arts

MDPI

Article

The Shape of International Art Purchasing-The Shape of Things to Come

Benjamin Duke

Institute for Inclusivity in Higher Education, University of Leicester, Leicester LE1 7RH, UK; bd158@leicester.ac.uk

Abstract: This article is about the role of cryptocurrencies, for example, decentralized autonomous organisations (DAOs) and non-fungible tokens (NFTs), in the international art market. These are cryptocurrencies which can be used to work with local governments to deliver non-state-funded consultancy in, for example, funding bid writing or community risk assessment. Self-polycentric and cause-based DAOs typically focus on actively listening to their token owners, utilizing the group's skills under a transparent incentive structure fostering trust. This article delivers a critical evaluation of DAOs as an organisational management structure and business operations vehicle. This evaluation considers DAOs' utility in supplying goods and services, through the critical lens of facilitating the international art market. The objective of this article is to raise wider awareness and understanding of DAOs as a legal entity. This paper acts to introduce the uninitiated to the business, societal value and legal uncertainties of DAOs and NFTs. DAOs are internet-based organisations built upon a set of instructions presented in and controlled by a computer programme, i.e., a smart contract. Effectively, DAOs are an artificial, electronic, online, digital technology entity, with no physical form.

Keywords: decentralised autonomous organisations (DAOs); arts-based DAOs; non-fungible tokens (NFTs); corporate mutualisation; cryptocurrency

Citation: Duke, Benjamin. 2023. The Shape of International Art Purchasing-The Shape of Things to Come. *Arts* 12: 208. https://doi.org/10.3390/arts12050208

Academic Editors: John Zarobell and Elena Sidorova

Received: 5 June 2023
Revised: 21 August 2023
Accepted: 16 September 2023
Published: 22 September 2023

1. Introduction

This study's objective is to inform art-world stakeholders of the many potential benefits of using DAOs and/or NFTs and also of some of the pitfalls, for example, sudden devaluation of an organisation's NFT or cryptocurrency, in the future. The research aims of this paper are to analyse the effect of DAOs and NFTs on digital corporation mutualisation in the international art market and Web3 governance of art sales. There is a paucity of knowledge that explains the following: How business-for-profit DAOs who choose to collaborate in digital corporate mutualisation arrangements operate; How that differs to not-for-profit community enterprises, who choose to acquire art for the public good. The dawn of Web3 has appeared over the horizon in the international art world, reducing the role of third-party intermediaries in art acquisition. Web3 is a piece of the internet acquired or even created by art producers, which they own and control. This has created new relationships between art-world stakeholders, which raise a number of Web3 governance issues that need to be resolved.

Figure 1 provides a user-friendly precis of the main issues to consider, regarding the likely development trajectory of arts-based NFTs and DAOs in the 2020s. Although specifically labelled arts-based, the issues mentioned apply to all DAOs, NFTs and corporate mutualised DAOs going forward. Nuanced in the precis is identification of the need for a franca, which enables all art stakeholders to participate in the same space (B (@beatyandpunk) 2022, 5:45 m–7:45 m).

DAOs are a digital technological tool that can enable and oversee profit and not-for-profit business production in a more efficient manner (Glaveski 2022). There are numerous very complex aspects of DAOs which need to be considered. For example, how

an arts-based (or other type of) DAO manages; early starter and later-stage members; democratisation; changing priorities; choice of human or non-human governance; multiple jurisdictions regarding external regulations; and remaining non-hierarchal and leaderless in art collection purchases, business or philanthropic service delivery (Hackl 2021).

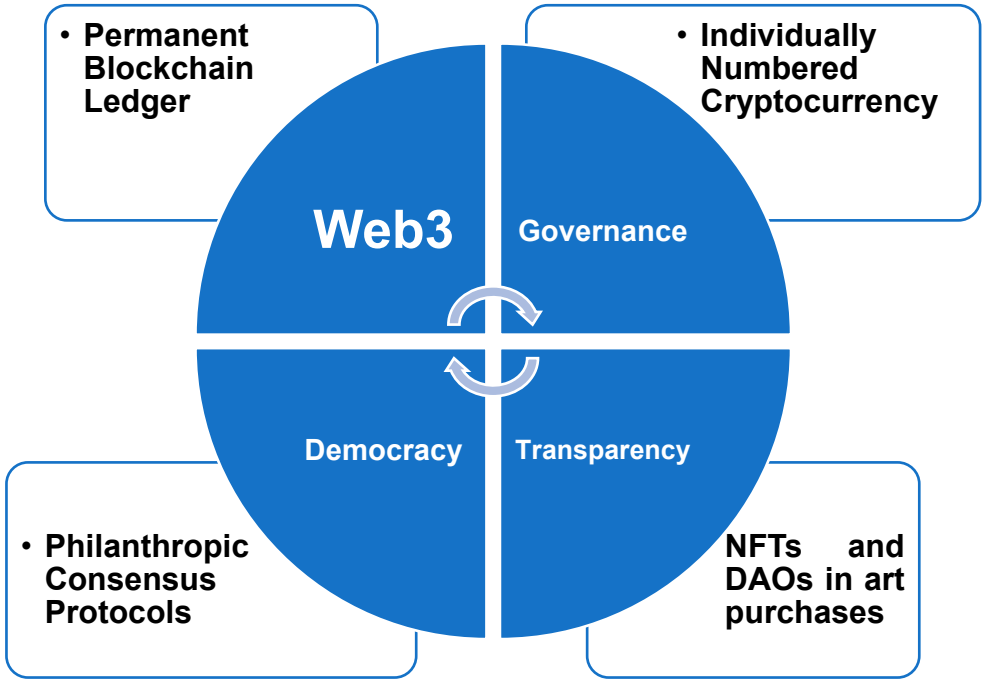

Figure 1. Arts-Based NFTs and DAOs Consortiums.

In the context of this paper, the following definitions of DAOs and NFTs provide a backdrop to the various concepts discussed as the paper develops. DAOs are run by a group of people and/or a computer program. NFTs are digital assets that are unique to the property they are associated with; they cannot be replaced by another different NFT. Both DAOs and NFTs come into being by the production of a smart contract. These are two types of digital technology which can be linked, as NFTs can be used to confirm ownership of property in a DAO. As a consequence of the proliferation in DAOs and NFTs in the 2020s, a wide range of new art-world stakeholders have been created, an art-world community of new hierarchies with different metrics of success. Artists have more of a say of what happens to their assets (McKenna 2023). DAOs, NFTs and blockchain technology have heralded a period of disintermediation (Denny 2023). The pre-technological era relationships between artist, arthouse and buyer, have been fundamentally changed by the arrival of DAOs and NFTs (Ambolis 2023). Issues of ownership, provenance and artist payment can all be verified by publicly accessible blockchain ledgers (see Figure 1).

NFTs and DAOs relate to each other on two main interfaces. One interface is manifest in the rise of collector DAOs. A collector DAO can be a for-profit business or not-for-profit social organisation that pools funds together to acquire and issue NFTs. This is an important concept and definition in the art purchase and collection world. Collector DAOs have a spread-the-costs utility, enabling multiple individuals to own a fragment of an expensive NFT (Binance 2022). For example, people could buy a small proportion of a NFT used to purchase a yacht. This yacht can be rented out to people throughout the year. People with a fragment of a large NFT that was used to purchase the yacht receive an annual rental income on their investment as well as the NFT valuation (see Figure 1). This same concept can be used in the purchase of expensive art, yielding business revenue for NFT holders from art exhibitions fees and art sales. This is the business model used by PleasrDAO, an art collective DAO that "*purchased the "Doge" meme for $4m in June 2021. They subsequently*

fractionalised the NFT (broke it up into many individual tokens) to allow anybody to buy a portion" (Andrew 2023).

The importance of the relation between NFTs and DAOs can be seen in their role in community and corporate governance (Park et al. 2023, p. 11). DAOs can help NFTs to create social goods, by enabling technological oversight of the activities and efficacy of community projects. The activities of community members, social-good creators and the future direction of NFTs can be monitored by the DAO's computer program. This is an important facet of a relationship between NFTs and DAOs, as this decides who owns art purchased by the NFTs, alongside decisions regarding art exhibition appearance and future re-sale (Stanescu and Velea 2023). In this sense, DAOs have efficacy and governance oversight utility. In practice, DAOs can monitor if a certain level of business has been achieved then authorise and implement payment of staff salaries and any bonuses. In community enterprises, DAO owners act as shareholders controlling the activities of what NFTs, acting here as social assets, can be used for. This DAO–NFT relationship would enable art to be purchased for cultural and humanity purposes (see Figure 1), so the art remains publicly accessible.

Web3 is a description of how the worldwide web (www) will evolve as the 2020s progress. Web3 incorporates decision-making decentralisation and digital encryption blockchain technology, alongside digital token-based organisational governance, purchasing and selling, manifest in the proliferation of NFTs (Fan et al. 2023, p. 5). Web3 is different to the Web1 phase of the www internet evolution of people, consumers and simply viewing static pages of information. Web3 is different to the Web2 phase in that people use the www to access or create digital platforms to give and receive information (Ehrlich 2023). In this sense, Web2 is interactive, not passive. The current phase of Web2 enables internet users to display their ideas so they also become content creators. The interactive utility of Web2, manifest mainly as digital platforms, makes Web2 an ideal medium to buy and sell goods. The era of Web2 has enabled art consortiums to acquire and sell digital and traditional art items successfully between people who have never met. Web3 is rapidly evolving in addition to Web2, which itself will remain constant, as the internet of things develops during the 2020s. The blockchain version of Web3 (as opposed to the semantic machine readability version of Web3) fills operational gaps in the art world (Drake 2022). Management of legal ownership of art alongside the payment of royalty to artists have become easier and more transparent (Schindler and Wilson-Milne 2023). Web3 addresses four fundamental aspects that are relevant in the international and national purchasing of art. These are: privacy, cooperation, openness and interoperability (Fan et al. 2023, p. 4). Web3 has enabled the creation and maintenance of decentralised digital platforms and delivered interoperability between mutualised platforms, alongside verifiable art ownership via digital blockchain technology. The distributed blockchain ledger (see Figure 1) utility of Web3 is of particular importance in the art world (Kaul 2023, p. 3). Businesses, community enterprises and individuals are able to use the ledger to establish the provenance of digital and/or traditional art, alongside previous owner history. Art-world confidence, efficacy and transparency are facilitated by distributed blockchain ledger availability in Web3.

2. Materials and Methods

This paper provides a conceptual theoretical review, which is compiled using the existing literature. Works in the published literature in this review were extracted from Elsevier, Google Scholar, MDPI, Sage Publications, Science Direct, Scopus and Springer, among other databases. Numerous well-informed individual and organisation blogs and webpages were included. These websites had particular issue-specific expertise and pragmatic knowledge, relevant to an analysis of DAOs and NFTs in the international art market. Suitability of a literary source was decided by its title, abstract content and any keywords made available. To search for articles likely to be relevant, a basket of keywords and phrases were used to ensure that the articles chosen fell within the category. Some of the keywords and phrases used in internet searches included: "Arts based DAOs"; "Decentralised Au-

tonomous Organisations in the art world"; "Art purchase using Non-Fungible Tokens (NFTs)"; "Corporate Mutualisation"; "Cryptocurrencies"; "Distributed blockchain ledger (DBL)"; "Multiple jurisdictions"; "Art, DAOs and NFTs"; "Web3 governance"; "business and non-profit"; "ownership"; "provenance"; and "artist recognition and royalties". The results of the research comprise the analysis detailed in the critical evaluation that unfolds and in the discussions contained in the headed sections that follow.

3. Discussion

3.1. Digital Corporate Mutualisation: How DAOs and NFTs Facilitate Business and International Art Acquisition

DAOs access conscious agency through their human members: the people who wrote the smart contract and/or own the DAO (Schillig 2023, p. 8). Most people initially become members of a DAO by buying NFTs, which are its native trading cryptocurrency. These are digital tokens which give people DAO membership, voting rights and a say in the governance of the organisation. In this sense, DAOs and NFTs don the clothing of stocks and shares in a traditional business organisation. This is particularly important for art-, charity-, crowdfunding- and philanthropic-type DAOs, where aspects of the good cause being supported could have changed overtime (Makridis and Larson 2023; Smith 2022). The rights afforded to DAO members by the NFTs they have purchased include recognition rights, which are vitally important in international art purchases (see Figure 1). How this works for DAOs and NFTs in business is by voting: DAO membership recognises that a certain standard of business production has been achieved. This results in the payment of an agreed level of remuneration. DAOs are programmed to assess contract compliance automatically, so no human is called upon who could make an arbitrary decision. In the art world, the role of the traditional Board of Trustees is being eroded. An increasing number of art gallery and museum day-to-day decisions are made by DAO smart code. Web3, which includes blockchains, DAOs and NFTs, is used by international art dealers to address business challenges, for example, governance, provenance and traceability (Ali et al. 2023, p. 7; Bron 2023; Ray 2023, p. 233; Shilina 2022, p. 14). Token-based DAO work practices are radically different to traditional organisational management, due to the 100% democratisation and public transparency ethos of DAOs. An ethos which means all NFT and DAO token members are jointly and severally liable if something is perceived to have gone wrong and an individual or organisation pursues a claim. Biais et al. (2023) articulate a number of reasons why people choose to use cryptocurrencies, identifying transactional advantages that using DAOs and NFTs attract. "*For example, such benefits can stem from the ability to send money, possibly to another country, without using the banking system and without being controlled by the government, or from the ability to use more easily smart contracts and tokenised assets*" (Biais et al. 2023, p. 974).

In pragmatic terms, NFTs are a digital currency, where each token is unique and cannot be replicated. Each NFT is assigned a unique identifier by its manufacturer when recorded on a blockchain, which enables independent verification of the NFT, its ownership and authenticity (GFS IT Solutions 2023; Mukaddam 2021). As each NFT is unique, they can be bought, sold and exchanged for goods, much the same as traditional hard currency. One of the benefits of NFTs is they can be used to transfer the ownership not only of digital assets but also of traditional art. An arts-based blockchain can be defined as a publicly accessible digital database that records the unique identifying code of every NFT manufactured by any source (Stublic et al. 2023, p. 3802). The blockchain would also deliver a public record of everything that was purchased using NFTs (see Figure 1). This utility enables a blockchain to identify at any time the ownership of, for example, business or digital assets of art, which were purchased using NFTs (GFS IT Solutions 2023). Blockchains also provide a record of the different manufacturers who have created NFTs which are now in circulation. This historical digital record of who has been active in a sector resonates in the international art market. Such record keeping can help with consensus protocol policy formation and innovative smart contract development (Gilbert 2022, p. 4). New entrants

to the art market, individuals or businesses considering digital corporate mutualisation, will value the immutable record delivered by distributed blockchain ledgers. Freeman Law (2022) informs us that blockchain technology is not a new concept.

> "Almost forty years ago, cryptographer David Chaum proposed a blockchain-like protocol in his 1982 dissertation entitled Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups. This work formed the bedrock of the current blockchain technology, but the notion of blockchain as a form of cryptography traces back to the 1970s".
>
> (Freeman Law 2022)

The blockchain is essentially an irrefutable digital ledger. It records NFT transactions and due its public transparency, records of each transaction along with the NFT's unique identifying code cannot be altered or deleted (GFS IT Solutions 2023). NFTs can be created as part of a smart contract which itself is a digital code with no physical form. Smart contracts verify ownership by accessing the NFT's unique identifiers, recorded on the blockchain. Arts-based digital smart contracts check compliance with the agreement terms, then enact the transaction by issuing new NFTs, each being uniquely numbered for verification purposes (Cornelius 2021, p. 6). In essence, a process of tokenisation has occurred to facilitate business transactions of ownership of, for example, intellectual property rights or some artwork. The publicly available blockchain enables the sale and subsequent acquisition of pieces of art, without intermediaries being involved (GFS IT Solutions 2023). One of the more common uses of NFTs is when a recording artist releases individual songs or an album. People buy NFTs to be able to access and/or download music from the artist's website on the internet. This can also be achieved with popular films and/or sporting events such as a football or boxing match. People pay a fee for an NFT to access the art entertainment content (British Phonographic Industry (BPI) 2021, p. 26). NFTs can be used to buy shares in DAOs as well as be the cryptocurrency DAOs use to pay investors, shareholders and business suppliers. This is the type of security utility that artists, business entrepreneurs and humanitarians seek, to solve ownership and payment challenges "*in the art, culture and philanthropic domains*" (Layton 2022). Chalmers et al. (2022) found three perspectives of NFTs when analysed through the critical lens of the needs of small creative industry entrepreneurs. The most relevant perspective of the three for this discussion is the material lens (Chalmers et al. 2022, p. 2). NFTs can be used to control access to art created by individual unique artists, who are then able to charge a fee. This is the security utility described by Layton (2022). The material creative artists deliver is protected in regards to distribution, exhibition, renumeration and royalty rights by the provenance recorded on the blockchain ledger. A prime example of how NFTs enable artists to earn money from their creations is when they make individual songs only accessible on the internet (Chalmers et al. 2022, p. 2). NFTs remove the need for creative artists to pay third-party intermediaries to distribute their art and then pass on artist royalty after purchase. There has been a significant sea change in the music industry since 2010: traditional record companies are finding they have fewer acts on their rosters, large and small (Alex 2023). NFTs enable small creative music-making artistic entrepreneurs to sell their music direct to listeners who pay the artist directly for their content. The security utility of NFTs also overcomes payment problems for arts-based community enterprises; people are able to see the expenditure of the not-for-profit company they support on the irrefutable blockchain ledger. Music NFTs have helped shift the ownership of music from record companies to the artists who write the songs.

DAOs can be programmed to ensure the funding criteria of a grant application have been met (Arts Council 2023).[1] People can also be kept informed by DAO-generated notifications keeping track as the bid goes forward for the purchase of art (see Figure 1). The greater level of transparency afforded by a DAO builds up additional trust and security between business consortium partners or philanthropic art groups (Ritter-Doring et al. 2023). The bulk of artists are small independent traders who are yet to establish themselves or become famous. Many such artists find they are earning at best the average wage in their

country of residence; they often rely upon national funding streams to be able to practice their art. DAOs are able to inform artists of various fundings sources and democratise funding bids due to their transparency, enabling art entrepreneurship to flourish (Layton 2022). DAOs can help alleviate jurisdictional problems related to art creation and innovation in certain countries (see footnote 1). Tennessee's proposed legislation provides an example of how DAOs enable business and art to operate in tandem (See Mateus and Sarkar 2023, p. 3; Debbie Blockchain and Ensembl 2021).[2]

> "DAOs are a vehicle which will drive idea in music, fintech and healthcare. Tennessee is winning whenever DAOs are established in our state that help transform industries", noted TN representative Jason Powell. "I proposed the DAO legislation because I believe in democratizing the ability to participate in various ventures previously not open to most people. I am hoping that more high-impact legislation will be passed as web3 initiatives evolve and transform the business landscape".
>
> (Layton 2022)

The initial intentions of art, charity, crowdfunded and philanthropic DAOs can change over time as new information emerges, changing the DAOs' priorities, remit and scope (Weinstein et al. 2022). The digitalized-tokens aspect of DAOs is useful for equality of ownership purposes. Essentially, the DAO management structure enables corporate mutualisation of company assets, which are digital tokens. This means the DAO is owned by its members, who now decide as a collective how the DAO should be run. Company members own the DAO's remit alongside any liability, such as an unforeseen change in the socioeconomic climate, resulting in non-recognition of their cryptocurrency. Chainlink (2022) notes that although DAOs are set up to operate automatically, they are not fully autonomous.

> "DAOs are made up of humans and therefore require manual actions from users to function, such as needing users to conduct votes, deploy code, and debate proposals. The use of autonomous in the term DAO stems from the idea of hardcoding specific function of the DAOs as immutable smart contracts. However, humans still need to interact (provide inputs) with the smart contracts (code) for them to execute actions (outputs)".
>
> (Chainlink 2022)

Fritsch et al. (2021) explain how distributed ledger technologies (DLTs), for example, blockchains, can enable business and/or not-for-profit organisations to work towards common goals. The DLT-based commissioning approach to global commoning, as articulated by Fritsch et al. (2021), can clearly be adapted to the art world. DLT commissioning can be used to deliver social goods, for example, arts-based DAOs, which provides a platform for emerging creative artists. DLT commissioning can enable corporate mutualisation of company assets (Mues et al. 2023). Fritsch et al. (2021) describe how the novel aspects of DLTs can deliver both the ethos of the common good and businesses for profit. "*Moreover, they share an ideological commitment to creating market-like structures that do not rely on the axiom of capitalism to maximise shareholder profits*" (Fritsch et al. 2021, p. 8). Mutualised art businesses can develop schemes to import little known cultural art, which they can market and sell in niche art markets. Arts-based DLT-commissioned businesses would implement corporate mutualisation of company assets by the complimentary purchase of different types of Global South art. This is a hybridisation of the business model of South South Art, an online community of international art-market stakeholders who specialise in Global South art (South South Art 2023). There would be no competing overlap between different mutualised businesses, importing and selling cultural artefacts and indigenous Global South art. This will protect indigenous art sourced from Global South countries, which is sold in Global North art houses, generating a profit to mutualised businesses. The original source, provenance and supply of Global South art can be tracked and verified using DLTs. Mutualised arts-based businesses can showcase the art and facilitate exposure by only enabling the purchase of Global South art by using NFTs.

Friends with Benefits (FWB) provide a pragmatic example of a cause-based DAO, being highly profitable whilst delivering mutually decided benefits for its members. FWB works just like a small local mutual aid organisation, but on a much grander scale, hence the reason for the high joining fee. For FWB, this fee is 75 $FWB tokens, or about USD 4000 (Roose 2022). DAOs owners, in this case, FWB members, have direct control over the organisation's digital assets, DAO ownership being in the form of $FWB tokens, which are used in votes that subsequently appear on the permanent blockchain ledger. The blockchain is a decentralised network of token owners, who must agree on what areas and how the DAO will conduct its business affairs. Transparency is key for the public good at for-profit self-polycentric DAOs; similarly, for not-for-profit cause-based DAOs, transparency and trust are also key (De Filippi et al. 2020, p. 2). For corporate mutualised cause-based DAOs, how members voted would be made available to the public. This is the democratisation utility of DAOs; every member is able to determine the location of every cause-based DAO's cryptocurrency token. Cause-based DAOs using individually marked tokens can be set up (see Figure 1) so that there are no hidden benefactors, private investors, shareholders or shell companies. This is not always the case with for-profit DAOs. Here, corporate-sector DAO cryptocurrencies carry an element of digital surveillance, an invasion of people's privacy utility (Huang and Mayer 2022, p. 338). Token-centric businesses have the ability to record and track their owners' movements without consent. This is clearly illegal in most jurisdictions in the Global North and represents a legal uncertainty which is under-theorised and under-researched.

3.2. Web3: A Governance Instrument with Double Utility to Oversee the Acquisition of International Art Using DAOs and NFTs

It is beneficial to recap the definitions of DAOs, NFTs and Web3 at this juncture—prior to further discussion of their current and likely future role in the international art market. DAOs (decentralised autonomous organisations) are internet-based, blockchain-monitored, collectively owned organisations. The latter element is key. There is no single authority, for example, a government in control. Instead, DAOs are created, controlled and governed by their members (Legge 2023). Due to the increasing use of DAOs in society, for example, by digital platform workers, or in GameFi, DAOs "*are having a profound impact on the revolutionary rise on Non-Fungible Tokens (NFTs)*" (Carter 2023). Many DAOs have their own NFTs, which can be used to signify ownership and voting rights and as a treasury. NFTs are exchangeable, identifiable, traceable, tradeable units that are unique, as each NFT has its own individual number (Hilsberg 2023). The traceable utility of NFTs has particular resonance, in regards to establishing the provenance of art items prior to their sale in the international art market. Web3 is a decentralised version of the worldwide web. Using Web3 would give creative artist entrepreneurs more data control of their digital art and more ownership of non-digital traditional art. This is because artists can use decentralised identification systems to sell their art and also to collect payment, without relying on a third-party intermediary (Hedera.com 2023). DAO investors and/or members would provide their own decentralised computers to effectively self-create and then own a section of Web3, accessible by authorised NFTs. Blockchain technology and the use of individually numbered NFTs (see Figure 1) would provide irrefutable evidence of art-item provenance and ownership. Trust and confidence are enhanced when DAOs make their blockchain digital ledger publicly available in Web3, transparency being an essential facet of governance. In this sense, the decentralised Web3 is better than Web2 which is accessed by centralised internet servers. Web3 has duality, able to offer transparency or privacy in business and not-for-profit operations, including international private art acquisitions and sales transactions. The Gen Z global population, people who were born between 1996 and 2010, are particularly attuned to Web3 due to its futuristic art presentations, often with social consciousness (Foucher et al. 2023, p. 10). Web3 enables artists to co-produce their art with potential buyers online; they can also show how they are aligned to the social issues their consumers care about. Gen Z and millennials are more likely to purchase art

from artists who are in tune with their social values and worldview (Foucher et al. 2023, p. 10). In this sense, there has been Web3 governance between the artist and the purchaser at the art production stage. Web3 enables co-production between an artist and a buyer who perhaps have never met before on the internet in real time.

Generically, DAOs and NFTs are permissionless, unregulated, digital, multipurpose vehicles: technological entities that anyone can engage with if they have the capital and choose to do so (Rennie 2022, p. 15; Salman 2019, p. 123). The main function of an NFT is to provide a unique verifiable digital currency that cannot be counterfeited, deleted or replicated. DAOs provide governance in the form of voting power, supported by uniquely numbered NFTs which, when used, are recorded on a blockchain ledger (Elzeweig and Trautman 2023, p. 315).[3] This is a digital dashboard accessible by all cryptocurrency holders. DAO governance can be cause-based, community-led and/or not-for-profit. They can apply a philanthropic ethical code formulated by founding partners, ensuring compliance with the DAO ethos (Saito and Rose 2023, p. 5).

Danto (1964) discusses an aspect of governance that is replicated in these contemporary times, heralding the need for DAO governance of art purchases and sales (see Figure 1). The aspect is that of art acceptance and recognition (Danto 1964, p. 573). For example, the CryptoPunk series of digital images first need to be recognised by contemporaries as being good art worthy of consideration. There then needs to be a system in place, for example, DAO governance, to decide if acquisition of CryptoPunk images should take place. It can be argued that Danto's (1964) philosophical contribution in contemporary times explains why we need DAO governance and recognition. Crane (1976) articulates two issues which have contemporary relevance in this paper: how "cultural innovations" should be recognised (Crane 1976, p. 719), which harmonises with Danto (1964, p. 572), alongside the existential threat of "gatekeepers" in the form of government agencies with overall control. The latter issue is nuanced in an early recognition by Crane (1976, p. 721), that society may need some form of decentralised governance mechanism to uphold multiple stakeholders' interests. By proxy, Crane (1976) identified the need for non-hierarchical decision-making and governance approaches in multiple disciplines including art. Becker (1982) provides further examples of issues that resonated in the pre-digital art world, which have contemporary relevance regarding governance in the 2020s. One issue Becker (1982, p. 93) raises is that of distribution in the art world. In contemporary 2020s application, DAO governance rules are enacted by smart contract implementation, enabled by technological blockchain oversight. Digital distributed ledgers and NFTs can verify which art items have been distributed, where and when. Becker (1982) resonates with Danto's (1964, p. 584) concern, as to who recognises and accepts new innovative art, alongside harmonising with Crane's (1976, p. 723) fear of bureaucratic "gatekeepers" in the art world. This is manifest in Becker's (1982, p. 107) notation "*that the government may have a monopoly over the making and distributing work*". The decentralised nature of DAO governance enables DAO members to pursue their art interests, recognising, distributing and acquiring artistic pieces on the international market. The operational activity of DAOs in both art-based businesses and not-for-profit organisations must be within rules agreed by DAO members. Giuffre (1999) elucidates that up to the end of the 20th century, artists had to be connected with a gallery in order to be able to sell their work. This underlines Crane's (1976) bureaucratic "gatekeeping" concern, alongside Becker's (1982) focus on "distribution". Technological advances have enabled DAO governance structures to break the art galleries' virtual stranglehold; people's art can be viewed on digital platforms. The 21st century internet age has enabled more people to be exposed to a whole gamut of innovative art from multiple sources for free. Creative artists are now able to design their own websites that act as art galleries, to display and sell their artwork. Artists now have direct control of who gets to own their art and immediate possession of the proceeds the buyer pays. Giuffre's (1999) contribution acts to inform us that sections of the art production market in the 1990s were a fundamentally flawed cartel: a self-serving cabal, of which only artists who were connected to certain people received an invitation to enter, regardless of the quality of their art. De Nooy's

(2002, p. 147) study discussing "artistic prestige" continues along a similar vein. As with Crane's (1976, p. 720) "Reward Systems in Art" study, De Nooy (2002, p. 159; citing Van Rees 1983, p. 404) identifies that "*artists have to pass gatekeepers who admit them to a new level of activities and esteem in an art world which consists of prestige strata*". In contemporary times, as the internet era has progressed through the 2020s, this artificial barrier has been broken down by DAO governance protocols (see Figure 1). Velthuis (2005, p. 12) articulates how the modern art market is governed by a "dealer-critic" system, which has duality incorporating Crane's (1976) "gatekeeping" and agenda-setting utility. Art dealers active in the early 21st century promoted their artists by persuading galleries and curators, profit and not-for-profit, to exhibit their work. Often, the art dealer had already purchased the artist's work, creating a vested interest to encourage curators to exhibit a particular artist's work in future shows. It is, at best, unethical if the art dealer does not disclose this relationship they have with the artist to a museum or gallery they approach. These early 21st century unedifying situations indicated by Velthuis (2005) can be addressed by DAO governance. Digital blockchain technology, when made publicly available, would disclose the name of the artist who created the art owned by the DAO membership. DAO governance can ensure that any gallery or museum approached is informed; the DAO making the offer are themselves the owner of the art.

Governance is manifest by people being able to raise issues, put forward proposals, agree to vote and publicly audit the DAO code. Members of an arts-based DAO can be thousands of miles apart (Flamingo 2023). Governance is enforced when a DAO smart contract decides if organisational activity is compliant to what has been programmed into the code. This enables international art consortiums to form a DAO, which is effectively a trading community that buys and sells art. Trading via the DAO is subject to an agreed set of rules which is enforced by the blockchain. Neither sale nor art acquisitions can be completed without compliance with the DAO (SuperRare® Labs 2023). This allows international art dealers physically located in different continents to be able to trade safely and securely with each other. They can also trade with other individuals and organisations who are not members of their DAO, provided other existing DAO members agree. In this sense, DAOs are internet-native entities which are collectively owned and managed by their members, each of whom could live in different countries (Penningtons Manches Cooper 2023).

Crane (Sotheby's 2023) makes the critical observation that Web3 is disrupting the art world, breaking the status quo. Power has shifted away from art galleries and museums to decentralised networks and artist-to-fan-based communities. Art houses were at the seat of power, having a bureaucratic gatekeeping role, being entrusted to validate the provenance of contemporary or legacy art (Yanger and Davis 2021, 5–7 m and 46–48 m; Natalee 2022). Unestablished artists need to attend art fairs, degree shows and incubator galleries to present their wares. New artists hope to receive favourable recognition from long-established internationally respected institutions, attending these low-level art exhibitions (Crane 2023). Artists are now able to display their art on social media platforms and increase their exposure, as new people say they "like" what they have seen on social media. The new artist receives exposure from another source of people, who are on the friends list of a person who initially "liked" the art they directly saw. With this approach, an emerging artist is able to build up a public profile of their art, occasionally receiving an income, based on the number of visits to their social media website (Dwivedi et al. 2023, p. 56). The dawn of Web3 in the 2020s has added to the social media era of the early 21st century. "*In Web3, artist and collectors connect directly with each other, participating in the same communities and transacting without an intermediary. Artworks (in their digital form) can be displayed and distributed at the touch of a button, both in interactive virtual spaces and in the physical realm* via *projections and screens*" (Crane 2023). The decentralisation utility of Web3 has broken down traditional barriers of art institutions, enabling constituent parts of the art world to interact. In this sense, the governance role of Web3 is delivered on a decentralised surveillance basis. Here, decentralised surveillance can be defined as Web3's

ability to track the movement of every artist who has chosen to engage with a privately owned section of Web3. This helps in establishing art-item provenance, alongside issues of copyright, intellectual property rights and plagiarism. For example, the ARTRACX curator platform applies a blockchain solution to provide unique digital identities for art stakeholders' artwork and collectibles (Zhen 2023). Governance is enhanced by the fact that the blockchain technology used is supplied by an independent third party, not controlled by the ARTRACX platform. DAO governance's decentralised surveillance is able to identify who first came up with an original art image and/or a novel approach to art creation, where and when. Decentralised surveillance can also be manifest as the roles of artists, collectors, curators and producers becoming merged, delivering day-to-day surveillance as work is delivered. Every art stakeholder can see what every other constituent part is doing (Wieder 2023). These art-world stakeholder constituencies are onboarding onto art project partnerships, which facilitates decentralised art surveillance by using DAOs for governance and transparency. The art world is transitioning rapidly. In this context, Web3 is not so much about authentication and verification, but more about validation of approach, changing the status quo to reflect the diffuse nature of the art world in the 2020s. In this sense, Web3 does not seek to destroy the traditional international art market and the established systems which have developed to facilitate the process (Crane 2023). Web3, including DAOs and NFTs, will work in harmony with traditional systems, by providing outlets for the sale and purchase of international art pieces (see Figure 1).

There is the governance utility of DAOs enhanced by the development of Web3. Web3 enables each DAO to have its own individual space on the internet for business operations, alongside enabling DAOs to demonstrate how they are trading in public (Stackpole 2022). As such, Web3 is an ideal intermediary medium to acquire pieces of art when they appear on the international market. In this sense, Web3 is a chunk of the internet which has been developed by DAO users, for DAO users (Goyal 2022). The individualisation and transparency afforded by Web3 provide a governance utility, enabling it to have oversight of DAO activity. Rasmussen (Rasmussen 2021) critically articulates the ethos of cause-based DAOs. Rasmussen (2021) highlights the importance of public transparency and accountability in DAOs, to underpin and build trust and confidence in their activities. "*DAOs are part of the latest web3 movement that is decentralizing the internet by building on pubic blockchains. You can think of web3 as a kind of bookkeeping where many computers at once host data that's searchable by anyone. It's operated by users collectively, rather than a central authority*" (Rasmussen 2021).

In the process of their work, arts-based DAOs can have a number of responsibilities, for example, an organisational environmental, social and governance mandate. This is a crucial aspect that can be challenging for investment-type DAOs, who do not have the philanthropic or transparency ethos of cause-based DAOs (Mao 2023). There is also the process of disbursing funds to external accounts to fund charity work and the non-state voluntary sector's provision of public goods (see Jones 2022).[4] This must be done ideally by a supermajority of the cause-based DAOs' mutualised membership. Humans must access cause-based DAOs and positively vote in favour of significant disbursements, through individual digital account dashboards. There is an arbitrating dispute's role. Once again, this is easily implemented by mutualised members being able to vote for or against various issues that have arisen in cause-based DAO activity towards the delivery of charitable, philanthropic public goods (Sharma et al. 2023, p. 6; Troncoso 2019, p. 107). This governance factor also applies to arts-based DAOs who use NFTs to purchase art on the international market (see Figure 1) (Murray 2022, p. 58). Another legal uncertainty is manifest in consideration of where the DAO or token-centric business is actually located. DAOs have no physical form; they are a digital smart code which only exists on the internet. Similarly, many DAOs operate across multiple countries and legal jurisdictions (OECD 2022, p. 12). A requirement for an individual or organisation to disclose a 40% stake in a business operation might apply in some jurisdictions but not others. Health and safety

legislation will differ between individual countries in a similar bloc of countries. These legal questions are yet to be resolved, regarding token-centric businesses (WEF 2022, p. 8).

Governance of DAOs including cause-based DAOs is clearly crucial (Marr 2022). In the 2020s, Web3 developed, in part, to address a fundamental issue: traditional corporate governance systems had failed to prevent societally damaging business practices. Web3 is founded upon digital technology, which minimizes the reliance upon human trust and judgement. Arts-based digital blockchains enable complete transparency at each step of the DAO production process, alongside every transaction being accessible to its members (Huynh-The et al. 2023, p. 408). Previously agreed upon by humans, consensus protocols are programmed into digital cryptocurrency tokens, enabling governance, scrutiny and enforcement of the protocol by the DAO (See Figure 1). By using 2020s technology, DAOs can transition away human oversight, who can tire, make mistakes or somehow be accidentally or malevolently corrupted. Instead, Web3 delivers technologically enforced guaranteed business practice on a non-human digital basis, ensuring compliance with the human-decided consensus protocol for the DAO. This is a concept known as cryptographic truth (Chainlink 2022). I argue that, pragmatically, cryptographic truth is a digital record enabling external independent verification, that DAO activity is within the human-agreed consensus protocol (See Figure 1). Cryptographic truth carries a paradox, especially for cause-based DAOs. On the one hand, key corporate practices are carried out manually by humans; for example, boards of management vote on mergers, acquisitions or whether a new supplier be allowed onto the approved contractors list. On the other hand, governance of DAO corporate activity is enacted digitally by Web3, guaranteeing certain business practices, with no human decision making or involvement. The humans who authorised the consensus protocol and the code that was programmed into the DAO blockchain and/or humans who subsequently own DAO tokens are ultimately legally responsible for any disputes of art ownership claimed by a third party (Flick 2022, p. 12). In one sense, investment-type DAOs outperform cause-based DAOs, as they could function better with automated Web3 governance, ensuring compliance, whereas cause-based DAOs may not be able to respond as quickly or as well to curb reputational damage if the cause they are supporting somehow becomes tainted due to a publicised scandal. In practice, it may be difficult for an arts-based or cause-based DAO to coerce sufficient numbers of its mutualised members, a supermajority, to change direction (Veitch 2023; Sims 2020, p. 452). This has legal implications for not-for-profit DAOs if there are complaints that organisational delay in responding has resulted in maladministration, causing distress. An arts-based or cause-based DAO may not have sufficient agility to change the parameters of its previously agreed-upon charitable remit or the consensus protocol controlling its business operations quickly enough (See Figure 1). A business remit is the strategic investment DAO equivalent of a corporate or ESG (environmental, sustainability, governance) consensus protocol (Petratos et al. 2020, p. 87).[5]

Dwivedi et al.'s (2022) "Metaverse beyond the hype" study analyses a number of aspects of governance regarding Web3. When Dwivedi et al. (2022) use the phrase "metaverse", by proxy, they are referring to the latest development of the worldwide web internet, Web3. Stefan Koos makes a telling contribution to Dwivedi et al. (2022), which encapsulates the paradox between the use of DAOs and NFTs in Web3. There needs to be a balanced approach when interacting with Web3 that incorporates access to human agency for governance and oversight. NFTs can be used to buy and sell property, unique travelling adventures and digital images in Web3. As more and more societal services are consumed during Web3 access, who governs Web3 will become an increasingly pressing societal concern. How Web3 will be regulated will have a profound effect upon arts-based DAOs who use NFTs for verification and governance purposes. There are issues of jurisdiction (where did the art purchased originate from) and intellectual property rights (who created the art, who owns it). Profit and not-for-profit DAOs have differing remits and functionalities. There is growing recognition that we must consider the governance of behaviours of people using arts-based DAOs and NFTs in Web3, not the technology itself (Bleach 2023).

> "**Proposition.** Stakeholders and governance entities need to discuss how future law can capture the ambivalence of the person in a hybrid real-digital society and the interdependence between the personality interest and economic interests of gatekeepers. Generally, the problem of distribution of responsibility and liability between platform operators and users is becoming evermore challenging for social and e-commerce platforms".
>
> (Dwivedi et al. 2022, p. 11)

Digital art has no physical form: it can be viewed electronically on a computer screen or as an augmented or virtual reality image, for example, an avatar. Theoretically, an avatar image that somebody bought the rights to could disappear, with no means or designer software to reproduce the digital meme after loss. This possibility needs to be addressed by DAO governance ensuring the purchaser of a digital art piece has a Web3 image retrieval mechanism. Digital blockchain technology can ensure there is no counterfeiting of digital art images or unauthorised access.

3.3. The Future of Web3 Governance: When DAOs and NFTs Are Used in Corporate Business and the International Art Market

Ganatra (2022) inform us that NFTs have been used in shared-ownership house purchases. Art, business and philanthropic causes can easily be linked for humanitarian purposes (G'sell and Martin-Bariteau 2022, p. 24). Military actions in Afghanistan and Ukraine have resulted in numerous art projects using NFTs to raise funds for medical equipment and emergency supplies. R3lief is an art project where 57 different artist provided work for an art collection. People then made donations and/or paid to view the art collection by purchasing an NFT (see Figure 1) (Ganatra 2022). Some of the art donated by the artists was subsequently sold; payments were made using NFTs. All the funds raised by donation entrance fees and art sales were visible on the blockchain. The funds have been used to provide medical personnel and equipment, emergency food, fuel and shelter in war-torn areas (See also Takac 2022). The most vitally important part of these international art initiatives, often supported by corporate business, is transparency and verification. Web3 has the governance utility of "*crucially providing irrefutable evidence of the usage of these funds*" (Ganatra 2022).

WEF (2023, p. 28) discuss how value-transfer DAOs use investment and acquisition strategies to achieve both corporate and philanthropic objectives. For example, the Gitcoin DAO enables people to donate to a community cause or make art purchases by way of donation grants. How the Gitcoin DAO scheme works is through people buying cryptocurrency which is then matched by other Gitcoin DAO subscribers. People then apply to the Gitcoin DAO for donation grants to advance a particular project such as an art purchase (see Figure 1), which are then approved by DAO members. Successful Gitcoin DAO bidders see various public goods delivered, which can include art purchases (Gitcoin 2023a). Art fraud is a perennial issue within the international art market, especially as people can use a DAO to remain anonymous. The Gitcoin DAO has a governance process which offers a Price of forgery (PoF) protocol, which is effectively a standard NFT and/or human verification (HV) method (Gitcoin 2023b).

> "Upala protocol ensures that Price of forgery (PoF) is defined by the market which makes Upala, accurate, responsive, and reliable (even bots cannot beat the market 😉). Every human verification method can be fairly and accurately measured with PoF".
>
> (Gitcoin 2023b)

Gitcoin (2023b) indicate that PoF is important in establishing trust and confidence in their DAO. By proxy, this issue applies to the provenance and efficacy of any art purchased by Gitcoin DAO donation grants. The PoF protocol can also identify if various human verification systems have been hacked into or compromised in some way. Similarly, HV methods will become outdated to be replaced by other alternatives as technology advances

over time. The PoF protocol can keep track of the effectiveness of other HV methods as technology develops, being able to adapt to suit. New consensus protocols (see Figure 1) will need to be formed to combat art theft and fraud in light of technological advances in the embryonic stage coming to fruition in the 2020s. In addition to the Gitcoin DAO, the WEF (2023, p. 28) identified other DAOs that operate for philanthropic purposes. The business models of MolochDAO, EduDAO, KlimaDAO and LeXPunK that deliver their objectives by using NFTs can all be adapted to enable international art purchase for investment, profit or public good.

Holcombe-James (2022, p. 44) explains how Web3 has multiple approaches to provenance which are quite innovative. The blockchain metadata enables the tracking and verification of who owns a particular piece of art at the present time. An artist, gallery, museum or private collector's NFT wallet can be checked, as all the information is made publicly available online (Vasan et al. 2022, p. 2). Guilds can form wherein multiple art collection stakeholders not in a DAO can collaborate to use a permissioned blockchain to register documented provenance information (Holcombe-James 2022, p. 45). Such an approach would address interoperability issues between independent competing galleries and museums. Web3, DAO and NFT use has gained credibility, because these systems are able to deliver the verification and valuation functions that traditional art houses provide (Kostopoulos et al. 2021, p. 13). Fine art institution valuations and DAO valuations are becoming more closely aligned and equally accepted by the industry. Authenticated provenance enables content creators, art investors and philanthropic organisations to write funding bids and reinforce marketing campaigns (Holcombe-James 2022, p. 45). Established traditional institutions have more of an insight on ancient art, the avant-garde, exoticism, impressionism and legacy art valuation. DAOs can work in tandem with traditional art houses on the hybrid delivery of physical and virtual art collections, alongside aligning art valuations.

DAO governance via Web3 is far from perfect; it is in its infancy, developing all the time as we progress through the 2020s. Web3 offers flexibility in design governance systems, which can be weighted to reflect various aspects of arts-based DAOs (Sadowski and Beegle 2023, p. 7). Some Web3 governance will be completely automated, whilst other governance approaches will be manual, hands-on and human-controlled after agreement among members. Most DAO governance will be a hybrid balance of the two. Future designs of DAOs must increase Web3 governance, scrutiny and transparency (S&P (Standard and Poor) Global Ratings, 13 July 2022, p. 22). They need to include a more user-friendly DAO alarm system. If a 10% proportion of DAO members feel there is some form of business practice problem, a general online DAO meeting must be held. This would be particularly beneficial for art collection/purchase DAOs, who may need to address some adverse information which has recently come to light (Garbers-von Boehm et al. 2022, p. 17). Often, there can be fast-moving situations, wherein art collector- or cause-based DAO members, alongside external critical observers, funders, regulators and the media, urgently request clarification. In practice, token-centric DAO members receive governance and economic returns for being token holders of a DAO. Often, there is no legal relationship between NFT and/or DAO (effectively shareholders) token holders and their DAO (See et al. 2022; WEF 2022). Votes cast are enacted by individuals who are essentially business intermediaries to implement DAO actions voted in (Mosley et al. 2022, p. 4).[6]

People who have made art purchases on the international market using NFTs might face claims that they do not own the art they have purchased (see Figure 1). NFT and/or DAO token holders also do not know the extent of their legal liabilities; this puts cryptocurrency token holders at significant risk (UK HM Treasury 2023, p. 39; Morris 2022), for example, if there was an art collection scandal where it was alleged a certain piece of art is said to have been stolen or the provenance of an art item has been seriously brought into question (Liden 2022, p. 4; Beckett 2022). From the cause-based DAO or NFT perspective, this may be an Exxon Valdez-type environmentally damaging incident or some other catastrophic event. Critical reporting could inform us that the situation which led up to the

negative event had been funded and enabled by a particular cause-based DAO. This would tarnish the reputation of that cause-based DAO, devaluing its work. If this was an international art-purchasing DAO or NFT organisation (see Figure 1), the catastrophic event would devalue current and future cryptocurrency from this source (Fundraising Regulator 2022; see also Salman and Razzaq 2019, p. 4).[7] The value of the art purchased would also decrease. This particular digital consortium would have considerable difficulties purchasing art on the international market. Other art dealers would be reluctant to let them acquire their art, for fear of reputational damage to their own art houses. Art dealers would be fearful of being seen to be associated with this particular international art digital consortium, which is said to be responsible and liable for the catastrophic event that has occurred. A late realisation that what appeared to be a traditional art piece had been created using artificial intelligence or ChatGPT may face similar opprobrium (Kuta 2022). Salman and Razzaq (2018) articulate concerns regarding cryptocurrencies, for example, Bitcoin. The world, technological implementation in the art world and individual cryptocurrency valuations can all change very quickly. "*With the market trends going anywhere with prediction, the shift is incorrigible, the facts are surprising and more shocks are due*" (Salman and Razzaq 2018, p. 271). In the early 2020s, the jury is still out regarding the use of cryptocurrencies or NFTs to fund international art purchases; they could be devalued at any time. Another financial risk is that of "wash trading", where rogue actors manipulate the market by buying and selling the same asset repeatedly; this is an illegal, fraudulent activity that artificially inflates the price of said asset (Bonifazi et al. 2023, p. 1; see also UK Parliament 2022). There is an existential threat that in-house NFTs could become derecognised. In practice, this would mean that international art dealers would not accept that particular NFT as payment. Similarly, an art house's entire collection could be deemed to be worthless, due to future derecognition of an individual set of NFTs. There could be internal reputationally damaging issues, for example, a hack of a particular blockchain resulting in the theft of large sums of money or a computer hack which brings the art's recorded history and subsequently its recognition of ownership and provenance into question. Another example would be if an NFT holder and content creator gave support to an inappropriate cause on social media or wrongly announced their art was to be exhibited at an internationally respected establishment, which subsequently did not take place (Morris 2023; Perper 2023).

4. Limitations of Study

The main limitation of this study is the rapidly evolving nature of DAOs, NFTs, technological advances and Web3, alongside Web3 governance. Six months is a long time in the digital international art market. Legal case law, multi-jurisdictions, DAOs and NFTs being recognised differently in neighbouring jurisdictions and the constant threat of NFT or cryptocurrency devaluation and/or derecognition are just some of the issues which are under-theorised and under-researched. Many of these issues in the art world are not really being discussed. The art world finds itself having to wait until these clearly foreseeable crises present themselves then devising post-crises responses. This paper intended to provide a critical overview of the main issues, which art stakeholders need to consider. Regarding DAOs and NFTs in the art world, due to the constant state of flux, this paper provides a critical snapshot of the effect of technological advances on international art purchases at this moment in time.

5. Conclusions

Arts-based, business and cause-based DAOs need to obtain the funds they raise for their philanthropic work to the intended causes or people relatively quickly (Fu 2022; Smith 2022). Corporate mutualised DAOs should consider having a portal on their website that informs people which causes were paid how much, where and when. As part of democratisation and transparency, people should be able to establish the percentage of DAO members who voted against or in favour of each payment per scheme. Web3 governance will be crucial, especially in corporate mutualised cause-based DAOs where consensus is

a must (LinkedIn 2023; Weill 2023). Cryptographic truth and computerised enactment of mutually agreed, easily measurable business activity are ideal in many cases. However, in business as in life, it is important that humans remain in control and able to steer a DAO away from its predicted path. This emphasis on human agency becomes particularly acute if it becomes apparent that support of a previously agreed-upon scheme will cause reputational damage to the arts-based DAO (Newberry 2023; Weinstein et al. 2022; Khan et al. 2021, p. 2917).

Engaging with Web3 will be made more user-friendly as the 2020s progress (Mesidor 2023). Artists, business entrepreneurs and philanthropists will be able to use DAOs and NFTS in their work. People will be able to use emails and credit cards that automatically update public blockchains as they offer their business services or publish their art (Radermecker and Ginsburgh 2023, p. 10). Any individual or organisation will be able to onboard themselves, building their own niche in Web3. NFTs facilitate an interface between business and artists and their customers or fans wanting access to the goods or content supplied (Natalee 2023).

NFTs' established footholds in facilitating purchases in fine art institutions (see Figure 1) will stabilise if not increase in the 2020s. Auction houses, for example, Christie's and Sotheby's, will continue to sell contemporary digital art and legacy art using NFTs (Christie's 2023; Sotheby's 2023). Using cryptocurrency will help auction houses demonstrate the provenance of the art items they are selling. NFTs will act to connect emerging, not-yet-established, creative artists to new audiences (Evans 2023; Bogomolny 2022). Art galleries and museums will also continue to do business, delivering art and virtual reality displays. They will commission artists and content creators to create interactive and/or immersive experiences using Web1 and Web3 to engage with younger audiences. Art galleries and museums will offer parts of their services by enabling people to buy tickets to certain exhibitions using NFTs. DAOs will be used to facilitate the process, providing business governance of how fine art institutions are managed (Jing Culture & Crypto 2023; Liddell 2022, p. 79; Zhang 2022). As the 2020s progress, physical art gallery and museum closures will continue apace, due to dwindling attendances and business running costs. The service will deliver interactive experiences, which are accessed by purchasing a NFT to visit art galleries and museums online. Museums will drop specialised, commemorative NFTs occasionally, alongside the selling of NFT token images of classic art (Hickley 2022, p. 33). There will be a proliferation of NFT museums which feature NFTs themselves, exhibiting visual displays of codes that brought a particular NFT into being. Traditional and digital art houses should adopt a policy of auditing and checking any item they deal with to authenticate NFTs. They should also audit any smart contract by checking the blockchain to provide their clients with a true record of previous ownership (Oleh 2023; Schroeders Wealth Management 2022). There have been notable NFT hacks during the early 2020s, where malicious internet actors have seized valuable assets and funds from their rightful owners. Azuki's Twitter hack enabled the spread of a phishing link amongst this anime's NFT collection followers. As part of the OMNI Real Estate exploit, people bought fraudulent accommodation tokens for non-existent hotel rooms (Oleh 2023). Both these examples would result in a significant loss of trust and confidence, a vital ingredient in the international art market.

Funding: This research received no external funding.

Data Availability Statement: This critical conceptual theoretical review, was written after an analysis of relevant literature, all of which is publicly available on the internet.

Conflicts of Interest: The author declares no conflict of interest.

Notes

[1] A DAO could be programmed to comply with state or non-state funding agencies within a particular country or jurisdiction, for example, Arts Council funding in the UK.

[2] Debbie Blockchain is a Publishing DAO who went dormant 5 February 2021. Ensembl is an Ethereum-based platform for decentralised organising of artistic production.

[3] Elzeweig and Trautman (2023, p. 320) observe: The United States Security and Exchange Commission' 2017 'DAO Report' describe DAO token holders afforded voting rights as limited.

[4] Jones' (2022) article advises readers to keep an eye on, amongst other things, 'Blockchain' and 'Cryptocurrencies', charity governance is key. Jones (2022) provides an early indication that many small charities and voluntary sector groups will transform into cause based DAOs during the 2020s.

[5] Petratos et al. (2020) discuss the emergence of blockchain technology in technological innovations, investment and sustainability. Digital finance is mentioned, which has a key role in purchasing, alongside marketing, exchange, and recording transactions in the international art market.

[6] Mosley et al.' (2022) 'systematic understanding of blockchain governance' study, identifies how DAOs can have a number of potential voting vulnerabilities. These are governance vulnerabilities that can subvert the outcome of proposals, which are then subsequently actioned by DAO intermediaries.

[7] Salman and Razzaq (2019) discuss Bitcoins and how this cryptocurrency can wildly fluctuate in value. Salman et al' pre-2020s study, warned then of the problems of the lack of regulation of cryptocurrencies. A sudden devaluation of a cryptocurrency would have a significant effect upon the reputation of an art house. A museum or gallery who bought an art piece using a particular cryptocurrency a few short weeks before its exchange rate fell sharply; would find that not only has the value of the art piece purchased fallen, but so would the art house's reputational stock on the international market. This financial risk problem has not been solved by art based DAOs using NFTs to buy and sell art. NFTs have solved provenance, ownership and historical transaction problems; they have not solved the financial risk posed by a sudden devaluation or de-recognition of a particular NFT in the open art market.

References

Alex, ed. 2023. 'Record Labels Are Dying!! #IndieIsTheNewNorm—Here's Why…'. *Music Lowdown*, April 12. Available online: https://musiclowdown.co.uk/record-labels-dying/(accessed on 3 August 2023).

Ali, Omar, Mujtaba Momin, Anup Shrestha, Ronnie Das, Fadia Alhajj, and Yogesh K. Dwivedi. 2023. 'A review of the key challenges of non-fungible tokens'. *Technological Forecasting and Social Change* 187: 122248. [CrossRef]

Ambolis, Diana. 2023. NFT-based DAOs: How NFTs are Changing the Game in Web 3.0. *Blockchain Magazine*, May 16. Available online: https://blockchainmagazine.net/nft-based-daos-how-nfts-are-changing-the-game-in-web-3-0/ (accessed on 1 August 2023).

Andrew, Gretchen. 2023. What are DAOs? How blockchain-governed collectives might revolutionise the artworld. *The Art Newspaper*, February 23. Available online: https://www.theartnewspaper.com/2023/02/23/what-are-daos-how-blockchain-governed-collectives-might-revolutionise-the-art-world (accessed on 30 July 2023).

Arts Council. 2023. CRF: Information for applicants offered funding. *Arts Council: Culture Recovery Fund*. Available online: https://www.artscouncil.org.uk/culture-recovery-fund/crf-information-applicants-offered-funding (accessed on 4 August 2023).

B (@beatyandpunk). 2022. The New Patrons: NFT Collectors and Supporters. *Art Basel Conversations*, June 16. Available online: https://www.artbasel.com/stories/conversations-art-basel-2022-nft-collectors-and-supporters?lang=en (accessed on 25 February 2023).

Becker, H. S. 1982. *Art Worlds*. Los Angeles and London: University of California Press. Available online: https://sabrinasoyer.files.wordpress.com/2016/05/howard-s-becker-art-worlds.pdf (accessed on 30 July 2023).

Beckett, Lois. 2022. 'Huge mess of theft and fraud:' artist sound alarm as NFT crime proliferates. *The Guardian*, January 29. Available online: https://www.theguardian.com/global/2022/jan/29/huge-mess-of-theft-artists-sound-alarm-theft-nfts-proliferates (accessed on 5 March 2023).

Biais, Bruno, Christophe Bisiere, Matthieu Bouvard, Catherine Casamatta, and Albert J. Menkveld. 2023. Equilibrium Bitcoin Pricing. *The Journal of Finance (The Journal of THE AMERICAN FINANCE ASSCIATION)* 78: 967–1014. [CrossRef]

Binance. 2022. What is a DAO and How Does it Benefit NFTs. *Binance Blog*, June 22. Available online: https://www.binance.com/en/blog/nft/what-is-a-dao-and-how-does-it-benefit-nfts-421499824684903992 (accessed on 31 July 2023).

Bleach, Tom. 2023. Web3 Foundation Calls for Regulatory Clarity But Warns Rules Should Address Behaviours Not Technology. *The Fintech Times*, June 30. Available online: https://thefintechtimes.com/web3-regulation-clarity-behaviours-technology/ (accessed on 4 August 2023).

Bogomolny, Sara. 2022. NFTs: Digital Renaissance or Death Knell of Traditional Art? *Arts Management & Technology Library*, June 14. Available online: https://amt-lab.org/blog/2022/6/nfts-digital-renaissance-or-death-knell-of-traditional-art (accessed on 8 February 2023).

Bonifazi, Gianluca, Francesco Cauteruccio, Enrico Corradini, Michele Marchetti, Daniele Montella, Simone Scarponi, Domenico Ursino, and Luca Virgili. 2023. Performing Wash Trading on NFTs: Is the Game Worth the Candle? *Big Data and Cognitive Computing* 7: 38. [CrossRef]

British Phonographic Industry. 2021. *Match of the Day: The Intersection of Music and Sport*. December. London: British Phonographic Industry (BPI). Available online: https://www.bpi.co.uk/media/3140/bpi4.pdf (accessed on 12 February 2023).
Bron, Daniel. 2023. 10 Ways Web3 is Disrupting Traditional Business Models. *LinkedIn Pulse*, April 4. Available online: https://www.linkedin.com/pulse/10-ways-web3-disrupting-traditional-business-models-daniel-bron- (accessed on 16 April 2023).
Carter, Rebekah. 2023. Why DAOs Matter and Why they Impact NFTs. *XR Today*, June 1. Available online: https://www.xrtoday.com/mixed-reality/why-daos-matter-and-why-they-impact-nfts/ (accessed on 1 August 2023).
Chainlink. 2022. DAOs and the Complexities of Web3 Governance. *Blog*, August 6. Available online: https://blog.chain.link/daos/ (accessed on 5 February 2023).
Chalmers, Dominic, Christian Fisch, Russell Matthews, William Quinn, and Jan Recker. 2022. Beyond the bubble: Will NFTs and digital proof of ownership empower creative industry entrepreneurs? *Journal of Business Venturing Insights* 17: e00309. [CrossRef]
Christie's. 2023. Digital Art and NFTs. Available online: https://www.christies.com/en/events/digital-art-and-nfts/overview (accessed on 21 May 2023).
Cornelius, Kristin. 2021. Betraying Blockchain: Accountability, Transparency and Document Standards for Non-Fungible Tokens (NFTs). 2021. *Information* 12: 358. [CrossRef]
Crane, Diana. 1976. Reward Systems in Art, Science and Religion. *American Behavioral Scientist* 19: 719–34. [CrossRef]
Crane, Leo. 2023. Reframing the Art Market Ecosystem in a Web3 World. *Sotheby's Institute of Art*, February 13. Available online: https://www.sothebysinstitute.com/news-and-events/news/reframing-art-market-ecosystem-in-web3-world (accessed on 19 February 2023).
Danto, Arthur. 1964. The Artworld. *The Journal of Philosophy* 61: 571–84. Available online: https://is.muni.cz/el/phil/jaro2014/IM088/Danto__1_.pdf (accessed on 30 July 2023). [CrossRef]
De Filippi, Primavera, Morshed Mannan, and Wessel Reijers. 2020. Blockchain as a confidence machine: The problem of trust & challenges of governance. *Technology in Society* 62: 101284. [CrossRef]
Debbie Blockchain and Ensembl. 2021. Hong Kong DAOs. *Goethe Institute*, February 5. Available online: https://www.goethe.de/ins/gb/en/kul/zut/dao/dah.html (accessed on 12 February 2023).
Denny, Simon. 2023. NFTs: An artists perspective. *Art Basel*. Available online: https://www.artbasel.com/stories/art-market-report-nfts-simon-denny?lang=en (accessed on 30 July 2023).
De Nooy, Wouter. 2002. The dynamics of artistic prestige. *Poetics* 30: 147–67. [CrossRef]
Drake, Josh. 2022. How we finally evolve from Web2 to Web3. *VentureBeat*, February 13. Available online: https://venturebeat.com/datadecisionmakers/how-we-can-finally-evolve-from-web-2-0-to-web-3-0/ (accessed on 3 August 2023).
Dwivedi, Yogesh K., Laurie Hughes, Abdullah M. Baabdullah, Samuel Ribeiro-Navarette, Mihalis Giannakis, Mutas M. Al-Debei, Denis Dennehy, Christy M. K. Cheung, Kieran Conboy, Samuel Fosso Wamba, and et al. 2022. Metaverse beyond the hype: Multidisciplinary on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management* 66: 102542. [CrossRef]
Dwivedi, Yogesh. K., Nir Kshetri, Laurie Hughes, Emma Louise Slade, Anand Jeyaraj, Arpan Kumar Kar, Abdullah M. Baabdullah, Alex Koohang, Vishnupriya Raghavan, Ryan Wright, and et al. 2023. Opinion Paper: "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implication of generative conversational AI for research, practice and policy. *International Journal of Information Management* 71: 102642. [CrossRef]
Ehrlich, Steven. 2023. What is Web3? *Forbes*, March 10. Available online: https://www.forbes.com/sites/digital-assets/article/what-is-web3/?sh=374f827667a4 (accessed on 3 August 2023).
Elzeweig, Brian, and Lawrence J. Trautman. 2023. When Does a Non-Fungible Token (NFT) Become a Security? *Georgia State University Law Review* 39: 295–336. Available online: https://readingroom.law.gsu.edu/cgi/viewcontent.cgi?article=3184&context=gsulr (accessed on 2 August 2023).
Evans, Brian D. 2023. Hollywood Meet Art: How NFTs Are Revolutionizing the Entertainment Industry. *Rolling Stone*, May 17. Available online: https://www.rollingstone.com/culture-council/articles/hollywood-meets-art-nfts-revolutionizing-entertainment-industry-1234736416/ (accessed on 4 August 2023).
Fan, Yuqing, Tianyi Huang, Yiran Meng, and Shenghui Cheng. 2023. The current opportunities and challenges of Web 3.0. *arXiv*, 1–23. Available online: https://arxiv.org/pdf/2306.03351.pdf (accessed on 3 August 2023).
Flamingo, Julia. 2023. What are DAOs and what can they bring to the art world? *Art Curator Grid*, February 22. Available online: https://blog.artcuratorgrid.com/what-can-daos-bring-to-the-art-world/ (accessed on 4 August 2023).
Flick, Catherine. 2022. A critical professional ethical analysis of Non-Fungible Tokens (NFTs). *Journal of Responsible Technology* 12: 100054. [CrossRef]
Foucher, Simon, Charles Denis, and Matthis Grosjean. 2023. Web3 & customer engagement. *Sia Partners*, White Paper 02. Available online: https://www.sia-partners.com/system/files/document_download/file/2023-07/WP%20Web3%20%26%20Customer%20engagement%20-%20SiaXperience%20x%20METAV.RS%20x%20Zealy.pdf (accessed on 4 August 2023).
Freeman Law. 2022. The History of Blockchain and Bitcoin. *Freeman Law*. Available online: https://freemanlaw.com/the-history-of-the-blockchain-and-bitcoin/ (accessed on 5 February 2023).
Fritsch, Felix, Jeff Emmett, Emaline Friedman, Rok Kranj, Sarah Manski, Michael Zargham, and Michel Bauwens. 2021. Challenges and Approaches to Scaling the Global Commons. *Frontiers in Blockchain* 4: 578721. [CrossRef]

Fu, Yan Lin. 2022. How DAOs are Funded. *ConsenSys*, December 7. Available online: https://consensys.net/blog/metamask/metamask-institutional/how-daos-are-funded/ (accessed on 5 March 2023).
Fundraising Regulator. 2022. Cryptocurrencies, NFTs and the Future of Fundraising. May 3. Available online: https://www.fundraisingregulator.org.uk/more-from-us/news/cryptocurrencies-nfts-and-future-fundraising (accessed on 5 March 2023).
G'sell, Florence, and Florian Martin-Bariteau. 2022. The Impact of Blockchains for Human Rights, Democracy, and the Rule of Law. *Council of Europe*. Information Society Department, DGI2022.06. September. Available online: https://rm.coe.int/report-on-blockchains-en/1680a8ffc0 (accessed on 26 February 2023).
Ganatra, Raj. 2022. Web3 and Art: Unlocking the Future of Humanitarian Justice. *Human Rights Pulse*, June 18. Available online: https://www.humanrightspulse.com/mastercontentblog/web3-and-art-unlocking-the-future-of-humanitarian-justice (accessed on 8 February 2023).
Garbers-von Boehm, Katherina, Helena Hagg, and Katherina Gruber. 2022. Intellectual Property Rights and Distributed Ledger Technology: With a focus on art NFTs and tokenised art. *European Parliament Study*. PE 737.709. October. Available online: https://www.europarl.europa.eu/RegData/etudes/STUD/2022/737709/IPOL_STU2022.737709_EN.pdf (accessed on 28 February 2023).
GFS IT Solutions. 2023. Riding the Bandwagons of NFTs—Becoming a Part of Evolving World of NFT. *LinkedIn Pulse*, April 11. Available online: https://www.linkedin.com/pulse/riding-bandwagon-nfts-becoming-part-evolving-world-gfs-it-solutions (accessed on 16 April 2023).
Gilbert, Sam. 2022. Crypto, Web3, and the Metaverse. *University of Cambridge, Bennett Institute for Public Policy*. Policy Brief. March. Available online: https://www.bennettinstitute.cam.ac.uk/wp-content/uploads/2022/03/Policy-brief-Crypto-web3-and-the-metaverse.pdf (accessed on 15 February 2023).
Gitcoin. 2023a. Donate to Gitcoin Grants. Available online: https://www.gitcoin.co/ (accessed on 2 August 2023).
Gitcoin. 2023b. Benefits of Using Price of forgery in Gitcoin. Available online: https://gov.gitcoin.co/t/benefits-of-using-price-of-forgery-in-gitcoin/11314 (accessed on 13 August 2023).
Giuffre, Katherine. 1999. Sandpiles of Opportunity: Success in the Art World. *Social Forces* 77: 815–32. [CrossRef]
Glaveski, Steve. 2022. How DAOs Could Change the Way We Work. *Harvard Business Review*, April 7. Available online: https://hbr.org/2022/04/how-daos-could-change-the-way-we-work (accessed on 5 February 2023).
Goyal, Shubham. 2022. Web3 incoming: How far is it? *Delta Exchange Blogs*, July 15. Available online: https://www.delta.exchange/blog/web3-incoming-how-far-is-it/ (accessed on 5 February 2023).
Hackl, Cathy. 2021. What Are DAOs and Why You Should Pay Attention. *Forbes*, June 1. Available online: https://www.forbes.com/sites/cathyhackl/2021/06/01/what-are-daos-and-why-you-should-pay-attention/?sh=635570a37305 (accessed on 28 February 2023).
Hedera.com. 2023. Web3 vs Metaverse: The Differences and Connections. Available online: https://hedera.com/learning/metaverse/web3-vs-metaverse#:~:text=you'll%20understand%3A-,Web%203.0%20is%20a%20concept%20for%20a%20decentralized%20version%20of,metaverse%20environments%20incorporate%20web3%20technology (accessed on 1 August 2023).
Hickley, Catherine. 2022. Art market goes crypto with NFTs. The UNESCO Courier, (United Nations Education, Scientific and Cultural Organization), 3, pp. 30–33. July–September. Available online: https://unesdoc.unesco.org/ark:/48223/pf0000382095_eng (accessed on 26 March 2023).
Hilsberg, Victoria. 2023. DAOs and NFTs—what in the interconnection is going on? *Medium*, May 21. Available online: https://medium.com/@vic.hilsberg/daos-and-their-implications-to-the-nft-space-ab0030bebde4 (accessed on 1 August 2023).
Holcombe-James, Indigo. 2022. Where Are Web3 Technologies Being Used? In *Developments in Web3 for the Creative Industries: A Research Report for the Australian Council for the Arts*. Edited by Ellie Rennie, Indigo Holcombe James, Alana Kushnir, Tim Webster and Benjamin A. Morgan. Melbourne: RMIT Blockchain Innovation Hub, November, pp. 43–48. Available online: https://apo.org.au/sites/default/files/resource-files/2022-11/apo-nid319849.pdf (accessed on 12 February 2023).
Huang, Ying, and Maximilian Mayer. 2022. Digital currencies, monetary sovereignty and U.S.-China power competition. *Policy & Internet* 14: 324–47. [CrossRef]
Huynh-The, Thien, Thippa Reddy, Weizheng Wang, Gokol Yenduri, Pasika Ranaweera, Quoc.-Viet Pham, Daniel Benevides da Costa, and Madhusanka Liyananage. 2023. Blockchain for the metaverse: A Review. *Future Generation Computer Systems* 143: 401–19. [CrossRef]
Jing Culture & Crypto. 2023. Cultural Bits and Bites. *Jing Travel*, August 20. Available online: https://jingculturecrypto.com/bits_n_bites/chinese-tourism-cultural-bit-n-bites/ (accessed on 20 August 2023).
Jones, Ioan Marc. 2022. Top fundraising tips for 2022. *Charity Digital*, August 15. Available online: https://charitydigital.org.uk/topics/topics/top-fundraising-trends-for-2022-9180 (accessed on 5 February 2023).
Kaul, Sandy. 2023. Evolution & Revolution: Understanding Web3 and digital assets—Franklin Templeton's new primer. *Franklin Templeton Institute*, July 31. Available online: https://franklintempletonprod.widen.net/content/ykjfzcquke/pdf/understanding-web3-and-digital-assets-a.pdf?_gl=1*1t8fv7e*_ga*NTUwMDU3MjQ0LjE2OTIzODg0Mjg.*_ga_15V8ZZDP8Z*MTY5MjM4ODQyNy4xLjEuMTY5MjM4ODUwMi4wLjAuMA (accessed on 3 August 2023).
Khan, Shafaq Naheed, Faiza Loukil, Chirine Ghedira-Guegan, Elhadj Benkhelifa, and Anoud Bani-Hani. 2021. Blockchain smart contracts: Applications, challenges, and future trends. *Peer-to-Peer Networking and Applications* 14: 2901–25. [CrossRef]

Kostopoulos, Nikos, Tonia Damrakeraki, Lambis Dionysopoulos, Marianna Charalambous, George Giaglis, Zalan Noszek, Iordani Papoutsoglou, Konstantnos Votis, Ishan Roy, Jeff Bandmen, and et al. 2021. *Demystifying Non-Fungible Tokens (NFTs)*. Brussels: The European Union Blockchain Observatory & Forum. Available online: https://www.eublockchainforum.eu/sites/default/files/reports/DemystifyingNFTs_November%202021_2.pdf (accessed on 26 February 2023).

Kuta, Sarah. 2022. Art Made With Artificial Intelligence Wins at State Fair. *Smithsonian Magazine*, September 6. Available online: https://www.smithsonianmag.com/smart-news/artificial-intelligence-art-wins-colorado-state-fair-180980703/ (accessed on 4 August 2023).

Layton, Roslyn. 2022. NFTs for Art and Philanthropy Could be Crypto's Next Act. *Forbes*, September 27. Available online: https://www.forbes.com/sites/roslynlayton/2022/09/27/its-not-yet-curtains-for-crypto/?sh=325bf4147d62 (accessed on 5 February 2023).

Legge, Michelle. 2023. DAOs: Your Guide to Decentralized Autonomous Organizations. *Koinly*, July 5. Available online: https://koinly.io/blog/daos-decentralized-autonomous-organizations/ (accessed on 4 August 2023).

Liddell, Frances V. 2022. The Crypto-Museum: Investigating the impact of blockchain and NFTs on digital ownership, authority, and authenticity in museums. Ph.D. thesis, University of Manchester, School of Arts, Languages and Cultures, Manchester, UK. Available online: https://pure.manchester.ac.uk/ws/portalfiles/portal/216118534/FULL_TEXT.PDF (accessed on 5 February 2023).

Liden, Erik. 2022. Potential Advantages and Disadvantages of NFT-Applied Digital Art. Master's thesis, Uppsala University, Uppsala, Sweden, July 6. Available online: https://www.diva-portal.org/smash/get/diva2:1675570/FULLTEXT01.pdf (accessed on 5 March 2023).

LinkedIn. 2023. How can you use DAOs for better Web3 governance? *LinkedIn: Web3*, August 17. Available online: https://www.linkedin.com/advice/0/how-can-you-use-daos-better-web3-governance-skills-web3 (accessed on 20 August 2023).

Makridis, Christos A., and Esther Larson. 2023. How blockchain can help fund artists—and revive the arts. *Philanthropy Daily*, March 9. Available online: https://philanthropydaily.com/how-blockchain-can-help-fund-artists-and-revive-the-arts/ (accessed on 12 March 2023).

Mao, Xinrou. 2023. Is dao a utopia? Its past, ongoing practice and the future. *Massachusetts Institute of Technology*, March 10. Available online: https://www.outofframe.mit.edu/allposts/hojlvdun1w2x8hwg40dowxj0n3wtym (accessed on 19 March 2023).

Marr, Bernard. 2022. The Best Examples of DAOs Everyone Should Know About. *Forbes*, May 25. Available online: https://www.forbes.com/sites/bernardmarr/2022/05/25/the-best-examples-of-daos-everyone-should-know-about/?sh=1fc48fd40c3c (accessed on 5 February 2023).

Mateus, Sara, and Soumodip Sarkar. 2023. Can Decentralized Autonomous Organizations (DAOs) Revolutionize Healthcare? *California Management Review*, January 2. Available online: https://cmr.berkeley.edu/assets/documents/pdf/2023-01-can-decentralized-autonomous-organizations-daos-revolutionize-healthcare.pdf (accessed on 15 February 2023).

McKenna, Saro. 2023. How DAOs Can Turn The NFT Rebound Into A Web3 Success Story. *Forbes*, August 9. Available online: https://www.forbes.com/sites/forbestechcouncil/2023/08/09/how-daos-can-turn-the-nft-rebound-into-a-web3-success-story/?sh=7bd48125503b (accessed on 13 August 2023).

Mesidor, Cleve. 2023. Crypto Artists Share How Web3 Tools Enable Diverse Art Market Experiments. *Forbes*, May 1. Available online: https://www.forbes.com/sites/digital-assets/2023/05/01/crypto-artists-share-how-web3-tools-enable-diverse-art-market-experiments/?sh=4833785a64b0 (accessed on 21 May 2023).

Morris, David Z. 2023. CoinDesk Turns 10—How The DAO Hack Changed Ethereum and Crypto. *CoinDesk*, May 15. Available online: https://www.coindesk.com/consensus-magazine/2023/05/09/coindesk-turns-10-how-the-dao-hack-changed-ethereum-and-crypto/ (accessed on 21 May 2023).

Morris, Jane. 2022. Can NFTs make a comeback. *Apollo*, November 30. Available online: https://www.apollo-magazine.com/nfts-art-market-crypto-crash-digital-art/ (accessed on 5 March 2023).

Mosley, Lawrence, Hieu Pham, Xiaoshi Guo, Yogesh Bansal, Eric Hare, and Nadia Antony. 2022. Towards a systematic understanding of blockchain governance in proposal voting: A dash case study. *Blockchain: Research and Applications* 3: 100085. [CrossRef]

Mues, Adela, Soham Panchamiya, Matthew Townsend, Hagen Rooke, Brett Hillis, Jonathan T. Ammons, and Mira Bagaeen. 2023. ADGM Regulations on Virtual Assets and Decentralized Autonomous Organization. *Reed Smith Client Alerts*, April 21. Available online: https://www.reedsmith.com/en/perspectives/2023/04/adgm-regulations-on-virtual-assets (accessed on 4 August 2023).

Mukaddam, Farah. 2021. NFTs and Intellectual Property Rights. Norton Rose Fulbright, October. Available online: https://www.nortonrosefulbright.com/en/knowledge/publications/1a1abb9f/nfts-and-intellectual-property-rights (accessed on 5 February 2023).

Murray, Michael D. 2022. NFTs and the Art World—What's Real, and What's Not. *UCLA Entertainment Law Review* 29: 25–58. [CrossRef]

Natalee. 2022. NFT Provenance and how it will change Art forever. *NFT Culture*, August 22. Available online: https://www.nftculture.com/guides/nft-provenance-and-how-it-will-change-art-forever/ (accessed on 15 February 2023).

Natalee. 2023. Beyond the Pixels: Decoding Web3 Gaming and NFT Challenges. *NFT Culture*, June 1. Available online: https://www.nftculture.com/nft-news/beyond-the-pixels-decoding-web3-gaming-and-nft-challenges/ (accessed on 4 June 2023).

Newberry, Deborah. 2023. Mitigating future risk: Anticipating reputational exposures in an ESG-conscious world. *Kennedys Law*, April 23. Available online: https://kennedyslaw.com/en/thought-leadership/article/2023/mitigating-future-risk-anticipating-reputational-exposures-in-an-esg-conscious-world/ (accessed on 21 May 2023).

OECD (Organisation for Economic Co-operation and Development). 2022. *Why Decentralised Finance (DeFi) Matters and the Policy Implications*. Paris: OECD. Available online: https://www.oecd.org/daf/fin/financial-markets/Why-Decentralised-Finance-DeFi-Matters-and-the-Policy-Implications.pdf (accessed on 19 February 2023).

Oleh, Malanii. 2023. NFT Smart Contract Audit: Ultimate Guide. *HACKEN*, June 2. Available online: https://hacken.io/discover/security-audit-for-nft-guide-for-founders-and-managers/ (accessed on 4 August 2023).

Park, Hyejin, Ivan Ureta, and Boyoung Kim. 2023. Trend Analysis of Decentralized Autonomous Organizations Using Big Data Analytics. *Information* 14: 326. [CrossRef]

Penningtons Manches Cooper. 2023. Decentralised Autonomous Organisations—The New Frontiers for Corporate Structures, March 9. Available online: https://www.penningtonslaw.com/news-publications/latest-news/2023/decentralised-autonomous-organisations-the-new-frontier-for-corporate-structures (accessed on 19 March 2023).

Perper, Rosie. 2023. The NFT Louvre Exhibit That Wasn't: Untangling the Public Mess of a Non-Event. *CoinDesk*, March 17. Available online: https://www.coindesk.com/web3/2023/03/17/the-nft-louvre-exhibit-that-wasnt-untangling-the-public-mess-of-a-non-event/ (accessed on 21 May 2023).

Petratos, Pythagoros N., Nikolina Ljepava, and Asma Salman. 2020. Blockchain Technology, Sustainability and Business: A Literature Review and the Case of Dubai and UAE. In *Sustainable Development and Social Responsibility—Volume 1: Proceedings of the 2nd American University in the Emirates International Research, AUEIRC'18—Dubai, UAE 2018*. Edited by Miroslav Mateev and Jennifer Nightingale. Cham: Springer, pp. 87–93. [CrossRef]

Radermecker, Anne-Sophie V., and Victor Ginsburgh. 2023. Questioning the NFT "Revolution" withing the Art Ecosystem. *Arts* 12: 25. [CrossRef]

Rasmussen, Emily. 2021. Philanthropy on the Blockchain: Giving DAOS and the Next Generation of Giving Circles. *Dorothy A. Johnson Center for Philanthropy*, December 14. Available online: https://johnsoncenter.org/blog/philanthropy-on-the-blockchain-giving-daos-and-the-next-generation-of-giving-circles/ (accessed on 5 February 2023).

Ray, Partha Pratim. 2023. Web3: A comprehensive review on background, technologies, applications, zero-trust architectures, challenges and future directions. *Internet of Things and Cyber-Physical Systems* 3: 213–48. [CrossRef]

Rennie, Ellie. 2022. What is Web3? In *Developments in Web3 for the Creative Industries: A Research Report for the Australian Council for the Arts*. Edited by Ellie Rennie, Indigo Holcombe James, Alana Kushnir, Tim Webster and Benjamin A. Morgan. Melbourne: RMIT Blockchain Innovation Hub, November, pp. 11–23. Available online: https://apo.org.au/sites/default/files/resource-files/2022-11/apo-nid319849.pdf (accessed on 12 February 2023).

Ritter-Doring, Verena, Charlotte Hill, and Miroslav Duric. 2023. That'll be the DAO: An overview of the structure and status of decentralised autonomous organisations under English Law. *Taylor Wessing*, April 4. Available online: https://www.taylorwessing.com/en/insights-and-events/insights/2023/04/that-will-be-the-dao (accessed on 11 April 2023).

Roose, Kevin. 2022. What are DAOs? The Latecomer's Guise to Crypto. *The New York Times*, March 18. Available online: https://www.nytimes.com/interactive/2022/03/18/technology/what-are-daos.html (accessed on 5 February 2023).

Sadowski, Jathan, and Kaitlin Beegle. 2023. Expensive and extractive networks of Web3. *Big Data & Society* 10: 1–14. [CrossRef]

Saito, Yoshiro, and John A. Rose. 2023. Reputation-based Decentralized Autonomous Organizations for the non-profit section: Leveraging blockchain to enhance good governance. *Frontiers in Blockchain* 5: 1083647. [CrossRef]

Salman, Asma. 2019. Digital Currencies and the Power Shift in the Economy. In *Creative Business and Social Innovations for a Sustainable Future*. Edited by Miroslav Mateev and Panikkos Poutziouris. Advances in Science, Technology & Innovation (IEREK Interdisciplinary Series for Sustainable Development). Cham: Springer, pp. 123–31. [CrossRef]

Salman, Asam, and Muthanna G. Abdul Razzaq. 2018. Bitcoin and the World of Digital Currencies, Financial Management from an Emerging Market Perspective. In *Financial Management from an Emerging Market Perspective*. Edited by Guray Kucukkocaoglu and Soner Gokten. London: IntechOpen, pp. 269–81. Available online: https://www.intechopen.com/chapter/pdf-download/57380/6569117 (accessed on 30 July 2023).

Salman, Asma, and Muthanna G. Abdul Razzaq, eds. 2019. *Blockchain and Cryptocurrencies*. London: IntechOpen. [CrossRef]

Schillig, Michael Anderson. 2023. Decentralized Autonomous Organizations (DAOs) Under English law. *Law and Financial Markets Review*, February 20. [CrossRef]

Schindler, Steve, and Kate Wilson-Milne. 2023. The Promise of NFTs for Art and the Art Market. *The Art Law Podcast*. Interview with Amy Whittaker. March 1. Available online: https://artlawpodcast.com/2023/03/01/the-promise-of-nfts-for-artists-and-the-art-market/ (accessed on 2 August 2023).

Schroeders Wealth Management. 2022. What are NFTs and How Do They Work in the Art World, June 15. Available online: https://www.schroders.com/en-ch/ch/wealth-management/insights/what-are-nfts-and-how-do-they-work-in-the-art-world/ (accessed on 5 February 2023).

See, Geoffrey, Ashlin Perumall, and Assel Zhannasova. 2022. Are 'Decentralized Autonomous Organisations' the Business Structures of the Future?'. *World Economic Forum*, June 23. Available online: https://www.weforum.org/agenda/2022/06/are-dao-the-business-structures-of-the-future/ (accessed on 5 February 2023).

Sharma, Tanusree, Yujin Kwon, Kornrapat Pongmala, Henry Wang, Andrew Miller, Dawn Song, and Yang Wang. 2023. Unpacking How Decentralized Autonomous Organizations (DAOs) Work in Practice. *arXiv*, April 17, arXiv:2304.09822.

Shilina, Sasha. 2022. *A Comprehensive Study on Non-Fungible Tokens (NFTs): Use Cases, Ecosystem, Benefits & Challenges*, May. Moscow: Lomonosov Moscow State University. [CrossRef]

Sims, Alexandra. 2020. Blockchain and Decentralised Autonomous Organisations (DAOs): The Evolution of Companies. *New Zealand Universities Law Review* 28: 423–58. [CrossRef]
Smith, Sean Stein. 2022. Cryptocurrency-funded groups called DAOs are becoming charities—here are some issues to watch. *The Conversation*, February 4. Available online: https://theconversation.com/cryptocurrency-funded-groups-called-daos-are-becoming-charities-here-are-some-issues-to-watch-174763 (accessed on 5 February 2023).
Sotheby's. 2023. Natively Digital: A Curated NFT Sale. Available online: https://www.sothebys.com/en/digital-catalogues/natively-digital-a-curated-nft-sale (accessed on 28 May 2023).
South South Art. 2023. Online Art Community: Global South Contemporary Art. Available online: https://south-south.art/ (accessed on 13 August 2023).
Stackpole, Thomas. 2022. 'What is Web3?' Your guide to (what could be) the future of the internet. *Harvard Business Review*, May 10. Available online: https://hbr.org/2022/05/what-is-web3 (accessed on 5 February 2023).
Stanescu, Alexandru, and Tudor Velea. 2023. The emergence of DAOs: From the legal structuring to dispute resolution. *Global Legal Insights*. Available online: https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/17-the-emergence-of-daos-from-legal-structuring-to-dispute-resolution (accessed on 3 August 2023).
Stublic, Helena, Matea Bilogrivic, and Goran Zlodi. 2023. Blockchain and NFTs in the Cultural Heritage Domain: A Review of Current Research Topics. *Heritage* 6: 3801–19. [CrossRef]
SuperRare® Labs. 2023. Terms of Service, version 4.1. April 5. Available online: https://campaigns.superrare.com/terms (accessed on 16 April 2023).
Takac, Balasz. 2022. The Art World Responds to the Russian Invasion of Ukraine by Wide Walls. *Artist at Risk*, April 13. Available online: https://artistsatrisk.org/2022/04/13/press-the-art-world-responds-to-the-russian-invasion-of-ukraine-by-wide-walls/?lang=en (accessed on 25 February 2023).
Troncoso, Stacco. 2019. The Open Coop Governance Model in Guerrilla Translation: An Overview. In *Decentralized Thriving: Governance and Community on the Web 3.0*. Edited by Felipe Duarte. DAOSTACK.IO. pp. 100–17. Available online: https://daostack.io/ebook/decentralized_thriving.pdf (accessed on 19 February 2023).
United Kingdom HM Treasury. 2023. *Future Financial Services Regulatory Regime for Cryptoassets: Consultation and Call for Evidence*; February. London: HM Treasury. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133404/TR_Privacy_edits_Future_financial_services_regulatory_regime_for_cryptoassets_vP.pdf (accessed on 19 March 2023).
United Kingdom Parliament. 2022. Non-fungible tokens (NFTs) and the blockchain. Written evidence submitted by Sorare. *DCMS Select Committee*. Available online: https://committees.parliament.uk/writtenevidence/114732/pdf/ (accessed on 12 February 2023).
Van Rees, C. J. 1983. How a literary work becomes a masterpiece: On the threefold selection practised by literary criticism. *Poetics* 12: 397–417. Available online: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwi_5NjB5biBAxUIg1wKHQjyCy0QFnoECBcQAQ&url=https%3A%2F%2Fwww.sciencedirect.com%2Fscience%2Farticle%2Fpii%2F0304422X83900153%2Fpdf%3Fmd5%3D3c8035514478ceeccc9af1170b548 (accessed on 5 February 2023).
Vasan, Kishore, Milan Yanosov, and Albert-Laszlo Barabasi. 2022. Quantifying NFT-driven networks in crypto art. *Scientific Reports* 12: 2769. [CrossRef]
Veitch, Mara. 2023. Could 2023 be the Year of the DAO? *Cultured*, January 12. Available online: https://www.culturedmag.com/article/2023/06/02/vincent-van-duysen-zara-home-collection (accessed on 22 February 2023).
Velthuis, Olav. 2005. *Talking Prices: Symbolic Meanings of Prices on the Market for Contemporary Art*. Princeton: Princeton University Press. [CrossRef]
Weill, Federico. 2023. Empowering Web3: The Rise of Decentralized Governance and DAOs. *LinkedIn Pulse*, April 11. Available online: https://www.linkedin.com/pulse/empowering-web3-rise-decentralized-governance-daos-federico-weill (accessed on 4 August 2023).
Weinstein, Gail, Steven Lofchie, and Jason Schwartz. 2022. A primer on DAOs. *Harvard Law School Forum on Corporate Governance*, September 17. Available online: https://corpgov.law.harvard.edu/2022/09/17/a-primer-on-daos/ (accessed on 15 February 2023).
Wieder, Bernadine Brocker. 2023. Discover Acrual's Pioneering Blockchain Technology. *ArtReview*, March 17. Available online: https://artreview.com/discover-arcuals-pioneering-blockchain-technology/ (accessed on 26 March 2023).
World Economic Forum and Wharton School, University of Pennsylvania. 2022. Decentralized Autonomous Organizations: Beyond the Hype. In *White Paper*. Geneva: World Economic Forum (WEF), June, Available online: https://www3.weforum.org/docs/WEF_Decentralized_Autonomous_Organizations_Beyond_the_Hype_2022.pdf (accessed on 12 February 2023).
World Economic Forum and Wharton School, University of Pennsylvania. 2023. *Decentralized Autonomous Organizations Toolkit: Insight Report*. Geneva: World Economic Forum (WEF), January, Available online: https://www3.weforum.org/docs/WEF_Decentralized_Autonomous_Organization_Toolkit_2023.pdf (accessed on 2 August 2023).
Yanger, Zack, and Noah Davis. 2021. All About NFTs—SuperRare's Zack Yanger and Christie's Head of NFTs Noah Davis. *Art Sense by Canvia*. Episode 12. September 14. Available online: https://kite.link/Art-Sense-Episode-12?utm_source=embed&utm_medium=webplayer (accessed on 15 February 2023).

Zhang, Hedy. 2022. *What Are the Potential Uses and Things to Consider for NFTs in the Arts Museum Field?* Pittsburgh: Carnegie Mellon University, May 6, Available online: https://courses.ideate.cmu.edu/62-830/s2022/?p=1579 (accessed on 26 March 2023).
Zhen. 2023. Revolutionizing Art with Web3—Art Group's Journey Empowered by IOST. *Medium*. IOST in Hong Kong. July 7. Available online: https://medium.com/iost/iost-in-hong-kong-revolutionizing-art-with-web3-art-groups-journey-empowered-by-iost-f79fd0674ea7 (accessed on 4 August 2023).