

NFT Art World: The Influence of Decentralized Systems on the Development of Novel Online Creative Communities and Cooperative Practices

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ABSTRACT

Reporting on the Non-Fungible Token (NFT) ecosystem overwhelmingly focuses on the community that drove its growth and price volatility, gaining widespread media attention in 2021. This overlooks the communities developing novel creative practices on NFT platforms. Interviews with 16 creatives utilizing NFTs reveal a vast Art World: networks of distinct communities maturing into cooperative ecosystems with unique artistic subcultures, philosophies, and interactions. We observe unique qualities of these decentralized distribution platforms and identify patterns of activity comparable to those of traditional art worlds. We identify how aspects of these systems might subvert, or replicate, existing systems of power, value, and access. The impacts of policy and platform design on online creative communities in the NFT Art World carry valuable lessons for developers of digital interventions into the creative industry, exemplifying pertinent considerations for the future of creative labor and cooperation online.

CCS CONCEPTS

- **Human-centered computing** → Collaborative content creation;
- **Applied computing** → Fine arts; • **Social and professional topics** → Centralization / decentralization.

KEYWORDS

creativity support, online communities, decentralization

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1 INTRODUCTION

"A lot of people, when they think of NFTs, they just think of apes and monkeys, and they have no idea that there's this amazing underground art movement happening here." (P12)



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Art typically refers to an artifact of *art-making*, and *the artist* is the actor associated with the bulk of that art-making labor. However, beyond the individual, art functions in society as a product of collaborative activities — art sociology offers a comprehensive method for analyzing these activities by investigating the “Art World” around the artist [5]. An Art World’s collective infrastructure supports three interdependent systems of activity: art creation, distribution, and evaluation (where the meaning of the art is defined within community-constructed value systems.) These activities are integral to art-making within society, and yet the artist often has limited control over the majority of the interactions that enable and define the role of their creative artifact in society.

Production and evaluation of art often happens online. Art Worlds are thus shaped by the design of the online platforms that host their activities. Platforms can support the cooperative activities of an artist’s *support network* and the *socio-artifact network* of interactions between actors and the creative artifacts themselves [9]. The rapid proliferation of Non-Fungible Tokens (NFTs) as a means to signify and trade ownership of digital assets, particularly art, has potentially shifted the roles of content distribution platforms. While public reporting has largely focused on financial speculation around high-visibility NFT projects (e.g., [57]), we are interested in investigating how online platforms built around NFTs give rise to an Art World that changes relationships between art-making, distribution and collection.

In this paper we describe our investigation into NFT platforms as sites that facilitate the cooperative activities of artist and artifact support networks. We trace this NFT Art World through interviews with 16 creatives actively utilizing NFT platforms. Our contributions extend a line of research tracing the impact of emerging technologies on the design of software platforms and tools, and, through these interfaces, the subsequent impact on people and society. Recent work has considered the role that distributed-ledger technologies could play in restructuring communities, and the potential socio-political consequences [10].

As a rapidly developing space, studies of how communities using blockchain-based technologies function in practice are naturally limited. Research on the NFT ecosystem has often focused on financial speculation and the subset of “power-users” who gain or lose the most from this speculation around NFTs [27, 65]. This overlooks sub-communities of actors developing novel creative practices and communities using NFT platforms, and that continue to mature as cooperative ecosystems with distinct artistic subcultures, values and motivations. The results of our study carry broad implications for the future of creativity support tools and the design of online

creative community platforms. Contributions from the analysis of our interview findings include identifying the interactions that make participation in the NFT Art World a satisfying, empowering choice for the artists we interviewed, and consider how the patterns observed in these spaces might replicate, amplify, or undermine patterns familiar to the production systems of traditional art worlds and in other creative communities. Finally, we relate our users' experiences with NFT platforms to platform design features, with the aim of informing the design of participatory platforms, sites for online creative communities, and future interventions into the creative industry.

2 BACKGROUND

In this section, we provide fundamental background information required to have a basic working understanding of the technologies relevant to discussion about the Non-Fungible Token (NFT) space, as well as a brief history of NFTs for digital art.

2.1 Underlying Technology

NFTs (Non-Fungible Tokens) are unique digital assets. They use a distributed ledger, or blockchain, as a means of verifying ownership and provenance. NFTs are created as digital tokens, which may contain the digital artwork itself, or a link to it on another host, and are stored on the blockchain. Each NFT is assigned a unique identifier, and ownership of the NFT is recorded in the blockchain ledger. The decentralized public ledger provides a means for creators, buyers, and sellers to verify the artifact's authenticity and transaction history, and to transfer ownership. The blockchain can also hold *smart contracts*, stored programs that automatically execute terms of an agreement between multiple actors. Smart contracts give creators the ability to choose and encode a particular set of rules or agreements, and to systematically ensure the execution of those rules in practice, allowing actors to design governance systems that suit their specific interests or cooperative needs. For example, a smart contract can state that the original artist should receive a specific percentage of royalties each time an NFT is re-sold.

Cryptocurrencies are often the medium of exchange for NFTs; some cryptocurrencies, such as Ethereum, create the underlying technology for NFTs on certain networks. However, it is possible to use traditional currencies to trade on some NFT platforms.

2.2 History

NFTs emerged in 2014 as a proof of concept for “monetized graphics” by multimedia artist Kevin McCoy and entrepreneur Anil Dash [47]. According to McCoy, “The NFT phenomenon is deeply a part of the art world... It emerged from the long history of artists engaging with creative technology,” [58].

Public attention and rapid growth occurred some years later, centered around digital collectibles such as CryptoPunks in 2017 and the Bored Ape Yacht Club, the top-selling NFT project of 2021 [29]. The market has been characterized by high volatility. A frenzy of speculative interest began in 2020 with the overall value of the NFT market eclipsing a billion dollars in 2021 [39].

The ecosystem of evaluators and investors purchasing, speculating, and hoping to ultimately profit off of collectible NFT assets

vary from start-ups to blue-chip auction houses and major corporations [3]. However, the NFT market was also rife with scams and security problems [24, 37]. The NFT market lost significant value over the course of 2022 [46]. The collapse of multiple cryptocurrencies and the downfall of crypto-exchange FTX may have contributed to a drastic plunge in confidence in the technology.

To sum, a technology that was initially intended to support artists became an emblem of financial speculation [13], setting the stage for a re-evaluation of the role NFTs can realistically play in a contemporary Art World beyond opportunities for speculation.

2.3 Energy Consumption

As NFTs are often traded using decentralized finance networks, environmental concerns regarding energy consumption influence the development of NFT systems and communities. These systems change rapidly; accurate, updated information is often limited, and issues in comparison abound, including disagreement on what constitutes a comparable “transaction” across networks. Nevertheless, we compile publicly available energy consumption estimates and comparisons between decentralized and centralized finance networks in A.1 and highlight some relevant aspects here.

Ethereum, a prolific cryptocurrency option for NFT trading, recently transitioned from a Proof-of-Work (PoW) system to a Proof-of-Stake (PoS) system in a move referred to as “*The Merge*.” This significantly improved network sustainability, reducing Ethereum energy usage by 99%. However, this change was implemented in September 2022, well after the 2021 peak of popularity and activity. [16, 33, 64]. ***Pre-Merge Ethereum energy consumption was at least 200,000¹ times that of Tezos***, a network that has used PoS architecture since its inception in 2018 [2, 61].

In conclusion, Ethereum accrued a great environmental “debt” during the “NFT craze” of 2021 and gained an arguably commensurate reputation for energy inefficiency – meanwhile, alternative options (like Tezos, among other PoS currencies) have been available to use with comparatively minor environmental impact.

Although certain design choices can improve sustainability and many platforms continue to develop towards this goal, blockchain-based systems, whereby data is replicated and processed over thousands of participating devices, unavoidably face significant scaling issues and energy efficiency challenges, especially when compared to established centralized alternatives [64]. These factors can play a role in an actor's choice to participate on NFT platforms and influence the development of the subcommunities we observed.

3 RELATED WORK

In this section, we discuss both background and related work about art worlds, online creative communities, and the design of tools and platforms that support cooperative creativity, as well as prior HCI investigations into the use of blockchain applications and related technologies.

¹[2] estimates a difference in energy consumption between the two networks as great as 1.5 million. [33] reported Ethereum's annualized energy consumption as 22.9 TWh/Yr, [55] reported between 23-94 TWh/Yr, and Ethereum's website itself reports 78 TWh/Yr. We used the most conservative of estimates (22.9TWh/Yr) to compute the 200,000x value comparison to Tezos, and used the average of these estimates (53TWh) in Appendix A.1 This wide range in values is likely related to the network's various peaks in activity and size, which lead to radically different annual estimates depending on when and how the measurement is taken.

3.1 “Art Worlds”

Howard Becker’s “Art Worlds” theory describes art production as a cooperative network of activities [4, 5]. *Creation* activities cover the production of art and includes the tasks of artists, but also that of assistants, suppliers, etc. *Distribution* activities describe how art is made available to audiences. This can include exhibitions, sales, publishing or streaming. Distribution in traditional fine art worlds is often carried out by galleries or auction houses. *Evaluation* activities establish the value or meaning of an artifact. Some of these tasks may be reserved for actors recognized by the greater community for their evaluative expertise, like curators and critics. The reception and evaluation of a piece can then impact the artist’s ability to create and distribute work. If artists cannot financially support their art-making by distributing artifacts alone, they may alternatively elect to offer their creative skills as a service, e.g. in commercial art, graphic design, or photography.

3.2 Creative communities and collaboration online

Creativity research has a long lineage in HCI. Frich et al. provide a historical overview of two decades of work [21]. Contributions include both empirical studies that describe creative processes (e.g., [50]), and concrete Creativity Support Tools [20, 59] that turn such insights into interactive software artifacts. Chung constructs a design space of CSTs from a review of this literature [8].

While some research targets individual creative practitioners, others focus on studying the interactions between actors in a creative community and identifying the roles of different stakeholders in the cooperative network. For example, Luther et al. investigated patterns of leadership, including distributed leadership, and community practices across different online platforms for creative collaboration [42–44]; Iaffaldano compared collaboration in engineering and art [32]; while Cook et al. and Lampe et al. characterized patterns of participation in online communities [12, 38]. Kraut and Resnick used an evidenced-based, social science approach to make design recommendations for building successful online communities [36].

Other approaches include experimenting with the design elements of a creativity-supportive platform and observing the subsequent impact on community interactions, leading to an understanding of how platform design can influence and support cooperative activities [34, 35]. Chung’s framing focuses on larger artist support networks [9] around art-making and also draws on Becker’s Art Worlds [5] for conceptual grounding. We extend this focus on artist support networks and contribute a particular analysis of such a network around an emerging NFT Art World.

3.3 HCI and blockchain

Previous HCI investigations have considered how applications of decentralized ledger technologies might impact communities. This includes studies of the perceptions of Bitcoin across users and non-users [25] and discussions of the role that distributed-ledger technologies might play in restructuring communities, as well as the potential socio-political consequences [10].

Frohlich et al. [23] provide an overview of HCI research of blockchain and cryptocurrencies from 2014 until mid-2021. Their

analysis predates several effectual events in this rapidly developing space, including the somewhat recent and impactful market *crash*.

Several studies of crypto-asset users identified challenges faced by the community, including difficulties for first-time users and security behaviors taken in response to fear of betrayal, malicious attacks, and other perceived risks [1, 22, 24].

Studies have also pointed out major issues with the NFT market that contribute to inaccessibility, including expensive fees, scam risks, major gaps in understanding, and ethical concerns about environmental impact [3, 14, 27]. These previous investigations have also acknowledged NFT platforms as a space for creators whose modes of production might not be recognized by other art communities; they observed evidence of the emergence of artist subcommunities, including some that might be sustainably utilizing the platform for small transactions and taking advantage of certain identified benefits, including protecting provenance and earning royalties on secondary sales [3, 10, 14].

However, several of these investigations perceived the space as driven by an insular community where “power-users” congregate; for instance, participants in the Bored Apes Yacht Club Collection frenzy or communities that were influenced by the value of such collectibles. This contributes to a characterization of the NFT community and their motivations as part of a culture far removed from the cooperatively creative art-making activities that might characterize an effective artist support network [7, 14, 65]. Notably, the data-gathering of a number of these previous studies coincided with the peak of attention and speculation around NFTs, and thus may be not be reflective of “steady-state” usage patterns.

In 2023, we have a perspective on NFT platforms and the communities around them that places both “hype” and “crash” in hindsight. Our study aims to take advantage of this perspective, to observe how active community members perceive NFT platforms, and identify factors that motivate continued cooperation in the NFT space. Through this investigation we consider whether there are features of NFT platforms that might contribute to its original promise of serving artists, or other features of interest latent in the design of NFT platforms, and consider the broader implications for HCI and the design of creative and participatory spaces.

4 METHOD

In this section, we describe our recruitment process, interview procedure, interview coding methods, and participant backgrounds.

4.1 Participants

Potential participants were identified by searching for accounts on NFT platforms including Opensea.io [53], SuperRare [60], Foundation [19], and Objkt.com [52]. Users with contact information publicly available on their accounts were sent a recruiting message.

To recruit a second cohort of creative practitioners, we used snowball recruiting; we provided information to our enrolled subjects to pass along to others in the space. This second strategy seemed to significantly improve response rates. Scams are common in the NFT and cryptocurrency community [37], so community members spread precautionary tales and are reasonably wary of phishing messages or potentially compromising links; we experienced this wariness firsthand and discuss the potential impact on

recruitment in the Limitations section. Contacted individuals were overall more willing to respond to messages after perceiving that the study had the trust of other members in the community.

4.2 Interview Procedure

We conducted semi-structured interviews over Zoom from September 2022 through January 2023. The interview process and a list of questions were pre-written in a script to ensure consistency across interviews. The interview questions focused on the participant's experiences on NFT platforms and their perspective as a creative person functioning as part of the NFT community.

Each interview lasted for roughly 60 minutes. Later the audio recordings were transcribed to text for interview coding. Each participant was compensated with a \$20 Amazon Gift Card for completing the study.

4.3 Interview Coding

We started with open coding to generate labels from the interview responses and several themes emerged from participants' views on each topic. We then utilized a framework proposed by Mechant [48] for analyzing interactivity on Web 2.0 platforms; this twofold social framework takes into account the objective features of website structure together with the way users functionally used and experienced platform features.

We assigned codes that objectively describe the use of features afforded by NFT platforms and blockchain technologies. Then, we assigned interpretive codes to data that provided insight into *how* and *why* these features were used, to relate aspects of platform structure to user's subjective experiences and motivations. Finally, we assigned thematic codes to examine patterns of activity on an interpretative level. We organized these patterns into a categories of creation, distribution, and evaluation activities, allowing us to compare the interactions taking place around NFT platforms with those of comparable Art World systems [5, 9].

4.4 Backgrounds

The mean age of our participant pool was 34 years old. 12 identify as men, 3 as women, and 1 as non-binary. 12 participants have an educational background in the arts, and 4 in STEM. See Appendix A.2 for a table of participant data.

5 FINDINGS

In this section, we present the findings that emerged from our semi-structured interviews with our 16 participants.

5.1 A Spectrum of Subcultures

The NFT Art World is not a monolithic community; it consists of multiple subcommunities that often overlap, but overall comprise a multitude of distinct qualities and motivations. These communities are founded by, and congregate around, platforms that support their particular values, subcultures, and styles of interaction.

We identified several NFT platforms with culturally distinct practices and platform design choices that each attract actors with certain values and needs, creating the setting for the formation of sub-networks. There are many different NFT platforms; here we have chosen a few that represent a wide gamut of subcultures and

broadly describe the qualities that distinguish and stratify their respective subcultures and communities.

5.1.1 Exclusivity: SuperRare. SuperRare is an exclusive platform built on the Ethereum blockchain; access to publish artwork to this marketplace is granted only via selection by a committee of curators [60]. The platform also uses a form of decentralized governance – a special SuperRare curation token gives an actor the ability to vote on platform design decisions. Subsequently, the selection of new artists is decided via a community review and voting process.

As an Ethereum platform, access to collection power in this space carries a financial barrier to entry due to significant transaction fees, as well as a potential ethical barrier for individuals deterred by Ethereum's reputation of environmental impact. There are other platforms that use similar selective curation processes; we use SuperRare as a premier example. Participants drew parallels between experiences on these platforms and the elitism and exclusivity of the traditional gallery world, where there is a long history of using art trade as a mechanism to earn or purchase cultural power.[6].

“SuperRare is the number one curated platform for digital for fine art, NFTs, or fine digital art in the world. It's the hardest to get onto... SuperRare is just ultra challenging, and just because you get on there doesn't mean you're going to succeed.” (P5)

5.1.2 Collectibles: OpenSea. OpenSea is an NFT aggregator and platform that supports several major cryptocurrencies; it is largely dominated by Ethereum transactions. As the largest active NFT marketplace, this space was highly influenced by the success of the CryptoPunks and Bored Ape Yacht Club collections. Participants continue to perceive OpenSea as dominated by commercially driven “pop art” and “collectibles.” In 2021, sales of NFTs explicitly labeled as “collectibles” more than doubled sales of “art” on the platform[65].

“There's an interesting culture on OpenSea that's not necessarily wholesome. That gamification, PFPs² and all that... there's sharks in the water and you're gonna find that on SuperRare, too, but the curators on [SuperRare] have done a fantastic job at curating who gets entry to release work.” (P5)

“I minted on OpenSea in the early days because everything was so Wild Wild West. Now I kind of regret minting there, and it's very hard for me to burn everything³ because it's on Ethereum, and it costs gas money every time to burn” (P12)

This space does not limit any kind of artist from utilizing the platform and is widely used. However, its commercially driven “wild west” culture and associated fees, including a 2.5% cut taken by OpenSea on all secondary sales[54], can serve as deterrents.

5.1.3 Community: Objkt.com, Hic et Nunc & teia.art, fxhash. Objkt.com is the largest NFT platform using the Tezos blockchain [52]. The screenshot shown in Figure 1 features a search of Objkt for works released with the Creative Commons 0 (CC0)

²PFP commonly refers to “Profile Picture” collectibles.

³Once something is published on the blockchain, it is impossible to completely delete; “burning” describes the best option for destroying an NFT by making it virtually unrecoverable [28].

license. The price of the Tezos cryptocurrency is relatively inexpensive and stable⁴. By comparison - Ethereum transactions incur “gas fees” proportional to network activity, such that transaction costs can widely fluctuate and become cost-prohibitive at times of peak activity. We discussed in 2.3 other impactful differences between the Ethereum and Tezos networks. Although Ethereum’s instability and energy consumption are now reduced “post-Merge,” its larger network size still contributes to a greater overall energy consumption and slower, more costly transactions and fees compared to those of “smaller” networks – these factors continue to play a role in influencing the community perception of different currencies and the platforms that choose to center them.

NFT platforms that follow so-called “CleanNFT” practices (e.g. utilizing a PoS cryptocurrency like Tezos) are more appealing to users with environmental concerns, less financial resources to dedicate towards NFTs, or who consider the associated accessibility and democratization fundamental to the community culture they wish to participate in.

“Tezos is rooted in the underground... it attracted a lot of people with that with a certain kind of ethos... You don’t really have the same sense of community on other blockchains. Tezos artists will sometimes go to ETH⁵ ... But really, the community always is around Tez... we go out and bring community to other places, not the other way around.” (P12)

“It’s almost a counterculture sort of mood on Tezos... it’s owned by the artists.” (P13)

These qualities have influenced the creation of other platforms using the Tezos currency, integrating its associated values into the system designs. 9 out of 16 of our participants mentioned a now defunct platform called “Hic et Nunc”, a once prominent art-focused community platform on Tezos that “attracted a lot of people who were serious about art, not just about speculation” (P15). It serves as a cultural touchpoint that participants used to exemplify the value of decentralized data ownership:

“When Hic et Nunc got shut down, if that had been a normal website, then that would have been the end of an entire year’s worth of my art, ... within 12 hours, there was clones of the front end running. And all of the data was, of course, still available ... having that control and ownership over my own portfolio really matters. ... That really was a practical lesson in decentralization for a lot of people.” (P11)

“What was kind of beautiful about the fact that it shut down was that, well, all the works were unchanged, so it didn’t really matter. And new platforms emerged. So it’s really about the work, where the people go and where the community goes... it’s resilient towards any centralized problems.” (P15)

A prominent fork of Hic et Nunc lives on as *teia.art*, an open-source Tezos platform that is cooperatively owned and maintained by its

⁴“Minting” an NFT via Tezos typically costs a fraction of 1 unit of Tezos which, at time of writing, is valued at \$0.89 USD. It has fluctuated between \$0.70 to \$2.32 in the past year.[11]

⁵Ethereum

community, and that describes itself as “a collective, aligning under the values of sustainability, accessibility, and equity.” [41]

fxhash is a Tezos platform specialized for publishing digitally native work, catering especially to generative art and creative coding. It provides a framework where artists can publish generative code directly, and that enables others on the platform to run the code, generate unique outputs, and publish those pieces, which even in trade will retain a record of its origin and distribute royalties according to the creator’s wishes.

“[A] reason why I stick with NFTs and why I feel they really enabled me is, generative art makes way more sense as an NFT on fxhash than it really does anywhere else ... my whole portfolio, including static JPEGs, GIFs, videos, even interactive code that’s basically a video game, it all lives in one place.” (P11)

5.2 Supporting Art World Activities

Here, we describe how NFT platforms facilitate the activities of a cooperatively functional Art World, and how platform features influence actors, their processes, and their artifacts in creation, distribution, and evaluation activities. We also compare the NFT community’s practices to those of existing spaces.

5.2.1 Supporting Creation and Collaboration. Participation on NFT platforms can influence artists’ creation activities in several ways, including supporting artists socially and financially in their ability to create more artwork, experiment with new styles and formats, facilitate effective collaborations, and pursue creative freedom.

13 of our 16 participants were fulltime artists at the time of their interview. This includes P13, who considers NFTs a main source of income while retired. 8 of those 13 artists said that participation in NFTs directly enabled or helped to enable a fulltime art career, and 3 said that NFTs provided creative freedom, by allowing them to pursue a personally driven art style, for instance. The 3 participants who were not fulltime artists at the time of their interview included P7, who said NFTs allowed them to dedicate much more time to personal art practice and supplement their graphic design and teaching career, P8, who is currently a fulltime game development student, and P11, a fulltime engineer who uses NFTs as a hobby:

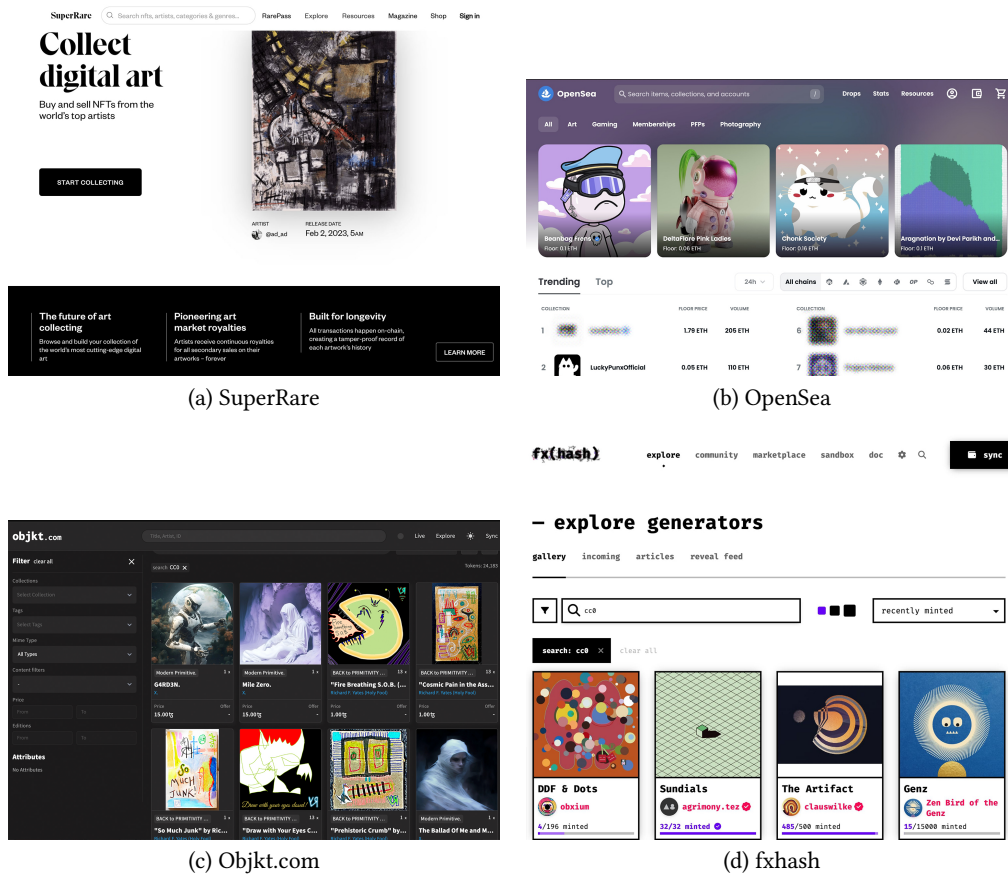
“All that Tezos is... to just be paid back to the community, essentially. I have a job, and this is more of a hobby for me, even though I get maybe more satisfaction from it than I do from my job.” (P11)

Participants in our study fit into 2 of the categories of creators recognized by Baytacs et al. [3]: digitally native artists, and artists

⁶Credits for artwork featured in Figure 1 are as follows, listed from left to right:

- (a) “After Midnight” by ad_ad
- (b) (*Top Row*) “Beanbag Frens”, “DeltaFlare Pink Ladies”, “Chonk Society”, “Aragation by Devi Parikh and Abhishek Das” (*Below*) redacted, “LuckyPunx Official”, redacted, redacted.
- (c) “G4RD3N,” and “Mile Zero.” by X;
“Fire Breathing S.O.B. (Reincarnated)”, “Cosmic Pain in the Ass”, “So Much Junk”, “Draw with Your Eyes Closed (Raw)”, and “Prehistoric Crumb” by Richard F. Yates (Holy Fool);
“The Ballad Of Me and My Brain.” by X.
- (d) DDF & Dots by obxium, Sundials by Agrimony, The Artifact by clauswilke, Genz by Zen Bird of the Genz.

All artwork used with consent from the creators and/or released with a Creative Commons 0 (Public Domain) license, or otherwise redacted.



(a) SuperRare

(b) OpenSea

(c) Objkt.com

(d) fxhash

Figure 1: Screenshots from different NFT marketplaces. (a) shows SuperRare, an exclusive Ethereum-based platform that requires selection by a committee before an artist can publish on the platform. The platform uses decentralized governance; a stakeholder can purchase a “token” to earn voting rights. (b) shows OpenSea, the largest active NFT marketplace, which is known for collectibles and “pop” art. (c) Features a search for works released with the Creative Commons 0 (CC0) license on *Objkt.com*, the largest NFT platform using the Tezos blockchain. Platforms using the Tezos cryptocurrency are considered more accessible and less risky or expensive for artists to enter, compared to Ethereum-based options. (d) Features a search for works released with the Creative Commons 0 (CC0) license on *fxhash*, a Tezos platform that specializes in supporting generative art and creative code.⁶

with roots in other media taking up NFT opportunities. We observed three interesting patterns of development: (1) digital artists finding NFT platforms ideal for supporting digitally native work, (2) artists finding unique incentive to explore or pursue digital art practices, and (3) career advancements and connections through NFT community positively influencing a “traditional” art career.

6 of our 16 participants directly described NFTs or blockchain as a “medium” for art in itself, and many discussed how it is a favorable space for animations, video games, creative code, and digitally augmented pieces.

“... works that I would not have been able to ever show before, or I haven’t been able to show before, because they were so digitally augmented, there wasn’t ever a platform to do it. I used the opportunity and minted those.” (P3)

Previous studies have mentioned the potential for physical artists to use NFTs to record provenance for physical work; some participants (P5, P14) mentioned this as an interesting possibility, but none actually utilized NFTs for physical media in this way. Rather, the physical-media artists we interviewed described ways that involvement in NFTs inspired them to start creating digitally native work, digitally augmenting their work, or creating digital pieces to correspond with physical pieces. Participant 14 described these interactions as “phygital.”

“[NFTs] opened up the world of digital art to me. Before, it was like, *I’m curious about digital painting ... but it’s not practical because how am I going to sell it? I just need to concentrate on oil painting.* But then with NFTs, I can sell my digital art... that’s when

I started digitally painting and using that work as entities.” (P14)

10 of our 16 participants mentioned participating in *collaborations* with other members of the NFT community. Another participant (P9) said that, although they preferred to produce work independently, they considered their conversations with others in the community collaborative and creatively impactful.

“I’ve worked with people who I never would have ever imagined working with. And I’ve learned whole new technologies in the process. . . . So it’s just been a lot of fun, the doors that it’s opened.” (P8)

“I basically never collaborated with my artwork before NFTs, but now I’m collaborating constantly. And it’s a lot of fun. It’s creatively stimulating.” (P14)

Participants utilize the affordances of decentralized marketplaces, including *smart contracts*, to develop practices of courtesy, respect, and financial compensation for collaborators and muses. 6 of our 16 participants mentioned using smart contracts to split profits amongst various actors who contributed to a piece’s production.

“The collaboration tools have made it really easy for people to share revenue and share royalties and do collaborations together. . . . You don’t even have to worry about it; it all just happens automatically. It makes it so simple.” (P11)

“I’ve seen someone’s art style, and I’ve reached out to them to be like, ‘Hey, can I make a tribute piece and give you 15%?’ because you can just automatically do that kind of thing. And it feels really good when I get to explore and also continue to spread that wealth in the process.” (P8)

5.2.2 Artist-directed distribution.

“All these social media corporations, I can see documented on their site I have over billions of views and I don’t even get a dime. They make it hard to make a living. . . . For years, there have been different tactics [for] not paying artists, or just giving people clout or credit. So, the NFT thing, to me, it’s a no brainer.” (P4)

In many traditional Art Worlds, distribution is offloaded by creators onto actors dedicated to distribution tasks, such as gallery curators and publishers. In Figure 2 we compare NFT platforms with other avenues for distribution of creative artifacts.

As sites for online creative publication and interaction, NFT platforms allow artists to control their distribution and reach global audiences, while replicating patterns of valuation seen in traditional fine art worlds. NFT platforms support a disintermediated distribution network by giving artists the tools to independently complete the distribution tasks required to participate in the Art World and interface with collectors directly. This means that a bulk of distribution tasks and practices, albeit technologically supported, are a part of the NFT artist’s workload. In exchange, artists have more power over how their work is distributed and a more direct connection to their collectors.

“Usually a gallery acts as an interface between you and the collectors, you’re very rarely in direct contact with your collectors. And that’s the role of the

gallery. . . they deal with a lot of crap. . . . They also establish certain sales strategies, strategies of desires and attractivity towards your work, that typically artists aren’t really good at and aren’t really trying to do. . . . In NFTs you don’t have any of that. You kind of do it all yourself.” (P16)

Participant 14, as an oil painter with extensive experience working with galleries to distribute their work, described creatively experimenting with distributing their documentation of physical paintings as NFTs:

“I always document my paintings. . . for all my past sold paintings, I just started minting those. . . I would cycle between 1-of-1s and editions⁷ and that was just experimenting with how the market would respond. You know, like, what did people like? Do they like 1-of-1s? Do they like editions? And how much?” (P14)

Compared to traditional gallery systems, NFT distribution carries the advantages of global reach and fast-paced interactions, allowing artists to accelerate the international growth of their career and audience.

“After I minted my first work, things changed really, really fast, because the space of web3 is really fast paced. . . . my status as an artist also changed really, really fast. . . all in all, it has been life-changing in a very good way.” (P16)

Physical artists using NFTs to supplement a more traditional art career described the positive impact of the fast-paced, interconnected NFT support network on their success and overall capacity to distribute work.

“Last year I did a show in Memphis, Dallas, Denver, Los Angeles, Oakland. . . I rented out the spaces, I did everything for those shows, and all of it was paid from what I was making from NFTs. That’s a huge difference in terms of how I get my physical art in front of people.” (P2)

“[NFTs] allowed me to connect with so many people, both from traditional art space and the digital space. . . this was the direct reason that allowed me to pursue the artistic practice to a more serious extent. . . it was really those relationships that were made possible within those digital realms.” (P15)

NFT platforms are comparable to other social media platforms - they provide an open, artist-directed participatory digital environment for publication that facilitates community interaction and collaboration. Creators of digitally native work or work particularly suited for digital presentation (animations, creative code, video games as art, high-resolution or digitally interactive pieces, etc.) value having a digital publication environment; physical exhibitions may detach such works from their ideal context.

“I’ve experimented . . . with showing physical works. Which is, of course, not always feasible, given that my

⁷1-of-1s refers to selling an NFT as a unique piece, that only exists as a single copy. Editions refers to selling a multiple NFTs with the same content; this is comparable to selling a series of prints.

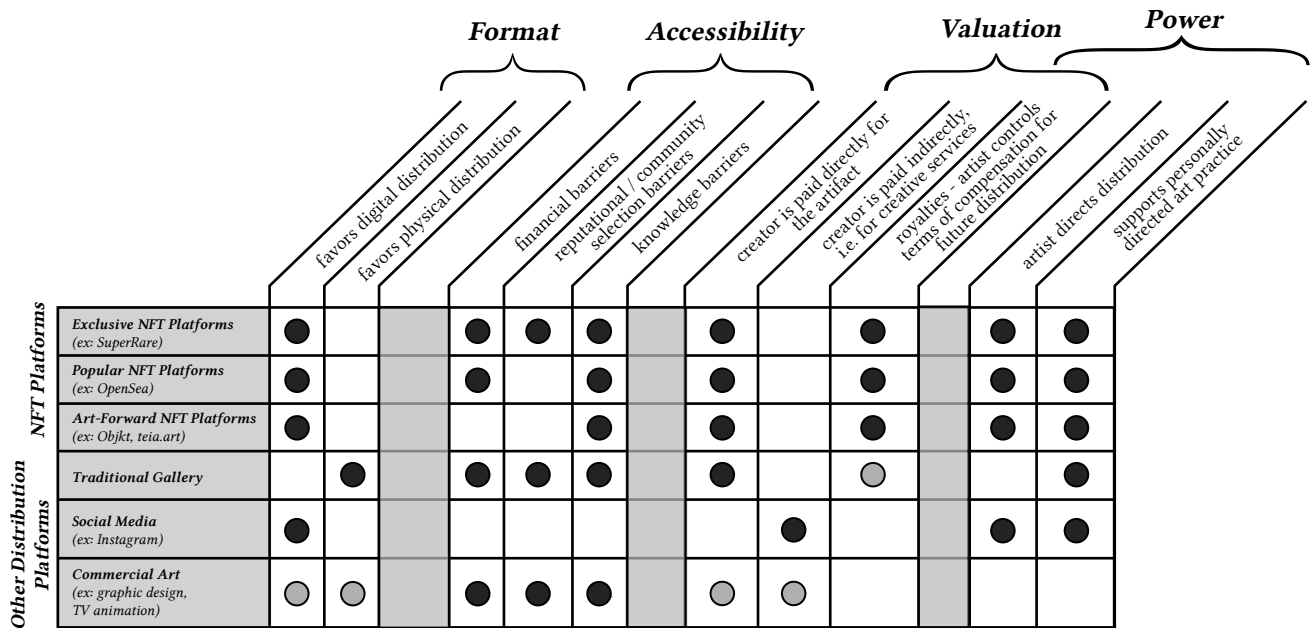


Figure 2: Comparison of different avenues for distribution. The lighter mark for Traditional Gallery under “royalties” indicates that royalties on secondary sales can be negotiated into a contract with a traditional gallery, but this is not common or standardized. Our participants with experience in the gallery world (P13, P14, P6) cited giving 50-60% of their primary sales to a gallery distributor, and receiving no profits on secondary sales in a traditional market. The lighter marks for Commercial Art are to accommodate the variety of possibilities for format and compensation depending on the creative service.

primary medium is animation. ...I really don't like seeing works shown on TV screens.” (P15)

“...I think by far [NFTs are] the best medium to distribute my art, because my arts are digitally native; it's not a physical thing, it begins with and ends in a digital environment.” (P7)

However, NFTs platforms and communities meaningfully diverge from social media and other digital distribution platform in part by embedding a representation of value for each digital piece.

“My main domain is digital... and that's why my only options were tossing my digital works on social media and getting likes. I can't afford anything with likes, you know... I can't buy bread with likes.” (P10)

“Digital art on the Internet was always seen as a service... maybe you want to get a job as freelance, or you want to build an online portfolio, maybe you wanted to sell your painting through social media... it's not a medium in itself... I feel like NFTs kind of gave [digital art] value... without having a service or a need attached to it.” (P9)

5.2.3 Evaluation in NFT Collection: Democratizing or Dehumanizing. In traditional art worlds, the value of an artifact, and the system by which it is evaluated, is determined by a selective group of actors. An actor may gain access to this exclusive group by widely earning the respect of their peers, by formally training in art critique

and becoming an art critic, or by having wealth and using it to patronize the art world in exchange for reputation. The NFT Art World creates platforms for replicating these patterns, while also providing the infrastructure to broadly improve access to collection and evaluation for its participants.

Confusion and opposition regarding the concept of buying and selling NFTs often arises from the perception that “ownership” of an NFT is functionally meaningless. Purchasing an NFT does not necessarily transfer any licensing rights – In fact, many creators choose to release NFTs under the Creative Commons 0 License, including at least three of our participants (P13, P8, P11). Nor does the system prevent any individual from downloading or taking a screenshot of the asset.

To then answer, *Why do NFT collectors collect NFTs?* – we identify in Table 1 different ways users utilize collection and gallery curation features of NFT platforms and the motivations behind how and why participants do so, or perceive their community doing so.

We consider the many motivations behind why and how users utilize collection on NFT platforms within the categories of intra-actions, inter-actions, and outer-actions. We use intra-action to describe actions that are primarily motivated by the prospect of personal benefit. In contrast, collection with the goal of *inter-action* describes communication between two or more actors in the network, and *outer-action* describes ways actors present to others and exchange information between themselves and their network [31, 49]. Actors may utilize the same structural affordance of NFT platforms

Collection as Intra-Action

Collecting for sentimental value	"That's the cool thing about this space is that, in many ways people are buying art just because they like it." (P5)
Collecting for speculative gain	"The person who's going to buy your art is either someone who really loves the art, or someone who wants to flip it in 10 years, and they're betting on you being a bigger artist so that they could." (P1) "There are plenty of people who will perceive the digital art that has been tokenized as just a token, right? ...And will collect it betting... that it will appreciate in value the same way cryptocurrency does." (P5)
Collecting to act on personal taste	"Collecting is also like, really personal. Personal thing, right? You collect things that speak to you and that might not speak to someone else." (P9)

Collection as Inter-Action

Collecting to support the artist's career	"When I seek out pieces, and I want to support other artists... I'm supporting people who might not have seen much success or are similar to my size... it only makes sense that since I'm generating revenue at all from doing this, that I share it with the people who helped me get here. (P8)
Collecting to support the ecosystem	"I became a collector, because when I sold something, I think I had to buy from other artists to support this ecosystem. ... They were buying from me, I was buying from them, so it was like a mutual process for us." (P10) "I find it important to give back a certain percentage into the ecosystem because I believe in the community. ...let's say I have an edition of 20 and it sells out, then I want to go and buy three works of some other people. (P12)
Collecting to build relationships	"Most of the artwork I purchase, though, I get it from friends who are having the same kind of fun that I am." (P13) "I've met a lot of great artists, a lot of really inspiring people, started doing a lot of different collaborations. And that social aspect has been really, really important" (P16)

Collection as Outer-Action

Collecting for community reputation	"It's so much easier to make these genuine connections because everyone has a verified identity. It can be an anonymous identity, but if it's verified on chain ... it's public, you can go to their Tezos address and see. ... once [artists] blow up, they look at what they spend the money on. ... there's some artists who invest a lot back into the community, and they'll donate a lot to causes that matter to them, and you can see that it's all verified on chain." (P11)
Collecting to showcase artistic taste	"I don't have any formal training... This is just my personal gallery based on what I find interesting, ... There are people with that background who have become very important critics in the scene simply because they get recognized for their taste, ... like, they really do have a good eye and their track record shows it." (P11)
Collecting for luxury	"At the highest level, in the traditional art space, people collect names, as opposed to collect art. And that's the same here... the biggest collectors are collecting names, and they're kind of hyping each other, so that they all want to collect the same names." (P5)

Table 1: Comparing different uses of the collection and gallery curation features on NFT platforms, to outline the motivations behind how and why participants subjectively use these features or perceive their community using them.

(e.g. purchasing an artwork) with multiple, overlapping motivations driving their action.

Collectors were not the focus of this study; our participants were all artists and NFT *creators*. However, many of our participants are artist-collectors who described collection becoming an important part of their creative process and development as an artist; some mentioned enthusiastically collecting thousands of NFTs. The artist-collectors in our participant pool emphasized that collecting for financial speculation was not their primary motivator:

“I love to collect, but I don’t collect it really as an investment.” (P11)

“...I have art from artists all over the place, and none of that is with any expectation that any of it will go up in value, and if it ever does, I have no idea how I would even sell it. That’s not its purpose. The purpose, one is, *‘it’s pretty, and I like it.’*” (P1)

Artist-collectors who were not personally motivated to collect participated in collection as inter-action and outer-action: to facilitate relationships with other artists or to support their community, for instance. Participants also use collection features to develop a working understanding their own collector base. They were aware that some collectors purchase artwork primarily to resell it for speculative gain. However, participants (especially those with traditional art world experience) recognized a unique feature of speculation in the NFT Art World: creators can use smart contracts to set the royalties they will earn on secondary sales for perpetuity. As a result, they benefit from speculation on their NFTs:

“One of the best parts of NFT and crypto-art culture is that if it sells multiple times, the artist gets a little chunk of it each time. It always seemed weird to me that Andy Warhol can sell something for \$300, it can go into an auction... it sells later for a million, and the Andy Warhol estate doesn’t get any of that.” (P13)

“One collector who listed [my work] is another artist, and he listed it for like, 10 times my floor price... I think he’s just trying to help me out... I set my secondary market price at 25%, which I love... if you resell it, I get one fourth forever.” (P3)

Some participants described feeling disappointed when they noticed collectors purchasing their art for financial gain, especially those they perceived as “bots.”

“I’m working on ways to make sure that the people that are collecting my work are gonna value it for the art’s sake, or not just gonna flip it, right? ... they’ll buy something, and then they’ll immediately try to sell it within 48 hours and get a return, and then if they can’t get a return... all of a sudden they’re selling it for less than they bought, and that’s just kind of disrespectful.” (P5)

“It can be dehumanizing, like it’s just a bunch of bots... I know for a fact that a lot of them are real collectors... but there are times where I see some pieces just get absolutely bottled.” (P8)

Still, the act of “collection” is considered a significantly more meaningful and supportive interaction than a “like” on social media:

“On a [social media] platform we can only serve likes, push the button of love and likes and share. But with NFT, if you like the artwork of your friends, or some underground artist, you can buy it. It steps up the game of artwork sharing.” (P7)

“When [a piece] goes viral on social media, you get all these empty compliments... when you get a piece that actually goes viral in terms of sales, that represents hundreds of people who actually are like, *‘I really like this, I want to have it in my collection’*” (P11)

Several participants described noticing specific collectors who consistently purchased many pieces over time. Increased visibility and success for an artist’s career can raise the value of that artist’s pieces, including those previously purchased by a collector. Thus, the system incorporates real financial incentives for collectors to continue promoting an artist after purchasing their work, which can translate into long-term career support.

“There’s various patrons who support my art a lot more than other people... they’ll collect everything that I put out, and that’s really gratifying. It’s very motivating to have that opportunity.” (P11)

“I’ve gained a lot of loyal collectors of my work, some of my other friends have other loyal collectors, and those people become your friends over time, because there’s a kind of relationship that gets built and fostered.” (P12)

Some collectors acquire works to act on their creative taste – to develop their “eye” for art and showcase that taste to the community. Participants identified this democratization of collection as a unique feature that undermines patterns of exclusivity in the evaluation systems of traditional art worlds:

“It democratizes the art of collecting, of curation, very much away from the traditional gallery scene or the traditional publishing scene where it’s only people who have this sort of... formal training and this eye for art that are allowed to say what’s interesting... [NFT collection] gives that power to anyone who likes anything or finds anything interesting.” (P11)

Artists mentioned noticing their collectors’ curation skill and artistic tastes developing over time, and expressed hope that the space will continue to mature.

“The collectors are branching out and it’s evolving naturally... you’re seeing more more a well-rounded, aesthetic rather than just this, flashy, completely digitized look.” (P3)

“It’s an immature market, it’s just been around for two years and traditional markets have been around for like, 200 years... Most people in NFTs have a crypto background rather than an art background... in time, they’ll have more mature conversations about what constitutes as good art. It needs that maturation period... collectors are trying to find themselves.” (P9)

Participants recognized that using collection to showcase wealth is a motivation for collectors on NFT platforms that replicates patterns of “luxury” familiar to the traditional gallery world. That

said, utilizing gallery collection outer-actively, such as to showcase your record of activities on the platform, is valuable in a space wary of bad actors. While a well curated collection of NFTs might signify artistic taste or wealth, it can also signal active, thoughtful support of a community. Some artists utilize the affordances of public ledger-tracking to “vet” their collector base – two participants described using prior collection activity to decide which supporters would be trusted members of their inner circle, who then receive special communication and interactions with the artist.

“I have a little private group... I don’t let anyone in, because I want it to be a safe space. ... you don’t want people who are just going to flip your work and undervalue it, too. So people who really are believing in me as an artist in the long term, and they want to see how I evolve and grow, I let them into the group, and then they get perks and special deals.” (P12)

“... my old collectors, because I know that they like my works, that they’re not really interested in short-term investment... I list [NFTs] and then I make them for my reservation priority list. ... that’s kind of a strategy to select my collectors.” (P7)

5.3 Grappling with “The Technology”

“... It’s very cool to be a part of this little digital renaissance. ... art is a catalyst, but not the main intention of what is going on.” (P2)

The blockchain-based technologies underpinning NFTs contribute to a perception of data ownership and permanence,⁸ and to certain features of digital convenience. These aspects positively influence participants’ choice to use NFT platforms.

“I have boxes and boxes of drawings, and I can show them to people when they come to the house, but this allows the artwork that I make to be seen all over the world for almost no money. And it’s not permanent, but... as long as the blockchain is continuing, then the record of everything that I’ve made is kept solid. And I love that.” (P13)

The Hic et Nunc community’s ability to migrate to new platforms, without losing their data or network connections, made an impact on many of our participants, especially those who “witnessed” this event - it is considered the “perfect use case to show why decentralized technology can be useful.” (P15)

That said, although the NFT space as it exists today was facilitated and accelerated as a consumer application of cryptocurrency and blockchain technology for collectibles – the actual *utility for artists* provided by these particularities of system design could be considered something of a peripheral incident, and one that carries with it certain challenges. Participants seemed hopeful that the space might develop to allow new users to access the space and purchase work without involving “cryptocurrency” at all.

⁸Actually storing work on the blockchain can be expensive or infeasible, especially for larger pieces of data. Approximately 10% of NFTs are actually *on-chain* - that is, recorded in the blockchain data structure itself- 40% of NFTs are hosted on private servers, and the URL is published on the blockchain, at the risk of becoming a broken link.) The remaining 50% of NFTs are hosted on IPFS [30]. The IPFS (InterPlanetary File System) is a decentralized, blockchain based data storage network that aligns with the values of data-conscious actors in the NFT space [66].

“I wish NFT collecting were just like... people buy the album of their favorite musician, or subscribing to Spotify... it’s just enjoying the culture, it’s just collecting your favorite artists. ... Rather than you know, trading in an order. ... there are some obstacles here in NFT, people need to learn about crypto.” (P7)
 “fxhash just announced that they are now accepting credit card. ... that could be very nice for getting people initially onboarded. ... Once you’re past the layer of friction that is, *how people think of it*, the next layer of friction is, *how do you use the technology?*” (P8)

Many of our participants were well-suited to overcome this “friction” via prior technical experience or the mentorship of more experienced peers. 7 of our 16 participants had some kind of technical background or experience with cryptocurrency that made entry into the NFT space more accessible; 9 participants described being onboarded or mentored by actors who were already knowledgeable about the space. 7 participants cited the importance of doing extensive “research” on the NFT space before getting involved, often with the help of others in the community; P2 described spending over two months researching before getting involved.

“There’s definitely a learning curve, if you’re not in that world already. Anyone who is already into crypto, and there’s definitely some people were like, into early NFTs... Those people definitely had a head start with it all.” (P12)

The importance of mentorship might imply inclusivity issues: actors without access to onboarding resources from already experienced members of the “in-group” may face significant barriers to entry.

“Thinking it’s like, a very *technical* thing, is like a barrier, a deterrent to a lot of artists. The people that I’ve talked to that have gotten into it... are either people who didn’t feel intimidated by *the technology*, or had people who are willing to mentor them.” (P12)

This points to NFT communities’ tendency to exclude, regardless of a platform’s intentions or efforts towards accessibility. Our participant group was predominantly male (13 out of 16), featuring 2 women and only 1 non-binary participant; this participant was candid about the downsides to participation in this space.

“I don’t want to give off the impression that it’s like a utopia, or that a lot of the systemic problems that we have... don’t follow us into this realm. ... the 20 highest earners, for the most part- people can be anonymous, but... it’s still all looking like cis men... Another thing that doesn’t get talked about enough, it’s a very new space... there are like, mental health risks with doing this as a job, and there are many people who have burned out and had to leave the space.” (P12)

Their testimony may provide some insight into the users that NFT platforms have failed to effectively support.

6 DISCUSSION

In this section we consider our participants' experiences on NFT platforms as presented in *Findings* and discuss how NFT platform features facilitate satisfying interactions that support their continued participation in the NFT Art World. We condense our findings on the experiences of artists on NFT platforms towards guiding the design of future creative community sites, content distribution platforms, and interventions into the creative industry.

As evidenced by our participants' backgrounds in Table 4, many had experience cooperating in other art world systems, each with their own distinct infrastructure for supporting art creation, distribution, and evaluation: social media, graphic design, and the traditional gallery system, to name a few.⁹ We use our Findings to discuss how the NFT Art World compares to other art worlds, considering how NFT platforms might replicate, amplify, or undermine patterns of existing art production systems.

6.1 Generalizing for Designing Future Creativity Supportive Platforms

Table 2 highlights notable subjective features of NFT platforms that participants identified as meaningful to their participation on NFT platforms, and then relates these to objective features of NFT platform design, comparing them to existing options in other art worlds and noting potential drawbacks.

This analysis lends from the notion of structural and functional affordances presented in [48]. These features are relevant to our participants' choices to invest time and effort into the NFT ecosystem, in addition to, or in place of other art worlds. In the following subsections, we discuss further how NFT platforms relate to other art worlds along several dimensions, to emphasize how the NFT space is positioned to create both unique opportunities and obstacles.

6.2 A Digital "Fine Art" World

"Before, I was a designer, so I was working with clients... They gave me a brief, then I make a presentation, and I was trying to convince the clients. ... But now, I'm free, no one tells me anything about my style." (P10)

Figure 3 shows NFT platforms in relation to other avenues for supporting a creative practice or career. We draw a distinction between "fine art", which describes internally motivated, personally directed art-making, and "design" – which we use to refer to creative services directed by external powers, such as a commissioner, an art director, or a client.[26] This distinction could also be described as "high art" versus "low art" or "fine art" versus "pop art."

Physical and digital fine artists without access to the gallery world or other exclusive modes of distribution may turn to more accessible methods to distribute their work; social media appears near the bottom left of figure 3 because, although it is an accessible mode of distribution, it primarily supports creatives through ad revenue, if at all. Since alternative methods may not support a

fulltime fine art career, creatives may then turn to more monetizable creative service opportunities.

As participatory digital publication and interaction sites, NFT platforms support digital creation and distribution in a manner comparable to social media platforms and other online creative communities. Online digital publication environments are particularly meaningful for creators of digitally native, digitally augmented, interactive, and animated works.

Unlike existing social media platforms, NFT platforms enable a system of value for digital works by supporting collection, monetization, preserving provenance, and artist-governance over distribution, including the ability to set royalties. In a manner that takes after traditional fine art worlds, NFT platforms can culturally elevate an artifact's value. Together these qualities create a particularly unique intersection of opportunities for digital fine artists and digital-format works. The NFT ecosystem and artist support network can also facilitate opportunities for artists to enter previously inaccessible cultural spaces. "Elite" NFT subcommunities like SuperRare have successfully extended the culture of "high art" communities, drawing the participation of some traditional fine art collectors, auction houses and galleries including Sotheby's and Christie's. This has created new paths for artists to assimilate into exclusive fine art spaces. This intersection of affordances positions NFT platforms (outlined in black in 3) to provide a particularly unique set of opportunities for personally-directed *digital fine art practice and exploration*.

This is also meaningful for digital fine art *collection*. Actors do not require formal training to start collecting NFTs, and the public visibility of their collections can lead to recognition as a critic or curator. These platforms facilitate disintermediated interactions between collectors and creators, and provides direct, perpetuating incentives for preserving those relationships and the wellbeing of the ecosystem moving forward.

6.3 A High Barrier to Entry

With "invite-only" restrictions to distribution, the involvement of "blue-chip" stakeholders, including auction houses and major corporations, and their cultural influence on the NFT community at large – selective NFT platforms can effectively mimic, and perhaps *exceed*, the inaccessibility of the most exclusive traditional art world communities. Financial barriers to entry, including costly transactional fees, technical knowledge barriers, and the advantages afforded to already particularly privileged members of the art, technology, and finance communities further amplify the exclusivity of some NFT platforms. More accessible NFT platforms employ currencies that are significantly less costly to trade with. This creates spaces that require less financial risk to enter, attracting users who value democratization and accessibility. This multiplicity in platform design and the way that the corresponding site cultures attract and support a wide, stratified spectrum of actors is not necessarily unique to NFTs, but rather appears to replicate a pattern identified throughout the history of art worlds: *social stratification and identity construction* being a major component of art's function in society [6].

However, even the most accessible of NFT platforms still feature significant barriers to entry. We identified how technical experience and access to mentoring impacted participants' ability to enter and

⁹Several participants mentioned prior career experience in art education, which we consider a creative service, but leave out of this discussion due to its somewhat removed motivations (activities with the primary goal of educating students, rather than art-making).

Subjective (User-Experienced) Features of NFT Platforms	Relevant Objective Features of NFT Platform Design	Comparison to Existing Options	Potential Trade-Offs
Access to a global community of potential supporters and collaborators	Digital publication features, social networking features (e.g. user profiles, content feed)	Afforded by social media and other online creative community platforms	Open to interaction from bad-actors and harassment, necessitating regulation
Artist-directed, disintermediated, fast-paced global digital distribution	Digital publication features	Afforded by social media and other online creative community platforms	Bulk of “distribution activities” become part of the artist’s labor
Support for digital fine art / personally-directed digital artifact creation	Digital publication features, monetization	Supported by some (often exclusive) galleries or publishers, indirectly supported by social media (e.g. ad revenue)	Attaching a variable financial value to the piece can distract from its artistic value, commodifying it
Preservation of provenance and transaction history	Decentralized ledger tracking	Possibly a unique affordance of decentralized technology; strived for in other art worlds via record-keeping, metadata	Privacy concerns
Ability to showcase activities to the network and “vet” the activities of other actors	Decentralized ledger tracking, collection features, social networking features	Afforded to a lesser degree by social media and other online creative community platforms	Privacy concerns, could lead to exclusive “in-groups”
Data “permanence” (for artifacts, network connections, and transaction histories)	Decentralized data storage (e.g. using IPFS), decentralized ledger tracking	Possibly a unique affordance of decentralized technology	Privacy concerns, user’s history could be leveraged against them
Governance over artifact distribution, including the ability to earn royalties in perpetuity	Smart contracts, decentralized ledger tracking, monetization features, cryptocurrency payment support	Although less common and often outside of the artist’s control, artists can sometimes secure royalties via traditional contracts in other art worlds.	Attracts “money-driven” individuals and speculators to the space, associates the space with volatility and risk

Table 2: Here we draw connections between notable subjective (user-experienced) features of NFT platforms, the objective features of NFT platform design that are supportive of or relevant to those user experiences, a comparison to how other existing options that might support this feature (or the unique value of NFT platforms’ implementation of this feature), and finally a column for noting potential drawbacks or tradeoffs.

thrive in the space. We acknowledge that our participant pool demographics, featuring an over-representation of male, cisgender users and those with technical experience, do not seem to contradict mainstream perceptions of the NFT space as dominated by, in the words of P7, “crypto bros.” We explain further in Limitations how we may have failed to recruit a comprehensive sample of the NFT community, and how we almost certainly failed to represent the voices of those who were unable to thrive in this space or otherwise excluded by the community; the testimony of our 1 non-binary participant lends to this.

The participation of speculative investors and decentralized finance enthusiasts has been fundamental to the space’s development and inextricable from its culture as it exists today. We described how participants find the affordances for monetization and royalties meaningful, supportive, or even life-changing. That said, specifically using *cryptocurrency* to facilitate that monetization carries implications that are potentially detrimental to the usability of NFT platforms. Successful online creative communities require committed users, regulation of behavior, and procedures for attracting and socializing new members [36] and retaining them by creating feelings of belonging[38] – it is clear that, for the NFT space to sustainably thrive as an artist supportive ecosystem, it must continue

to creatively mature and find ways to attract, onboard, and support good-faith actors – the involvement of technologies that are often perceived as intimidating or risky could introduce challenges similar to those identified in studies by Froehlich et al. on novice cryptocurrency users [22, 24].

Although reports of the NFT ecosystem have overwhelmingly focused on its status as a site for “crypto-speculation” or as a showcase for decentralized-technologies, our participants overwhelmingly centered “the art” - not the collectibles, the money, or the technology of the NFT space - they discussed the ways that NFT platforms support their creative activities as integral to their continued participation. While NFT platforms that make further improvements to usability may emerge in spite of these challenges, designers of all future participatory web platforms and online collaborative communities might consider the implications of incorporating similar mechanisms of support for their target users, as highlighted in Table 2. For example, platform designers looking to support a sense of archival “permanence” might consider decentralized data storage options, and those looking to create a sense of creative agency could consider providing mechanisms that support artist-governance in the distribution of their artifacts.

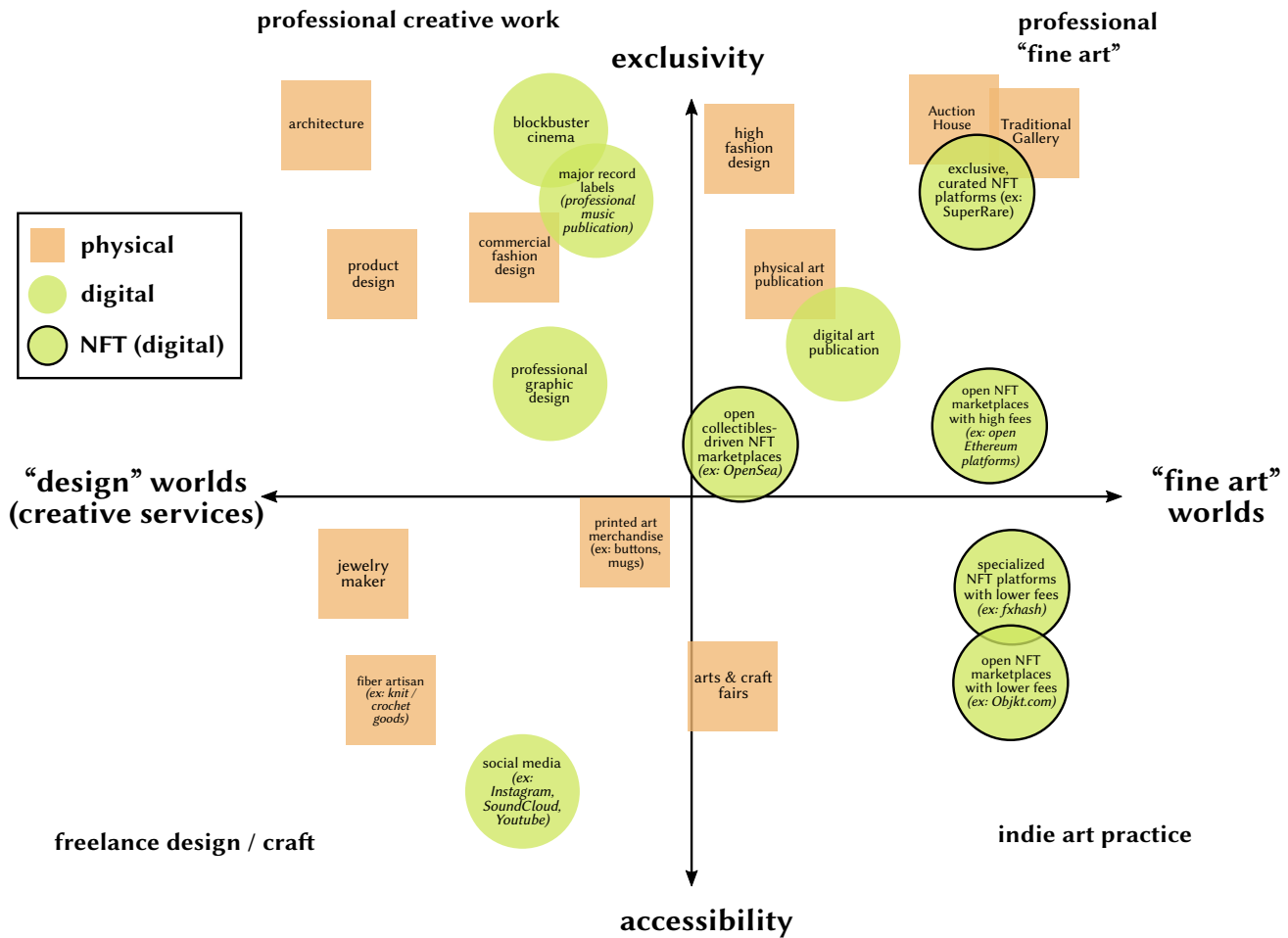


Figure 3: This figure compares different digital and physical platforms for creative careers along the axes of exclusivity and accessibility, versus “design” worlds (creativity as a service) and “fine art” worlds (personally directed art practice). NFT platforms mimic the openness of social media platforms, while also providing a system of value and respect for artists and their artifacts themselves, not unlike the value system of traditional fine art worlds. Together these qualities create a particularly unique intersection of opportunities for digital fine art creators and personally-directed digital artifacts.

7 LIMITATIONS

A sample size of 16 participants does not represent a comprehensive sample of NFT user population. Although our snowball recruitment method, where participants help with further recruitment, improved response rate from individuals otherwise wary of community outsiders, it is difficult to achieve a comprehensive sample with this method, and we risk excluding participants who are already excluded by the community and are therefore disadvantaged. It is likely our study represents a clustered sample, rather than the diversity of perspectives across the NFT ecosystem.

8 CONCLUSION

This paper presented an analysis of interviews with 16 participants in an emerging NFT Art World. We identified how different NFT platforms and their affordances yielded culturally distinct practices and sub-communities. We then analyzed how those platform affordances supported creation, distribution, and evaluation of art works in novel ways. We characterized the uniquely motivated intra-actions, inter-actions and outer-actions supported by collection on NFT platforms.

The NFT Art World described by our participants opened new avenues for artists to financially support themselves in the pursuit of digital fine art practice and exploration, while also replicating the

knowledge and resource barriers of traditional art worlds. Although more sustainable options exist in the space, the NFT marketplace at large is dominated by the use of costly and inaccessible technologies and may amplify advantages for already privileged individuals. Many of the subjective, perceived features of the NFT Art World described by our interviewees are not necessarily tied to the current technology stack. The tie to cryptocurrencies in particular was perceived as a complicating or problematic drawback to some of our participants and might impede the growth and maturation of the ecosystem into a network of healthy and sustainable online creative communities.

We hope our analysis can guide the designers of future interactive systems that seek to support artists and art communities. Such systems can design for the features of NFT platforms that help give rise to the useful patterns of interaction described without necessarily following the implementation choices of current NFT platforms.

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A APPENDIX

A.1 Energy Consumption Data

	Estimated Annual Energy Consumption (MWh in thousands)	Estimated Annual Number of Transactions	Annual Energy Consumption / Annual Number of Transactions (kWh)
Bitcoin [17, 40]	130,000	93.1 Million	1,396.35
Ethereum PoW (Pre-September 2022) [17, 33]	53,000	400-413.2 Million	128.27
Ethereum PoS (Post-September 2022) [17, 33]	2.6	400-413.2 Million	0.00629
Tezos [2, 51, 61]	0.113	15.7 Million	0.00720
PayPal [56]	260	22.3 Billion	0.01166
Visa [62, 63]	196.1	192.5 Billion	0.00102
Total Reported by Mastercard, Amex, and Visa Combined [18, 45, 55, 62, 63]	500	310 Billion	0.00161

Table 3: Comparing estimated annual energy consumption and number of transactions, as a measure of network size, across different decentralized (cryptocurrency) and centralized finance networks. Bitcoin annual energy usage is estimated as low as 60 TWh/yr and as high as 230 TWh/yr; we use the 130 TWh/yr, or 130,000 thousands of MWh, estimate from [15, 17]. Mastercard reported 107,320 MWh, Amex 70,568MWh, and Visa 196,111 MWh, for a combined total of 374,000 MWh in 2020. We follow [55] in rounding up to 500,000 MWh (or 500 thousands of MWh) to show how cryptocurrencies compare to the existing centralized finance industry.

A.2 Participant Data

ID	Age	Gender Identity	Educational Background	Career Background Before NFT Involvement	Occupation at Time of Interview
P1	42	Man	MFA in Film, Animation	studied animation, creative director, contemporary artist	creative director, contemporary artist
P2	24	Man	Some higher education in Robotics	robotics technician, gallery artist	fulltime artist
P3	40	Man	Art Vocational School	visual artist, gallery and publication artist	fulltime artist
P4	42	Man	3 Masters Degrees in Creative Fields, Trade School	freelance artist, educator	fulltime artist
P5	36	Man	Bachelors in English, Creative Writing, Poetry	music career, fulltime artist since 2010, represented by galleries, traded crypto since 2015	fulltime artist
P6	25	Woman	Bachelor's and Vocational School in Graphic Design	animator, graphic designer, design, marketing	fulltime artist
P7	27	Man	Bachelors in Graphic Design, Masters in Design	graphic designer, hobby illustration, teaching, webcomics, social media distribution	artist, lecturer, graphic designer
P8	22	Man	Self taught programmer, current Game Development student	Game developer	artist, student
P9	25	Woman	Bachelors in Graphics and Communications	freelancer for video game companies, character designer, sculptor, fine artist	artist
P10	29	Man	Higher education in Communication & Literature	graphic designer, advertising, prints, some art practice	fulltime artist, digital publisher
P11	31	Man	PhD in Biophysics	engineer	engineer
P12	40	Non-Binary	MFA in Poetry	Educator for 17 years, DJ, retail	fulltime artist
P13	50	Man	BA in Humanities, English, Anthropology, Communications	Writer, DJ, Artist, active in online social communities	artist / retired
P14	41	Man	BA in Architecture, Formal Fine Art Training	traditional fine artist, oil painter, gallery artist	fulltime artist
P15	32	Woman	Masters in Mathematics, PhD in Computer Science	traditional gallery distributed photographer	fulltime artist, part-time engineer
P16	41	Man	Masters in Fine Art, New Media and Communication	digitally native fine artist, physical gallery exhibitions	fulltime artist

Table 4: Participant background information.