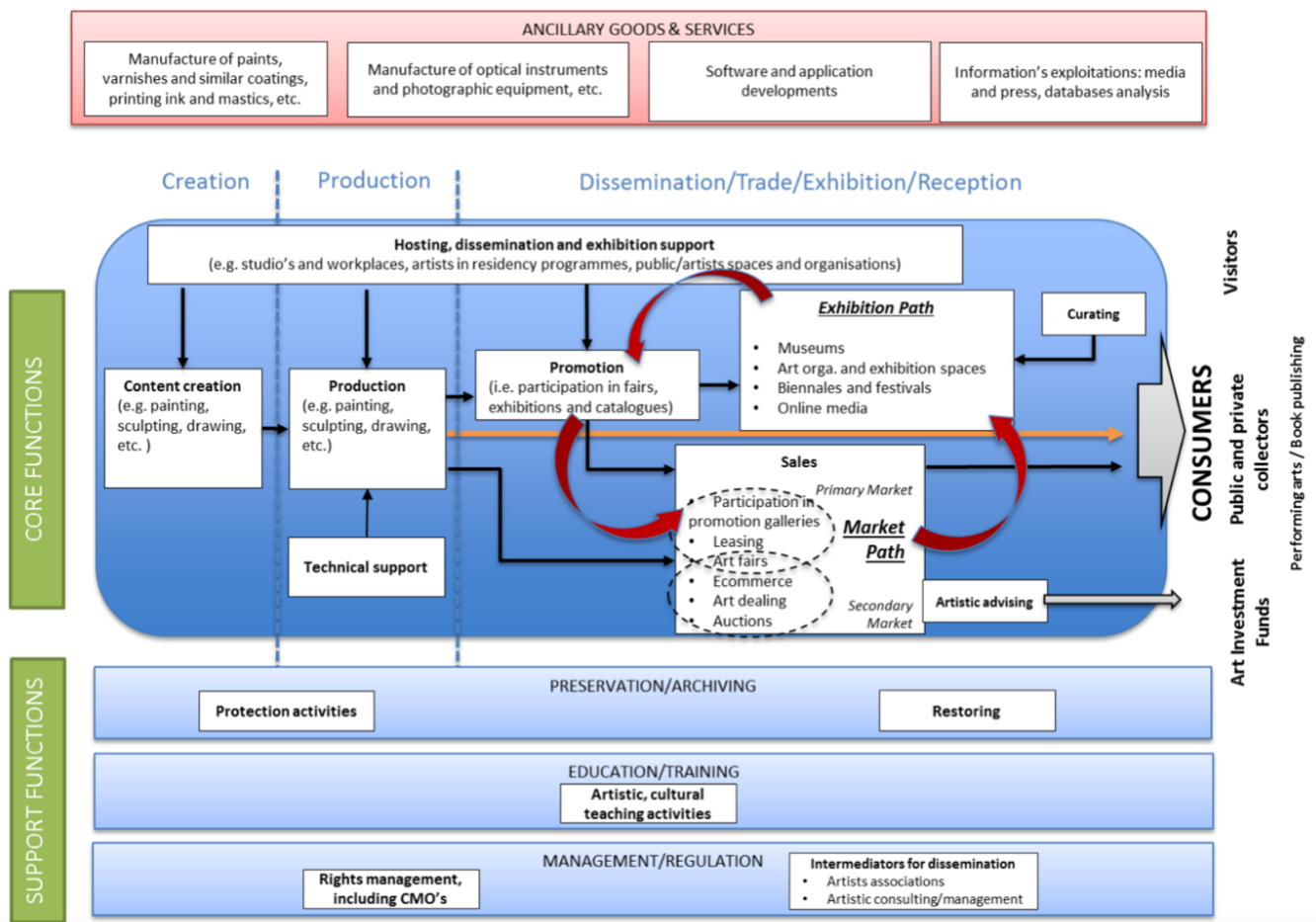

Figure 3 Stylized Value Chain for Visual Arts (European Commission, 2017)

The "Value Chain for Visual Arts" model, designed by the European Commission research team in 2017 (Figure 2), breaks down relevant activities into core and support functions. The core is further divided into three phases: creation, production and dissemination/trade (Market path) & exhibition/reception (Exhibition path) (the last processes are non-linear and may occur before one another) (European Commission, 2017).

The main goal of the exhibition path is to expose the art work to a wider public, rather than executing a private sale, while the market path implies aiming for sales in the primary and secondary markets. Various functions within this stage are interrelated and may have different iterations. Although particular works of art might follow slightly different pathways, the European Commission research has outlined a generic roadmap which includes the following steps:

1. Artwork creation & production by the artist;
2. Initial, often free, exposure via platforms, public spaces etc.;
3. Finding a gallery/curator;
4. In the case of success, a gallery further undertakes a set of activities to promote the work. For example, it takes the work to art fairs, prints catalogues, engages in exhibiting, to then finally execute a primary sale;
5. Limited number of works will then re-enter secondary market;
6. Some artworks might take the "high-end exhibition path" and be shown in the galleries or museums, gaining provenance as a consequence; (European Commission, 2017).

We will further delineate all the players in the art market and their roles, following the structure of the Model (Figure 3):

Visual Artists

Visual artists are defined as persons who identify themselves as such and also are identified this way by their peers (Schrauwen, Demol, Van Andel, Schramme, 2015). Visual artists create and produce, while being less active in the dissemination/trade stage (European Commission, 2017).

Studios, Creative Hubs, Associations, Collectives

These environments enable exposure, visibility and expertise, mostly in the creation and production phases, however, they can also offer exhibition spaces and play a role in the dissemination/trade and exhibition/reception phases (European Commission, 2017).

Dissemination / trade (Market path)	*Exhibition / reception (Exhibition path)*
Sales galleries	**Art Rentals**
Sales galleries play a similar role to art dealers, but provide a concrete location for trading. Galleries may act as a buyer on the primary market while being a marketplace for secondary market deals. They search for consistency in selecting artworks, rather than choosing artists (European Commission, 2017). Sales information is not publicly available.	Art rentals can also be active in the market. Their business is about leasing artworks for a period of time with an opportunity of subsequent sale during or at the end of the rental period. This practice originated with a purpose of promoting emerging and local artists. Art rentals do not demand exclusivity and act as incubators (European Commission, 2017).
Promotional galleries	**Museums**
Promotional galleries take on representation and management roles to promote selected artists with an aim of creating visibility and increasing their market value. These galleries are active in the primary market and usually offer similar conditions for all represented artists:	Museums tend to rely on the secondary market players as well as collectors and artists themselves when acquiring artworks. They also engage in a broad spectrum of activities, like shops, collaborations, restaurant businesses, etc., to increase profits and meet their running costs. In the contemporary art scene, museums have a large influence on the value and prestige of pieces. They enhance the status of artists and private collections by serving as a highest validator on the market (European Commission, 2017).
• exclusivity (at least in one country);	
• durability (1-2 years);	
• sales share (between 40% and 60%);	
While providing services of:	
• management;	
• promotion and exposure;	
• financial support;	
• exhibiting space.	**Artistic organizations, exhibition spaces**
Promotional galleries are often defined by their networking activities having close relations to artists they engage with and also with many other actors of the art world such as collectors, dealers, auction houses and	Unlike museums, such organizations are not pursuing a goal of heritage preservation and hence do not have permanent collections. Apart from providing exhibition spaces, they

museums (European Commission, 2017). Galleries with a rather strong reputation can undertake a certification role for works (Prendergast, 2014).

Art Dealers

Similar to Sales Galleries, Art Dealers are focused on buying and selling art works mostly in the secondary market (European Commission, 2017).

Art Fairs

Art fairs group various dealers and promotion galleries according to their size, price and the stage of artist development (European Commission, 2017). Works are often vetted for quality and authenticity by a committee before being allowed to be shown. The average cost of attending an Art Fair exceeds EUR 25 000, making it one of the most expensive ways of promoting art (Zorloni, 2013).

Auction Houses

Auction houses are mostly active in the secondary market with the bidding system acting as a validation and acknowledgement of an artwork (European Commission, 2017). Auction houses on average claim between 12% and 25% commission from the buyer's side and an additional 10% from the seller's side in some cases (Zorloni, 2013). Auction houses usually provide minimum price guarantees to sellers that vary according to specific conditions (European Commission, 2017).

undertake an incubation mission by providing studio spaces and networking. These types of organizations are often state funded and can be non-profit. As visible in the Figure 3, they play key role in the production and promotion phases of the value creation process (European Commission, 2017).

Biennale and festivals

These are temporary events varying in scale, location and orientation. They mostly rely on curators and due to their short duration are more in touch with the market trends (European Commission, 2017).

Online media

Online media in this context are different from e-commerce and refers to the accessibility of art in the online space, in which we are particularly interested in the context of this work. Internet sources that host digital copies of art help enhance their visibility and promotion. However, some research points to downsides of growing online availability of physical visual artworks:

• artworks being actively exploited online without a fair remuneration of the author(s);

• integration of art containing images in web-pages often can be misleading, preventing creators(s) from being recognised as such, receiving revenues, or

E-commerce

The Internet is gaining more traction, with online sales mostly attributable to the Auction Houses and less to the Dealers and Galleries (European Commission, 2017).

being in control of image appearance, thanks to the hosting provider platforms framing these images;
(European Commission, 2017).

Consumers

Private Collectors

Collectors can undertake multiple roles, acting as dealers, and managing and exhibiting their collections. There are several ways of collection ownership including individual, family funds, corporate and alternative legal structures (for example foundations). Established collectors possess a great deal of market power and they influence the evolution of demand.

Investment Funds

Funds seek to buy art as an investment opportunity, diversifying their portfolios and pursuing higher non-correlated returns (European Commission, 2017).

Visitors

The main role of visitors at art-related events is to show social support. Their online interaction with art in a form of reviews, posts and discussions further adds to the importance of their role. (European Commission, 2017).

Additionally, there are some intermediate players supporting connections between the actors and core functions of the value chain (European Commission, 2017).

Art consultants & managers

As most artists lack business knowledge, these individuals act as professional representatives and help artists to manage their personal brand. Such activities include consultancy services, grant applications, bookkeeping, legal and tax advice. Promotional galleries can sometimes also offer similar services to artists (European Commission, 2017).

Curators

Curators are the individuals most active in managing interactions and transacting between artists and exhibition opportunities. They are responsible for negotiation, selection and supervision (European Commission, 2017).

Advisors

These are private individuals with some relevant art market experience who are hired by collectors for advisory purposes (European Commission, 2017).

Online databases

Platforms like Artsy and Artprice are gaining significance in the market, as they continuously broaden their scope of activities and offer free access to structured information. As databases, they provide in-depth analysis of the market relating to price, demand, and RoI, etc. (Arora, Vermeylen, 2013).

Art libraries

These are more old-school information sources mostly used by the artists. When it comes to art libraries, artists tend to approach this interaction in an exploratory and intuitive manner. The most popular source of browsing are catalogues and the most used services are librarian assistance and photocopying (Stam, 2016).

Collective Management Organizations

Like managers, CMOs are bridging different players in the value chain. They are particularly active in the secondary market, informing artists about valuations, helping them to collect royalties, manage copyrights, etc. (European Commission, 2017).

When looking at the new paradigm of the market, digitisation is altering the value chains across creative industries (Chevet, 2018) in several ways. First of all, there is the technical component which has enlarged the scope of tools authors can use for creation and production. Wider opportunities in terms of reaching people are enhancing the artists' participation in the dissemination/trade phase as well as in the exhibition/reception phases. It is expected that wider information availability will reduce arbitrage opportunities for intermediaries (European Commission, 2017).

The main response of promotional galleries so far has been development of their digital duplicates and creation of customer friendly custom tools for richer online experiences (European Commission, 2017).

Auction houses that operate in emerging market sectors have been more active online, applying various technologies in marketing their art pieces (Arora, Vermeylen, 2013), and it is generally expected that the trend of online sales will continue to rise. Auction houses have made the information on sales history publicly available, empowering consumers to get informed without the help of an "insider" intermediary (European Commission, 2017).

Interestingly, museums, who are considered the highest validators of visual arts, are the most active in adopting various digital models. They are actively creating high-level experiences online, exploring of their collections, as well as engaging and interacting with online communities (European Commission, 2017).

Online availability of market-related information, such as sales prices, bid offers, etc. is bringing more transparency to the market, contributing to relatively lower transaction costs (Arora, Vermeylen, 2013).

2 Methodology

2.1 Research Design

For the primary research we selected a qualitative approach which is best suited for this kind of study (Birkinshaw, 2011). Additionally, as has been already discussed, the art industry, as well as the crypto community are associated with high levels of insider information and information asymmetries. There are also large varieties of multi-disciplinary professionals of different backgrounds having different views and approaches to the topic, especially when it comes to a developing field.

Given this, the selected research design is the Grounded Theory Method and we will use coding to process the data. The chosen method allows for great level of ingenuity in development of a theory from primary data (Strauss, 1994). To analyze and compare the Crypto Art Market, we identified patterns within the traditional contemporary art market and discerned unique new features. We did this through expert interviews with professionals from two segments: crypto & NFT enthusiasts and art market figures. In line with the Grounded Theory Method logic, we developed individual sets of questions designed specifically according to the area of professional expertise and personal background of each interview partner. The order of interviews, their goals and reasoning are described in greater detail in Chapter 3.

Our primary research process was conducting and transcribing interviews, screening for highlights and gaps in knowledge areas. Then, we processed the findings and based on the information and ideas acquired, formulated the next desired interview partner's profile. To do this, we used our personal and 2nd degree network or reached out to professionals via social media to find subsequent interviewees, while repeating these steps until there was information saturation, i.e., when we strongly believed we had collected enough information to form a reasonable theory (Charmaz, 2006).

2.2 Data Collection & Analysis

The data collection goal was to extract personal experiences and thoughts from participants to then use these as building blocks to create a picture of the emerging market reality. The selected interview format was semi-structured, as this best fit our need for constant

comparison (Strauss, 1994) and inclusion of new topics based on ideas from prior interviews. It also allowed for a conversational style, which leaves more room for knowledge acquisition through more spontaneous, complete and sincere answers (McIntosh, 2015). All interviews were around 1 hour long (1 was less and 8 were longer) and were held via Video Call (except for 1 in-person), to establish a better contact with respondents. All interviews were recorded and then replayed and transcribed.

As proposed by the Grounded Theory Methodology, processes of collecting and analyzing data are non-linear. Thus, we used an Open Coding method to primary scan the data for most significant and reoccurring topics (Strauss, 1990). We then framed quotes indicating certain code in the table that can be found in Appendix 1 and repeated this procedure with all interviews conducted for this study. The interviews are also labeled with the colors: blue for the respondents from the tech and crypto industry; pink for the respondents from art industry; and purple for the respondents involved in both of the industries. These color codes will reoccur in Chapter 4 under the same rubric.

After completing the interview process and filling the data into the Open Coding Table, we proceeded with Axial Coding to then finally formulate our theory and tell the story of our data in Chapter 4.

3 Empirical Setting

In this part, we expound the data collection process, describing each interview partner, their backgrounds, reasons to be selected and how this leads to the next interviewee. As the topic is about decentralization, we were aiming to look for interview partners globally, in order to reach higher diversity.

As the literature review indicated, there is more availability and consensus over data pertaining to the traditional art market than the emerging NFT segment. Naturally, the first selected respondent was specialized in an NFT space. It was particularly interesting to learn about the market structure, trading procedures and most notable projects, so we looked for an expert working in the field of NFT market places. This interview shed light on many technical aspects, as well as penetrating the real-time dynamic of the market.

Interview 1 - Dominik Myczkowski

Austrian tech entrepreneur, crypto & NFT enthusiast based in Lisbon. Co-founder and CEO of the first fully regulated mutiBlockchain European NFT marketplace. He entered crypto world in 2013 as a miner and trader and later co-founded Crypto Skills Academy. He has also practiced hydromining and has been present on the NFT market as a collector since its formation. His NFT collection exceeds 1500 pieces and it is notable that he has been trading early NFTs of Beeple back in October 2020.

Following that and having some understanding of the tech player's approach, we wanted to gather thoughts of an independent artist strongly present in the NFT space.

Interview 2 - Ben Hopper

Israeli photography artist & crypto enthusiast, based in London and currently traveling. Ben Hopper started taking photos back in 2007. Today, he is a well-established independent photographer and crypto investor. He focuses on portraits and conceptual photography. He is famous for several projects that went viral and he has been featured in GQ, ELLE, The Guardian and many more. Ben's partners and clients include Akram Khan, Cirque du Soleil and Canon. He is active in participating and organizing exhibitions, as well as selling his works as NFTs via the OpenSea. Ben is a micro influencer on Instagram and twitter.

Then, in contrast, we wanted to talk to an artist that has no relation to tech whatsoever, but deep knowledge of art history, traditional techniques and very aesthetical approach.

Interview 3 - LoSi

A visual fine artist from China, Lo Si began his academic path in traditional art beginning at the Saint-Petersburg State Academic Art Lyceum. He then continued at Imperial Academy of Arts named after I. Repin at the painting department. In 2018 Si graduated from the faculty of easel painting under the direction of H.V. Savkuev. He continues to have a strong bound with the institutional art world and teaches at the university, while working on his individual pieces as an independent artist. His art works are in private collections and museums in China, Japan and Russia.

Lo Si was particular in his views on aspects of the art market. He has a well-formed his artistic personality while being a strong presence in the market over many years. Now, we wanted to have an opinion of younger artist who is in the process of building his image and choosing path on the market.

Interview 4 - Lukas Lovejoy

An emerging artist from USA. His was awarded a degree in Studio Art and Finance. Lukas is starting to develop in the direction of exhibiting and promoting individual sales, as well as collaborating with other creatives. He is curating exhibitions and artistic spaces in NYC.

As we have come across this topic many times while browsing NFT space, it became interesting to hear from an author of a project that focuses on combining art, Web 3 technologies and impact, capturing the multidisciplinary value in the NFT art.

This next respondent wished to remain anonymous because of various concerns arising from negative experiences with contextual mentions. According to them, reputational risks and lack of context moderation is a common issue of Web3 space.

Interview 5 - Anonymous Respondent

They are an internationally exhibited individual visual artist and documentary photographer of German-Ghanaian origins based in Switzerland. Their work was featured in Bloomberg and npr among others. They are a member of 6 different associations, among which there are

artistic ones. They had numerous solo and group exhibitions worldwide and is working on an individual DAO project which combines art with environmental impact. They are also a member of an artist residence as well as an investor in crypto.

Next, we wanted to get a bit more of a technical perspective and insights from a person equipped with most recent DeFi and NFT market information.

Interview 6 - Federico De Grandi

He is from France, but currently based in Lisbon. Federico De Grandi is a contributor to several Web 3 projects: Stake DAO, BlackPool and Rekt investigative journalism. He also used to work for Ledger hard wallet. He is a big NFT enthusiast and has been collecting them for a while, as well as investing in crypto.

Federico has mentioned a notable idea of motion capturing with NFTs, which has led to an idea of including body art in this study. We looked for someone independent, who has a lot of diverse experience and works with multimedia to interview.

Interview 7 - Irina Demina

Irina is a Berlin-based choreographer, dancer and curator of artistic projects of Russian origins. She has studied dance at several institutions in Russia and Germany. She is an author of multiple dance and multimedia projects, mostly individually produced. Irina finances her work through grants. Her last projects involved combining physical dance performance with motion tracking that was topped with generative design.

It was logical to seek the opinion of a significant figure from traditional art market. As mentioned in the literature review, out of all market players, auction houses are the validators, so we decided that an auction house representative would be the best option.

Interview 8 - Martin Böhm

Martin is and executive officer of the Dorotheum auction house in Vienna, Austria since 2001. After stepping in, he and his team have modernized and internationalized the organization, turning it Europe's largest auction house. Under his management, Dorotheum has become a heavily digital company. Per year they execute between 600 and 700 sales, 90% of which are done online.

Finally, we interviewed a member of several highly influential NFT communities to go into more details concerning the people and motivations behind most notable NFT projects.

Interview 9 - Zack Bakos

Zack is an international crypto enthusiast and entrepreneur currently based in Mexico and has Hungarian roots. He has been extensively trading cryptocurrencies for a fairly long time and his current NFT collection includes hundreds of pieces, including several very rare ones, valued over 100 0000$. Zack now specializes in Yield farming and coaching.

4 Findings and Discussion

The aim of our research was to identify key processes and players in the emerging rare crypto art market and to analyze overlaps with the traditional art commerce. This allowed us to paint a fuller picture of market components and gain better overall understanding. In line with the Grounded Theory Method, we formulated our Theory based on the data Coding process. As already mentioned, the Appendix 1 contains data snippets corresponding to the Codes. Now, we create categories to connect and group together the codes (Strauss, 1990). Our Categories turned out to be the following:

Market Features	Purpose & Functionality	People
-Overlap of the markets	-Future of market	-Collectors / Consumers
-Coexistence	-Drivers of NFT craze	-Community
-Problems & challenges	-Good project features	-Market players
-Bubble / Market Sustainability	-Value creation & meaning	
-Novelties		

Categories formed provided understanding of the prevailing aspects of the NFT market. Overall, we see a combination of technical and socioeconomic properties of Blockchain, as a regulatory technology; and aesthetic, historical and symbolic properties from the art commerce.

We did not group Categories into a Core Category as the Theory we are formulating resembles an entire framework of high complexity and we are dealing with an entire market structure. To formulate the Theory, we developed a model to map units identified and their relationships relevant to value creation of NFT art projects. We used the overall structure of Porter's Value Chain Model (Porter, 1985) as a base and took structural elements from the European Commission's Value Chain for Visual Arts Model (Figure 3) (European Commission, 2017). Category People would not have contributed to the visual clearance, so we dedicated a Venn diagram to separately show most relevant individual players, as well as entities and individuals who likely will not expand to the rare crypto art market.

We will further discuss in greater detail the NFT Art Project Cycle Model (Figure 4) and NFT Art Market Roles Diagram (Figure 5).

4.1 NFT Art Value Chain

First and most importantly, interviewees all generally agreed about the significance and potential of the emerging digital art form, how it will win market share and become acknowledged as an art genre. Core processes and activities, however, will differ from traditional visual art in several ways.
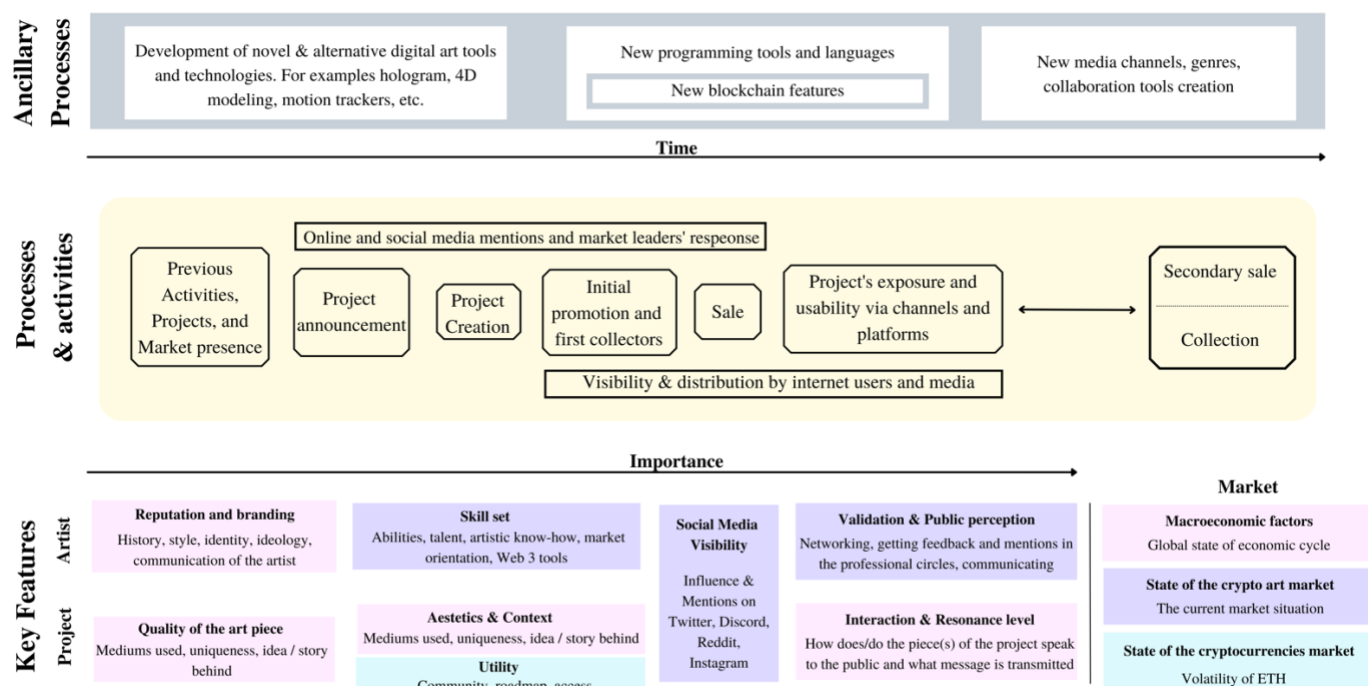

Figure 4 NFT Art Project Cycle Model (Elizabeth I Erchova, 2022)

Let us break down the model from Figure 4 to explain the Value Creation process of individual pieces and projects. First, let us look at the middle part (Processes & Activities) of the model, which offers a roadmap. We will also indicate points in a project's cycle where key features play a role.

Previous Activities, Projects, and Market presence
A Crypto Art piece begins its value proposition even before the Creation. The World Wide Web made information borderless and, as they say, the "Internet never forgets", implying that the reputation and "stainlessness" of the creator and their previous work is very accessible and even more critical to a piece's destiny, than ever before (De Grandi, Bakos, 2022).

Key features of a good artist should include a respected reputation and personal branding, integrity and a unique style. A successful artist is characterized by a strong skill set, including

usage of digital tools and the ability to create pieces that have artistic value and make his work truly unique (Böhm, 2022).

Project Announcement

The Internet became a space where all of us spend a great deal of time (Bakos, 2022) and naturally, we want to experience emotions that we usually get from real-world interactions. This makes an Announcement of an upcoming project an opportunity to create a first impression and get people excited about the project, making them think about it and creating associations (Myczkowski, 2021).

Online and social media mentions and market leaders' response

After the teaser goes online, it would be ideal for the upcoming art project to receive as many positive and excited responses as possible. Influential individuals' social media mentions, as well as the overall amount of internet users discussing the upcoming project foreshadows its success (Hopper, 2021).

Project Creation

Here artist decides on the entire concept and spectrum of the project: style, visuality, functionality, usability, rarity, etc. He decides on the tools that will be used, the degree of coding involved, minting process, project orientation, roadmap and whitelist if applicable, as well creating the internet identity of the project, such as the website or subsection on an existing website. When all underlying components are ready, the project is executed and prepared for release. Quality of the art piece itself is determined by the concept and story behind it, as well as execution (De Grandi, 2022).

Initial Promotion and first Consumers

Publishing the project and information about it online make the digital art (except for programmable, generative, etc.) as well as the project's properties visible to the internet community. The project enters the stage of active promotion, where it has another great chance to get attention. The artist and any other people behind the project should ensure the minimal necessary promotion for as many people to see the art piece as possible (Myczkowski, 2021). Artists should have an active online presence and interact with the audience as a part of building personal brand and promotion (De Grandi, 2022).

Visibility & Distribution by internet users and media

The internet community's interaction with the art piece is important for the project. People should resonate with it and media should have something they can pick up about it. This step involves all potential online art market players that might be involved in the digital art busines, such as online galleries and museums, where the piece can be displayed. The piece should transmit the message and tell the story (Bakos, 2022).

Sale

Depending on the rarity, quantity, chosen channels and whitelist presence, the piece(s) are sold within a period of time.

Project's exposure and usability via channels and platforms

Further online presence, public response and buyer's intentions will define whether and when the piece will reenter the market in subsequent sale under new price, or stay in a collection (Hopper, 2022).
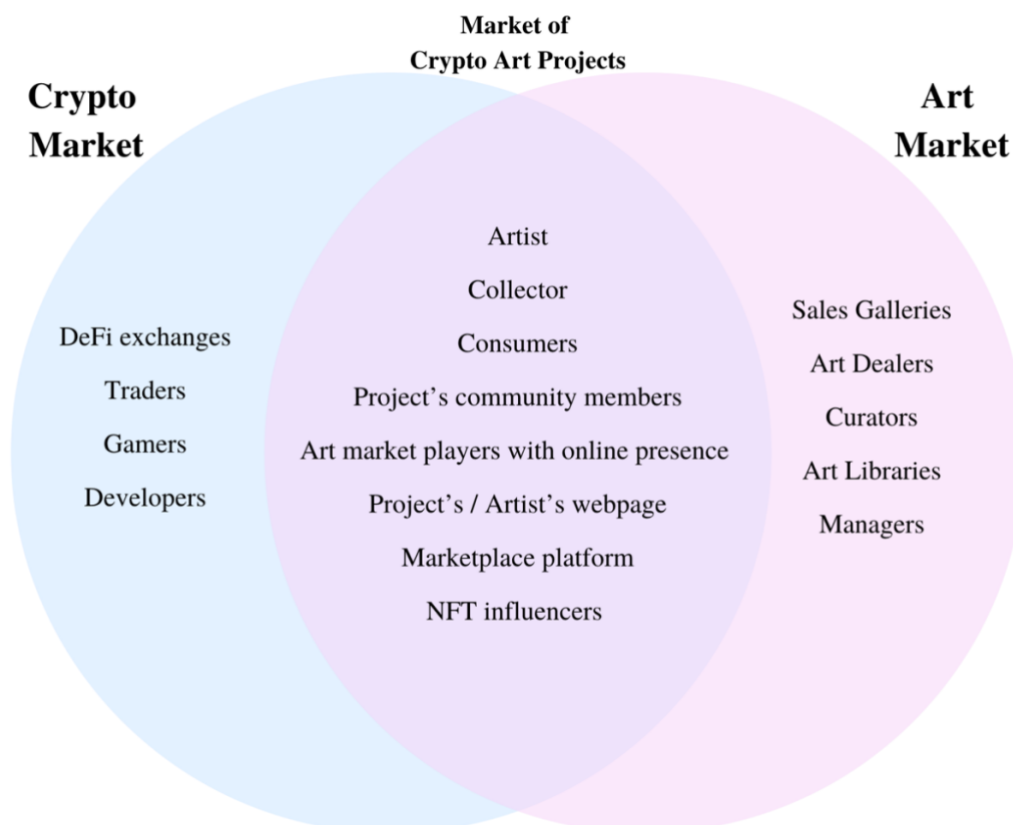

Figure 5 NFT Art Market Roles Diagram (Elizabeth I Erchova, 2022)

Now let us look at different roles of the NFT Art Market and discuss how it differs from the traditional art commerce setting, which we studied in section 1.3.

Artist

Without a doubt, the artist remains the central figure of the process, with even more functions associated with this role. Artists feel empowered and have a larger variety of options brought to them by the Web3 (Hopper, 2021). It is notable that those artists who are fluent with the market are changing their vision towards self-custody and not looking for galleries, curatorship or managers (Anonymous respondent, 2021).

Collector

The role of collector has strengthened in the Crypto Art Market compared to the traditional one. As we have discussed in the section 1.3, some intermediary players, such as auction houses and reputable museums, can act as validators; if they purchase a piece this is an acknowledgement by the art world (European Commission, 2017). Collectors in the NFT market undertake similar role of validators (Hopper, 2021). If a collector with many rare or famous pieces purchases a piece from a project, the project significantly increases in value (Bakos, 2022). This works in reverse as well: owning a reputable piece of art from a famous acknowledged collection provides legitimacy to the collector and positions him in the market (De Grandi, 2022).

Consumers

As discussed above, crypto art consumers are those users who engage with the project, even if they just see it online once. The coverage volume and overall perception of this group has strong power in defining project's success (Bakos, 2022).

Project's Community Members

This group of players is new and native to the market of NFTs. These are people grouped around the project according to their interests, tastes, networking goals or for other reasons that they might have to create a community (De Grandi, 2022). Communities can be very influential and selective, as well as inclusive and open (Bakos, 2022).

Art market players with online presence

In the section 1.3 we described the traditional art market players and their roles. There is a great chance of many of them migrating and integrating into the Crypto market if their roles are compatible with the new Value Creation Model and online format. For example, auction

houses and galleries with strong online presence are technically well prepared to host Crypto art and it would be logical to expect them to enter. It is just the matter of time, research and market stabilization (Böhm, 2022).

Project's / Artist's webpage

This instrument is practically a business card of any NFT art project of its author. It typically contains all practical information and visual concept.

Marketplace platforms

These players provide space for the trading, minting, transferring and displaying functions. The most notable and popular ones are OpenSea, SuperRare, Rarible, Nifty Gateway and others (Hopper, 2021).

NFT influencers

These are the collectors with strong portfolios, outstanding experience and strong Social Media presence. Twitter is an important platform, where these individuals share insights (Hopper, 2021). Similar to the Auction Houses and Museums of traditional art market, such individuals and entities are gaining credibility by owning valuable pieces, having a successful trading history and having access to exclusive projects, events and information (Bakos, 2022).

Art Market players

There are also several roles, that are likely not to migrate or diminish in power on the NFT market compared to their native art commerce. As marketplace platforms are multifunctional and have features that, in the online space, can replace functions of Sales Galleries, Dealers and Curators (Anonymous respondent, 2022). Art libraries are analog, physical spaces that provide archives of market history, which for the NFT market has been happening

Crypto Market

Similarly, there are groups in crypto space that will not storm the crypto art market. That is, mostly due to the fact of a less rational discipline, reliant on aesthetics. Developers are going play the key role in the Ancillary Processes of NFT Market, but are not likely to have direct stake in a Project's Market. Gaming and all players involved in the gaming sector are the core group of NFT market, and although it would be possible that there will be an overlap,

online and made available there. Managers' role will change in function and appearance, as their current usual functionality set is getting replaced with the ERC721 and similar cryptographic standards.

NFT gaming market participants are not expected to take active roles in the art projects (Bakos, 2022). DeFi Exchanges and Cryptocurrencies traders will have presence in the NFT market overall, but are unlikely to join art centric NFT projects if they are not oriented on short-term value gains (Anonymous respondent, 2022).

Now when we have dissected the process of value creation, let us outline the most significant differentiators that will likely separate digital from physical art.

4.2 Crypto Art = Project

Throughout this chapter Crypto Art outputs are mentioned as Projects. This is because of all the variables already mentioned, so using the term "digital piece" would neglect the remaining array of attachments. This has imposed a shift in perception differentiating NFT art from its traditional ancestor. As discussed in the Chapter 1, the most recent philosophical definitions of art imply "relative independence of aesthetics from other sorts of value" (Bourdieu, 1993). This paradigm is starting to change. The new generation of art consumers is more demanding and more self-oriented (Demina, 2022). They also start buying art at a younger age (Böhm, 2022) and their attention span is shorter due to the high volume of available content (Hopper, 2021). This naturally reflects new expectations towards consumable art. The importance of aesthetics behind the pieces does not seem to diminish. Providing utility and functionality along with visual beauty is embedded in the concept of NFT culture (Bakos, 2022). It is a so-called Ownership Economy, which is believed to be an important keystone when it comes to the Web 3 User Experience (Kogan, 2021). This is why the common statement "why buy if the download is free" is not correct when referring to Crypto Art projects. In fact, views and downloads of the piece enhance its price (Myczkowski, 2021). Traditional Art provides value to many people, for example daily Louvre traffic allows thousands of people to enjoy the Mona Lisa. NFT art pieces, however, provide value mostly to those who own or somehow interact with the piece. This is ironic because NFT art is so much more accessible. To sum up, the system of values of digital pieces is evolving from solely aesthetic to the utilitarian and from collective to individual.

5 Conclusion

In seeking to answer the research question, we collected interesting and diverse data. Although many of the details varied, there is a consensus over the fact that Digital Art, Web3 technologies and NFTs in particular, are here to stay and will disrupt the Art industry. The bottom line of this research is that the emerging NFT branch of the art market is going to substantially differ from all the genres we already have in the industry. Firstly, we are going to see high reliance on Blockchain technologies across all stages of the artistic and managerial processes of value creation. The value cycle of projects is tending to get shorter (Hopper, 2021) relative to traditional art commerce. It is expected that that consumer and collector groups will consist of more tech oriented, younger individuals (Bakos, 2022), expanding the art market's participant volumes and facilitating higher cashflows and the overall worth of the industry. The tendency to refer to the commonly acknowledged validators when seeking to access the value of project will remain an important notion of crypto art market (European Commission, 2017; Hopper, 2021). Managerial roles, on the other hand, could be going through the crisis, as there is a wider array of mechanics which can be replaced by technology.

For now, the greatest challenge of rare crypto art remains artistic value creation and proving itself to the established art world community. Due to the origins of the market and its early adopters, we are observing growth patterns that are rather comparable to a newly emerged crypto token or coin. This naturally implies that the speculators looking for quick gains and arbitrage opportunities are flooding the market, creating a bubble and synthetic valuation for many projects (De Grandi, 2022).

"Everything must change for everything to remain the same." - Giuseppe Tomasi di Lampedusa, 1958.

Crypto Art, without doubt, is one of the most exciting novelties that the art industry has experienced in a fairly long time. NFTs, along with the other emerging Blockchain applications are a fascinating technology disrupting and reshaping many industries. The most important conclusion, however, is that creation of NTFs as a technology does not define the destiny of the art market, and it is only a tool for creating objects of value. True drivers of the progress and change always have and always will remain the innovators.

6 Limitations

This paper has a number of limitations, which are important to take into consideration.

First of all, due to the limited amount of prior academic research in the area, the sources used for this research include material not only accredited scientific journals. However, in order to minimize the chances of informational errors sources have been double checked and acknowledged by the author to have sufficient expertise in the area of the information provided.

There are a limited number of expert interviews which potentially constrains generalizability of our findings. Future research into how NFTs will look beyond merely being an emerging phenomenon, the scope of this study, would be interesting. Also, a follow-on study could examine the particular factors that cause an NFT or succeed or fail, once there is a data set of historical information about how NFTs have performed over time.

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Glossary

Anonymous = use of pseudonyms allows artists and collectors to create, sell, or buy art while staying anonymous (if preferred);

Crypto patrons = crypto art is often collected by a group of savvy technologists and investors who got into cryptocurrency early;

Cypherpunk = individual advocating for widespread use of cryptography as a route to social and political change;

Decentralized = tools and guidelines are designed to reduce the power of gatekeepers and middlemen and increase the autonomy of artists;

Democratic = everyone is encouraged to participate;

Digitally native = artwork can be created, editioned, bought, and sold digitally;

Geographically agnostic = artists participate from all over the world;

Merkle tree = cryptographic summary of all the transactions the block within the blockchain contains;

Metadata = data about data (reference) stored on chain;

Metaverse = network of virtual worlds focused on social connection;

Mining pool = group of miners providing computing power in the PoW mechanism;

Node = copy of full blockchain transaction history on device;

Ownership Economy = an economic system where those who participate also hold an ownership or financial stake in it;

Smart Contract = self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code;

Appendices

Appendix 1: Open Coding Table

Code	Interview 1	Interview 2	Interview 3	Interview 4	Interview 5	Interview 6	Interview 7	Interview 8	Interview 9
Overlap of the markets	"There are similarities in the price history graphs of crypto and traditional art, but for traditional art it takes much longer."	"Art market and NFT market are mirroring each other. Art market is a pyramid scheme and it is also very much about who do you know and who you are related to. Same thing in the NFT market: a lot of big names got into NFTs and they had a lot of success."	"…digital art is a new game that the humanity found."	"In the context of actual art as in the search for beauty I don't really think it's [the NFT craze] doing anything, except for maybe cool algorithms that combine styles. In terms of creating opportunities for artists I think it monetizes well."	"Right now, there is no overlap of traditional art market and the NFT one."	"Proof of that authenticity is the most notable difference between the traditional art market and the crypto art market."	"Dance always appears as a very analogue story, as the digital technologies are associated with people being detached from their bodies."	"Auctioning, like the rest of art market, is the seller's market. Seller is in much stronger position because items are unique. Market is driven by the offer and not by demand (except for some cases on primary market)."	"I think contemporary art in context of NFT market is going slow because artists need to find a way of how they will provide value for the holders of their NFTs."
Coexistence	"There is no future of duplication of the real-world art as NFTs, rather, it would be the essentially digital pieces."	"NFTs are something that the art market does not know how to digest. Few institutions like Christies, that got in earlier, managed to do quite well, but generally I think it is in the adaptation stage. People are only starting to realize the possibilities of NFTs. But there is still a lot of uncertainty."; "Face-to-face interactions are important. I like digital stuff, but I	/	"I feel like Physical & Digital together will happen more."; "Crypto art is another branch on a tree [art industry] […] it won't cannibalize the traditional art market."	"Art is a gateway to this technology. [NFT]"	/	"I prefer to think of digital technologies as extensions of possibilities that human minds and bodies are not capable of. So not as a replacement, but as an addition."	"…crypto art is just a new medium, like sculpture or photography."	"I value all kinds of art and I don't think the physical touch and energy can be replaced, so I think the answer is coexistence."; "…real world art will always have its value proposition; digital art just has a different one and I don't think that one is better than the other."

		think it creates a big problem of disconnecting us. Metaverse is a lovely idea, but it is also a terrible idea.”; “I prefer to think that NFTs cannot replace real world art, because we are Tec Tile creatures and as much as we want to go to the Metaverse, we naturally need touch, we need the face-to-face connection.”							
Future of market	“The future of NFT market and especially its art segment is quite similar to the conventional world. [It is about] great software knowledge, like cinema 4D and blender, rending skills and making great product, be that video, clip, art piece, or any other interactions that have a story that can be sold. It has to be something that animates people to invest in this art long-term. This [kind of projects] are the future.”	“I am agnostic on NFTs. It could go anywhere, but I would like it to succeed, as many artists have the opportunities they’ve never had, like myself.”	“It could be possible that the idea of tangible art will be going through crisis in some 10 or 20 years, however, in 20 more years it will become actual again.”; “Art, as well as fashion and music, often repeats its own trends, recreating the patterns of the past, going in spirals.”; “I do not see anything changing that much in 5-10 years. In 20 yes, probably it will.”;	“I don’t see Finance Bros taking over the art industry.”	/	“…financial system is broken and there is too much money around, that people are looking to “park” outside of the areas of institutional influence. We are seeing migration of capital from assets of high inflation like real estate, bonds, etc.”	“I like the idea of NFTs as it is breaking the idea of superiority of some influential groups.”	“The relevance of digital art is not yet clear. Which is a pity.”; “I don’t see any dramatic change coming in the foreseeable future, I am even surprised by how little change we have been seeing recently. For example, when you look at the works by some art students these days, there are no digital projects.”; “I think NFTs and digital art is something serious…”	“Short- and medium-term predictions for the NFT market are difficult because there is so much uncertainty on the microeconomic level.”
Good project features	“Sustainable NFT projects are those where people either know or get	/	/	“NFT art is super branding-focused. It’s a game of psychology and	/	“…some pieces, like Cryptopunks will always be valuable as they	“…areas we used to neglect: the fact that some people are physically or	/	“NFT projects have to bring utility, unique features and community.”;

	"convinced that the consistency and durability in terms of creativity, "history-making", ecosystem expansion is present."			"how can you market the best."		"are a piece of history."; "NFTs will be a puzzle of financial world, puzzle of the cultural world: Boared Apes will be in movies, the collection will be a brand with rare items, like Supreme."	"mentally unable to be present in the theatre during a performance (people with disabilities, people with small children, etc. are detached from cultural process). Theater should be inclusive."		"Value of crypto art depends on: the quality of art, reputation and community of artist, vision and reason for person to buy it."
Novelties	"It [digital art market features] allows for art to become interactive. To let community follow the story – "feed" them with stuff."	"The possibility of the NFTs that I am most excited about is the opportunity to collaborate with other artists from the enemy countries of Israel."	"Crypto art market is much easier to enter, but the institutions and academic art is something that has been shaping for a long time."	"It [NFT market] gives more opportunities to artists that know how to use social media."; "…cool algorithms that combine styles."	"Theoretically, the potential of NFTs allows for serious disruption of systems that just don't work for us anymore. It's a chance to reconsider what we believe to be valuable and what an artist's life can look like."	"Now there is an opportunity to embed IPR into an NFT, for example for music"; "The beauty of Web3 is that the building blocks are being created and further someone can use these building blocks.";	"Digital stages are a step towards the inclusive theatre…"; "… virtual work gives one a bit more autonomy."; "I think such [NFT] technology has a potential to change the access to information. If we start consuming more artistic content on the daily basis, as a part of every-day life, we will see the change."	"…reach out in the online format shifts the visibility, additionally the sales rates go up, as there are more bids on the same piece, as there is more traffic on the website compared to auction hall."	"I think there are 2 important things when it comes to art and NFTs that real-world art doesn't have. Number one is being able to verify the original. Secondly, it is a possibility for self-custody, meaning that you don't have to rely on third party…."
Problems & challenges	"Offers that you see on OpenSea a lot of times are made by bots who are trying to arbitrage."	"[…] the emissions and energy consumption of Ethereum […] just scared me and a few of my friends who wanted to get in [NFT market]. I didn't want to be a part of what's bad for the environment."	"Art pieces can be objects of corruption."	"…right now, the crypto art does not possess cultural value, as there are too few owners."	"One of the biggest challenges of the NFT is that people barely move outside of twitter and Discord [in search for information]."; "There is a problem of harmful stuff being represented by monetary value on chain."	"…half of the current market are "flippers" and the bubble burst is going to eliminate such practices."	/	"Jumping in to make quick money is negative and is killing the [NFT] wave."; "A lot of things aren't clear related to country laws, IPR and implications of owning an NFT of some physical, especially state-owned art."; "…ecologically blockchain is dramatic."	/

Collectors / Consumers	"Crypto crowd is the most significant NFT customer segment, as they have been holding their eth since the time it was worth way less, so the buying NFTs is cheaper for them."	"In the NFT world, you get 1 collector to buy your art, and then his friend will buy your art, and then his friend will buy your art."; "A lot of the creators are the same, but collectors are new."	"In recent years [in China] art objects have become one of the ways to invest money for long-term."	"It already was the case that financiers from wall street were buying expensive art before NFTs."	"Collectors of my NFTs do not have any connection to the traditional art market whatsoever. For artists it's different, as they are more of disruptors. They are able to take a humility it takes to come into a new space and start from scratch, because nobody cares about your CV."	"…individuals aiming to belong to a certain group."	"…millennials are a very individualistic generation – everyone is a unique figure and they want to claim rights for everything, they want to be in charge."; "…awesome that the new generation of art consumers are not going to be associated with this "bohemian" lifestyle, that art will be a public and widely available good. Art is for everyone."	"Moving most auctioned pieces online has significantly changed the customer base to more young individuals to participate in the auctions."	
Bubble / sustainability of the market	"There is a bubble and we will see an insane burst. People with fiat, short-term orientation, that are trying to speculate will lose money."; "Many people these days have this illusion that NFTs are some sort of golden horses to ride and it is very simple. It only takes to put any picture on the OpenSea and then I can make thousands and millions of moneys. This is obviously no how it works."	"NFTs are even faster money than crypto."	/	/	"The NFT market dynamic is not sustainable and we are approaching some kind of peak, but what do I know."	"…there is an NFT bubble since around august 2021."; "Current state of market is not sustainable. People selling hopes dreams." "There is more speculation than another asset classes because it is fast and global."	/	"…we sell values. I do not deal with NFTs because I cannot vouch for the price it might have tomorrow- might be high, but might be 0. […] We, who have such long history and trust of our clients, have to be cautious."	"Buying NFTs solely based on the value is gambling and not investing."

Community	"As soon as community is involved – it has a development potential."	"…so, it is very organic – you build your network like that. It about the trust and value: if you are on the know- you have the value."; "What I realized when I got into it is that you need to know people and be connected to the community."	"…most of his sales [traditional art pieces in China] happen through personal networking- going to dinners etc."	"Crypto art is a symbol of an attempt to move the world online."	"…significant acceleration of funding work based on our society. Not on the institutional peer-reviewing entities, but on our society from every corner of the world, being able to form completely new communities, not based on a monolithic culture, but based on common interest or goal. I am excited for the new communities, that are not grown from the Eco chambers of what we look like, what we belong to, who we believe in."	"NFT is not just art, it's the community behind it."; "Owning an NFT makes the owner belong to the group/community formed by certain principle: be that same taste, same set of values, or whatever else that brings group together."	"I am very inspired by the blender editing tool, which is independent, open-source and free. It gives a great sense of community…"; "I like everything related to the community, decentralization and distribution of power."	"…only owners can bring pieces to auction";	"Artists need to find way to build communities around their brand and around their NFTs, otherwise they will find it difficult to survive in this space."; "Quality of community is defined by contribution, diversity and quality of skillsets, knowledge, support, energy. The purpose of such community is to grow the value of collection."
Value creation & meaning	"Value creation process behind NFT market is a mixture of stock and art commerce. […] People collect because they like it. They trust the artist, they like the artist, or similar soft reasons, beyond buy/sell."	"The value creation process has to do with connections, the network that you have. Because the trusted influencer has bought an Ape, other people will buy it as well and it is going to raise the [collection's] value."; "NFTs can create emotional attachment of their holder"; "We are living in this funny celebrity culture. I am trying to get my art sold by the NFT	"Success and valuation of the artist depend on many factors. Firstly, it is the economic growth of the country or area. So, it goes hand in hand with the time and economy. It happened in the US in 60s and in China around 2006."	"…posting a lot on SM could contribute to the value creation."	"…aim to bridge the gap of institutional art realm and making impact in an illustrative way through the art"; "I think it's [NFT world] a way for artists to apply their imagination, creativity and whatever other skills we might bring to the table to make our art work for ourselves and for the world."; "The cultural value of crypto art will be determined by the pieces and	"Owning an NFT is a status thing, like wearing a Rolex in real life. It legitimizes the owner in the internet space and indicated their belonging"; "The value of NFT will be realized later, when the importance of digital identity will be more realized and acknowledged."; "A lot NFTs are gaining value because of influencers collusion on	"Not everything has a direct application. People are buying history; they are buying an idea. Who owns the movement? Everyone?"	"…knowing price and trade history of the piece is not crucially important as it is not how the value is accessed. Price is determined by the customer's WTP and the estimate comes from experience of similar works in most recent times. […] … artistic value, beauty or meaning of art piece."	"Utility is why most NFTs are bought, and I personally don't buy anything that doesn't have utility behind it. […] Whether it will be an exclusive contact with the artist, or events access, or participation of live events access, etc.";

	"influencer collectors in order to rise the value."; "I am searching for the NFT collectors and influencers via Twitter. NFT sales on twitter have domino effect."				"projects that will make it [through the bubble]."	"twitter, where they all buy in to the collection to pump the value."			
Market players	"Galleries are key players; they allow artists to buy in and digital galleries are similar"	"I have never worked with agents because they required commercial experiences, which I did not have."	"Most players of traditional art market won't enter NFT market."	"I think it's too hard to break into an existing system, where everything is just about being fancy and stuff. [About galleries & curatorship] I think it's better for me to bet on creating my own system and marketing."	"Since the NFT space opened very new perspective on how my career might evolve and accelerate, I am not even sure if the gallery representation will be anything interesting to me."	"…influencers on twitter; marketplace platforms like OpenSea, Rarible, who can also undertake a museum role; NFT lending platforms: NFT as a collateral and money borrowing on top of it."	"…dependence and high degree of reliance on institutions [project sponsors]"	"…quality in art means approval in the exhibitions, museums; taken in by the art world, sold by big galleries."	"Most people in the NFT space are measuring their portfolio in ETH, as most people [in the space] don't care about the short or even mid-term price volatility, because as long as the underlying NFT asset is strong, ETH is going to survive over time."
Drivers of NFT craze	"Many people these days have this illusion that NFTs are some sort of golden horses to ride and it is very simple. It only takes to put any picture on the OpenSea and then I can make thousands and millions of moneys. This is obviously no how it works."	"Money is a huge component. Money is the main component. But you have 2 sides: collectors and artists. Artists just want to do more art and support other artists. Collectors, on the other hand, are aiming for the money. But all collectors that I have dealt with have bought things because they actually liked it."	/	"It's [NFTs] special because everyone agrees that it's special.";	"I do believe that NFT craze is solely driven by the amounts of money there is to be made."	"It legitimizes the owner in the internet space and indicated their belonging."	/	"Jumping in to make quick money…"	"Time being spent in the real world and time being spent in the digital world."

Blue = NFT market figure

Pink = Traditional art market figure

Purple = NFT & traditional art markets figure