

# The Art Market 2.0

## Blockchain and Financialisation in Visual Arts

Duncan MacDonald-Korth  
Vili Lehdonvirta  
Eric T. Meyer

University of Oxford  
and  
The Alan Turing Institute



Cover image:

Simon Denny

Blockchain Visionaries [with Linda Kantchev]

Installation View, Berlin Biennale 2016

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## **Executive summary**

**This report examines the potential impacts of blockchain technologies on the art market.**

**Using a primarily interview-based approach with sector experts, the report analyses how and in what specific areas blockchain technologies could be used to change the composition of the art market, including the method of sale, record of provenance, and transparency of ownership.**

**It also considers how blockchain technologies may change the balance of economic power in the art market, integrate art into the financial sector, and whether the art industry is likely to grow more or less consolidated as blockchain and/or other digital technologies are introduced.**

**Finally, the report proposes the creation of a new fair trading standard for the art market, and argues that London will need to fight to maintain its dominant position in the art market.**

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## Key findings

- “Blockchain” is more than a technology: it is a discourse that unites and divides, and holds great meaning for all those involved.
- Blockchain is not as far along in its development as many expect, with one leading technologist comparing it to the internet in 1993.
- Blockchain is a concept that is pushing organisations and individuals to compete and collaborate to hash out a new digital future.
- The economic stakes involved in the introduction of digital ledger technologies into the art market are very high.
- Digital ledgers could help with not only the trading of art, but also provenance tracking and tax collection related to art transactions.
- The conflicts of interest which plague the art market will not be solved by technology, but technology can offer an infrastructure to ease them.
- Art market liquidity and value are likely to soar if digital ledger technologies are successfully introduced, creating new side industries, such as a boom in art-based lending, and making art an integral part of the financial industry.
- Such financialisation of the art market holds significant promise for artists if correctly governed, but also comes with risks.
- A single large company seems likely to dominate the art market as technologies are introduced.
- The UK is likely to lose out on tax and royalties if it does not work hard to adopt digital art technologies.
- The art market and the UK can set a standard for the adoption of digital technologies across the economy.

# Introduction

**“As important as the internet itself” is how one of our most esteemed technological interviewees described blockchain. The comment captures well the uproar surrounding the poorly understood yet sensationally hyped technology. The technology, which fits into a group broadly referred to as “digital ledger technologies”, is as hard to define as it is easy to proselytise. In its most simple form, blockchain refers to a shared digital ledger, but such a summary hardly does justice to the range of uses, or better, the range of promised uses, for what at present appears among the most celebrated emerging technologies.**

The sheer volume of media coverage and industry reports are a testament to both the technology’s promise, but also its power to manifest both hope and greed in industry and society. One of the most interesting aspects of blockchain is how it is imagined and presented by such diverse groups with varying goals and beliefs. Blockchain is the technology of the future for both the staunchest capitalists as well as those hoping for a utopian future of information sharing and the end of big business dominating the use of personal data. How could a single technology fulfil the hopes of such seemingly irreconcilable visions? One set of possible scenarios would see distributed ledger technologies develop into a generative platform comparable to the internet, which supports both the flow and the control of information, although the balance between these are the source of ongoing tensions among stakeholders.

Because of the hype surrounding blockchain, it has been covered extensively in the media and by industry experts. What more is there to add? The answer is quite a bit, especially in specific areas which will have substantial impacts for stakeholders. The report will focus on the implications for blockchain on the art market. This is one of the least-discussed applications for blockchain, yet one where the technology may hit hardest. Our research has shown us that despite art frequently being seen as a niche, standalone sector, the battle over blockchain and the way in which it is implemented here may have extensive implications for its adoption across the rest of the the economy.

Looking at the art market, it is hard to miss blockchain's potential. Art is currently plagued by fraud, illicit business, and tax evasion, all products of a fragmented physical market that is hard to follow. Enter blockchain, which on the surface appears a silver bullet. In one shot, blockchain could ensure the veracity of an art piece, make the price and parties to a sale transparent, and allow oversight to monitor the flow of art assets in and out of different tax jurisdictions. But surely it won't be this easy, especially given how high the stakes. The total volume of annual art transactions is over \$70bn year and growing, and that is just what is visible.<sup>1</sup>

The level of transparency provided by blockchain is what artists and regulators want, but will buyers, sellers, and the agents who represent them block such a development? Our research shows that all sides may be able to achieve their goals, and in doing so, set a model for how blockchain and the digital economy may evolve.

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1 Kinsella, I. (2016). *TEFAF 2016 Art market report- artnet News*. [online] artnet News. Available at: <https://news.artnet.com/market/tefaf-2016-art-market-report-443615> [Accessed 3 May 2018].

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## Our goal

The research for this report was done in two parts. One part consisted of five months of desk-based research of media, industry, and interview data to get a firm grounding not only in blockchain technologies, but also in the art market, financial markets, and the areas where digital ledger technologies may be relevant. We then held 26 interviews with professionals across the art and technology space to get their views on where art and blockchain may be headed.

The goal for this report is to give those interested in blockchain, art and/or finance a view of how the former may be introduced into the latter, and how the latter may influence the former. Art has long been known to influence society, and we believe there is a high degree of likelihood it will do the same with blockchain. Art and the blockchain are currently at the very beginning of what is likely to be a long and intricate dance towards integration, and one which will shape much beyond both.

By the end of the report, we hope readers will understand much more about the intersection of blockchain, art, and finance, but perhaps more importantly, the key economic battles that are being waged surrounding the adoption of new technologies across the economy. Yet such an understanding does not come easily, so we will first start with some basics about blockchain to help cut through all of the hype.



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# What is blockchain? Technology vs idea

Distributed systems are information systems consisting of a network of computers passing messages between each other to achieve a common goal. The first distributed systems were created in the 1960s and today they are widely used in telecommunications, business, and everyday life. Mundane examples of distributed systems include telephone networks and email.

The term blockchain has gained currency in recent years as the name for a particular type of distributed system, popularised by the cryptocurrency Bitcoin. In technical terms, a blockchain is simply an append-only data structure, consisting of a chain of data blocks linked together by cryptographic hashes. Such chains were first developed in the 1990s as a data integrity technology, to prevent the tampering of records held by an organisation. They were used for this purpose long before Bitcoin gained prominence.

Bitcoin's novel innovation is the so-called "proof-of-work" algorithm. Proof-of-work makes it possible for a chain of data blocks to be maintained on an open network that any computer can join, without compromising the integrity of the data. Bitcoin thus turns blockchain into a particular type of distributed system. Blockchain systems in this post-Bitcoin sense are predominantly cryptocurrencies (also known as cryptotokens) and platforms for executing "smart contracts" that move around cryptocurrencies or cryptotokens according to some rule. The technology has some attractive characteristics for financial applications: an append-only log is a good data structure for implementing a ledger of transactions. Moreover, the proof-of-work algorithm relies on the system being able to offer a financial incentive for participants to verify transactions.

For a number of years now, revolutionary applications for blockchains have been proposed in a wide range of areas other than cryptocurrencies, such as securities markets, supply chain management, digital identity, and also the arts market. From a technical standpoint, these expectations placed on blockchain are frequently overblown. Proof-of-work blockchain systems such as they exist today do not provide anywhere near the latency, throughput, storage, or security required of many of the envisaged applications. Further development is likely to relax some of the constraints, but not all. Bitcoin-style blockchain might simply not be the right distributed systems architecture for an ultra-low-latency, ultra-high-throughput domain like securities trading.

In the narrower sense of an append-only data structure, without the open distributed system aspect, it is easier to see blockchain as a useful component for enhancing data integrity in many kinds of application areas. However, blockchain in this sense has been around for almost two decades, so why would it kick off a revolution now? As Princeton computer science professor Arvind Narayanan has noted, a “permissioned blockchain” is simply another name for a shared database.

Our approach to understanding the present situation is to view “blockchain” not so much as a technology with specific attributes, but as a novel narrative or idea of how economic activities could be reorganised with the help of technology. From this perspective, blockchain’s potential is not so much in its technical attributes, but in how it has emboldened people across industries to reconsider how such an industry might be structured and organised. “Blockchain” has become code for using the power of digital technologies to make processes faster and more efficient, but in a way that does not result in the digital identities of people or objects falling under the control and ownership of an unaccountable gatekeeper. In this age of digital monopolies, “blockchain” has become a cry for “digital, but open and inclusive as well.”

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The method of this report is therefore ethnographic. This means that our aim is not to interrogate stakeholders' views on blockchain against technical realities, but to treat them as evidence of the hopes and fears that stakeholders attach to technology. Our analysis produces a diagnosis of the problems and bottlenecks, and an outline of how technologies might be used to restructure and reorganise art markets and finance in a way that addresses these problems. What is important is how technology can be used to alter not only efficiencies but also power relations in a field. Whether the eventual solutions are implemented with what technologists would define as "blockchain" or some other distributed system architecture is less important in comparison.

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## Where is blockchain now?

Blockchain as a technology is not nearly as far along as it is as a narrative. While the potential of blockchain to revolutionise various industries—payments, securities clearing, tax payments, identity security etc.—has been discussed for years, delivering on that potential is still a long way off. In fact, all the hype surrounding the technology has already led some to call it a “bust”.<sup>2</sup> According to one well-regarded blockchain industry specialist we interviewed, on a development timeline, blockchain is only where the internet was in 1993. To put that in perspective, 1993 was half a decade before the “Dot Com” stock market boom in tech companies, four years before Amazon became publicly traded, and well over a decade before Facebook was founded or the internet began to have a major impact on ecommerce. If this observation is accurate, it suggests that blockchain is still very much at a nascent stage of development. For all the forecasts about blockchain’s coming transformations of a variety of sectors, there are still many years of development in store before blockchain could become a mature and broadly applied technology. The longer the development timeline, the more its development trajectory may veer away from current conceptualisations.

According to leading blockchain technologists, there are two major challenges that currently need to be overcome before blockchain can even begin to match any of the excitement which surrounds it. One is well-known, but needs to be stated nonetheless; the other is poorly understood. The first issue, which we have already briefly mentioned is centred on transaction throughput, or the volume of transactions which blockchain can process in a given timeframe. For instance, the Bitcoin blockchain can only process about seven transactions per second and is very energy intensive. Compare this to Visa’s processing network, which can handle 56,000 transactions per second (without the use of

2 Kaminska, I. (2017). *Taking the block out of blockchain...* [online] Financial Times. Available at: <https://ftalphaville.ft.com/2017/11/22/2196054/taking-the-block-out-of-blockchain/> [Accessed 5 Apr. 2018].

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blockchain technology).<sup>3</sup> Even non-technologists can see that such an infrastructure is woefully inadequate for scaling at the industrial level. Therefore, before blockchain can take any major leaps forward to revolutionary, or even commercial applications, this hurdle will need to be overcome.

The second issue is less discussed and much more poorly understood. This problem is the interoperability of blockchains, or lack thereof. There are now countless blockchain systems in operation, with each being designed for a specific purpose, some by a community and some by a corporate entity that is building it for a particular need. However, an important part of the promise of blockchain technology has always been the way it connects multiples users and creates a sum greater than its parts. At the current state of blockchain technologies, such broader connectivity is lacking. Often because of competitive concerns, companies are building discrete ledgers which compete for particular market niches. The issue with this is that in order for a blockchain to be truly revolutionary, it needs to be widely adopted in a highly connected way. The best example of this is a remarkable distributed system that many of us use every day—email. While being over 40 years old now, email has many similarities with blockchain, mostly in how the two both connect groups through time and space. Email was initially popularised because of its uses for intra-company communication, but was then expanded to provide inter-company and inter-person communication from any location on any computer. This was not an organic process: it took concerted collaboration to develop a single email protocol that was adopted by all the email service providers we know today. Blockchain is at the very beginning of the same process. Companies are building internal digital ledger systems, but there needs to be a great deal of work done on interoperability before the technology can fulfil the promise that many envision.

Some companies are working to make interoperability a reality, such as BigChainDB. Based in Germany, the company's focus is on developing a standard protocol so that different blockchains built for similar, or even different, purposes could speak to each other. As an example for the need for such technologies, consider ticket booking sites. For an event at the O2 arena in London, the owner of the arena may give

3 Visa.com. (2018). Visa. [online] Available at: <https://usa.visa.com/dam/VCOM/download/corporate/media/visa-fact-sheet-Jun2015.pdf> [Accessed 10 Apr. 2018].

rights to ten different ticket booking companies to sell tickets. Each of these companies may have their own blockchain for payment and booking, yet if all the systems are not all interoperable, there is no way for the O2 arena to know how many of the tickets they have given to each have been sold, and the whole event could be overbooked. Similar examples abound all across the economy, such as in financial markets, tax collection, the travel industry, and beyond. The point is, digital ledgers will need to be more interoperable before the technology becomes broadly useful.

Thus, blockchain itself still has two major hurdles to overcome. In our opinion, the interoperability challenge will be more difficult to solve. Transaction throughput is a technical problem, one that can be addressed with an architecture different from a Bitcoin-style proof-of-work blockchain. But interoperability is a collaborative problem that will take cooperation to solve. This may run counter to the interests of many for-profit businesses, so various industries will need to find ways to work together to overcome this problem. Many intra-industry efforts have begun, perhaps the most notable among them being the R3 partnership of large financial institutions, who are seeking to have an independent, but mutually funded, entity develop protocols which all can adopt.

## **Blockchain: trust and governance**

One of the most important factors behind blockchain's momentum as an idea or narrative is the notion of trust. Surveying media and trade publications and speaking to those involved in blockchain, and those considering using it, by far the most attractive component of the technology is the way in which it creates trust in the transaction record of whatever is recorded, whether that be financial transactions, product locations, or ownership. By distributing the inputs and verification of data to multiple disparate parties, distributed ledger technologies can create a referenceable and tamper-proof record on which all parties can rely. This crucial aspect of the technology is no different in the art world.

Perhaps even more than in other industries, trust is fundamental to the art market. Even casual observers will be familiar with the huge potential risks of fraud in the art market, and it is in this area where blockchain holds a great deal of promise. There are two critical considerations in any art transaction: is the piece what it proclaims to be, and, does the person selling the piece own it (or have the right to sell it). These are the two major risks in any transaction, and distributed ledgers hold the potential to greatly alleviate both of them. Distributed ledgers could be used to both track the ownership history of a given piece, and prove the provenance of the piece simultaneously. For instance, physical identification tags (e.g. RFID tags) can be affixed to a work of art, which allow it to be scanned any time it is transported or transacted, keeping a permanent record of its whereabouts and ownership. New works could be registered on the blockchain as soon as they are created, while existing works could be verified as authentic once they are approved by verification specialists. Ownership could be recorded and updated each time the work changes hands. On the surface, this sounds like a silver bullet to many of the problems that plague the art market. Yet, when one digs deeper, it becomes clear just how vulnerable blockchain, and its promise of trust, are to the reality of competing interests.

While the majority of art owners conduct business through legal and reputable channels, the art market is currently rife with illicit business. All too often owners of art works, even, or especially, at the higher end,

use such assets to launder money, or at least as a value store that is beyond the scope of regulatory bodies. Additionally, such works are often traded completely discreetly and without tax. For such individuals, the lack of transparency in the art market is of critical importance. Accordingly, the companies which service this high-end clientele also greatly value the discreet and opaque nature of the market. Therefore, there are major vested interests to keep the art market opaque and stop it from adopting blockchain, or perhaps more likely, vested interests which will shape its uptake. In particular companies and individuals will have the incentive to create closed, or “private”, blockchains which only allow access to certain parties, or have technology embedded within them which favour one group or another (e.g. certain transactions not being approved unless they have the consent of certain members of the chain). If you take a step back and look at the interests of the other side of the transaction—the artists themselves, their interest is to know who owns their work and at what price it is trading. In some jurisdictions, most notably the UK, artists are legally entitled to a royalty, called Artist’s Resale Right, on subsequent transactions. So as much as owners may want opacity, including for completely legitimate reasons such as not broadcasting that they have an expensive piece of artwork hanging on their wall, artists themselves desire greater transparency. In this way, the trust aspect of any art sector blockchain is at once both crucial and vulnerable. This leads to a wider question about the creation and maintenance of blockchains and the politics embedded within them, a question of governance.

Such a question is not unique to the art market by any means. As an example of this, consider the agricultural commodities markets for foods consumers buy everyday. UK residents in particular will remember the Tesco horse meat scandal of 2013,<sup>4</sup> an event which shined a light on the need for transparency in the food supply business in order to ensure safety. Companies such as IBM are now attempting to use blockchains to help ensure the safety of crops and of the public’s food supply.<sup>5</sup> In the most basic example, RFID tags are attached to containers of vegetables, tomatoes for example, and that carton of tomatoes is tracked from the field, through shipping, and finally into stores. However, just as in art, there are many competing interests, and faith in the system is key. For instance, as much as regulators and consumers want food safety

4 Lawrence, F. (2013). *Horsemeat scandal: where did the 29% horse in your Tesco burger come from?*. [online] the Guardian. Available at: <https://www.theguardian.com/uk-news/2013/oct/22/horsemeat-scandal-guardian-investigation-public-secrecy> [Accessed 1 Apr. 2018].

5 Wilson, M. (2017). *Retailers and producers turn to IBM Blockchain to improve food safety*. [online] Cloud computing news. Available at: <https://www.ibm.com/blogs/cloud-computing/2017/08/24/blockchain-food-safety/> [Accessed 4 Mar. 2018].



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and transparency, retailers may not be ready to share details of their suppliers. Further, an unethical farmer has an incentive to grow crops in the cheapest way possible, but then say they are something else; for instance, growing conventional tomatoes but selling them as organic/bio tomatoes to earn a higher price. Or perhaps even more simply, switching the RFID tags between two cartons. The exact same could be done with pieces of art.

The point of this discussion is to understand that blockchain technology is seen to hold great promise largely because of the trust that its fundamental design is seen to instil. Yet, the very implementation of that design is subject to so many competing interests that the realisation of the technology may ultimately undermine its very utility. Accordingly, the way all sectors navigate this challenge will be critical to the adoption and success of distributed ledger technologies.

Furthermore, even if various industries can collaborate and overcome bias to develop broadly utilised blockchain protocols, there is still another major risk related to trust—that of consumers themselves. Over the last few years, there has been a burgeoning fear of data misuse and a significant decline in the public's trust of the corporate use of data. Therefore, not only will companies need to work out their own differences, but the way data is stored and used will have to be implicitly approved by the public, and by extension, by regulators, before distributed ledgers can be a success.

In our view, efforts on this front are not off to a very strong start and the recently dominant utopian view of blockchain is fading very quickly. Our research revealed that the term blockchain itself is being used in a false way, as many "blockchain companies" are really nothing of the sort. Because of the hype surrounding the technology, many companies use the term as a sales tool to bring in business, but never use actual blockchain technology for their clients. Several companies have even added blockchain to their names in an effort to boost their stock price, many times to great success.<sup>6</sup> This kind of bad behaviour is already undermining trust in the technology aside from the competing interests, which lay at its heart.

6 Cheng, E. (2017). *\$24 million iced tea company says it's pivoting to the blockchain, and its stock jumps 200%*. [online] CNBC. Available at: <https://www.cnbc.com/2017/12/21/long-island-iced-tea-micro-cap-adds-blockchain-to-name-and-stock-soars.html> [Accessed 7 May 2018].

## **Art and the blockchain: two competing visions**

One of the most interesting parts of our research concerned how artists, practitioners, and those involved with the art market more broadly, thought and felt about blockchain. The word “felt” is not used casually, as how this group “felt” about art and blockchain is as important as what they thought about it. From 26 broad conversations about art and blockchain, the most common situation was a mixture of hope and fear in equal balance. In particular, there are two competing visions emerging for how art and the blockchain may ultimately integrate.

First, the “hope”. The hope of most artists is that adoption of distributed ledger technologies in the sector would lead to a more balanced, transparent, and equitable market for all. In particular, the artists we spoke to hope that blockchain will help them better monitor what their art is worth and collect money which is due to them. More broadly, many hope blockchain will allow young artists to make a more sustainable living by giving them a better platform through which to sell their art. These hopes, especially in the context of the reality of the 21st century art market, can be described as nothing less than utopian given the art world’s opacity and domination by a thin upper crust to whom the vast bulk of rewards flow. Interestingly, artists fully understand just how utopian a dream their view is, but still hold on to it as they deeply hope for it to be a reality. There is an emotional connection to this version of a future reality. That hope is a half of their “feeling” about blockchain.

The other competing view is as dystopian as the first is utopian. That view is that “blockchain” will come to be applied to the art market by a single entity which will come to extract even more severe economic rents from artists, leaving them disenfranchised. In such a scenario, this single entity is a large social media company, which is presumed to have developed a prominent art-focused “blockchain” to monitor, sell, and track physical and digital artworks. This need not be an actual blockchain in the technical sense; in reality it would likely be implemented with a more conventional information system, but with the term blockchain, stakeholders invoke the general idea of a comprehensive digital record that tracks art works.

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The market for digital art is more technologically challenging than for physical art for two key reasons, both of which make it more susceptible to the market being dominated by a large tech company. The first is that in a digital art work you cannot simply attach an RFID tag to scan, so one needs to develop some sort of digital watermarking to track images, video, or other digital objects. Secondly, digital art pieces are involved in millions of daily “transactions” on social media; a very high-capacity information system would be needed to track all of these, well beyond the capabilities of Bitcoin-style blockchain technology. A large, well-capitalised, and technologically-skilled company is well-positioned to solve these issues, including making a digital ledger scalable enough that transaction costs would be manageable for often very inexpensive digital art works. Further, social media companies are already considered the biggest infringers on artists’ copyright, as their platforms hosts millions of copyrighted images every day without ever paying the copyright holders for them.

Most of the people we interviewed, who are involved in the art sector, believe that the second outcome is more likely than the first, and we agree. Yet the challenge that all realise must be undertaken is to try to create the best outcome possible for artists. However, therein lies another reason that domination by a single entity seems most likely—artists themselves cannot agree on what their interests are.

For instance, one of our interviewees was an artist who produced live interpretive dance performances. She is successful both artistically and in the sense that she makes a living putting on her performances. However, she conceded that she gave away videos of her performances for free online, saying there was no way to monetise doing so. Such practices are commonplace amongst artists. During our conversation we asked her if she would use a blockchain-based service to monetise such digital distribution were it available to her. We fully expected a yes, but instead received a robust “no”. The artist explained that in her mind, universal digital access to her work was an important part of cultural history and should always be accessible for free.

While this is the view of a single artist, it demonstrates the point that artists generally do not see their work as a mere vehicle for profit. Rather, artistic practice is imbued with deep social, ideological, political, and cultural meanings that are a core part of artists’ identities. While many would argue that this is one of the core strengths of art, or perhaps what makes art so unique from most of the rest of the economy, it is a major challenge to overcome when looking at the sector from a purely economic angle. Corporates, such as a large social media company, generally have only one central aim—profit.

This streamlines their thinking and makes their approach simple. For artists, however, the challenge is not only economic, but political, social, even existential. The question then is how to harness these variant concerns—which make art so special—and turn them into an actionable mission. In our view, artists will need collective representation, perhaps more than ever, to bring this mission to life. Collective representation will be crucial to helping shape digital ledger adoption into a direction that works for artists.

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## Distributed ledger, consolidated market

Part of the utopian dream underpinning artists' hopes for blockchain is centred on the distributed nature of the technology. As mentioned, the technology's ability to inspire trust, and for Bitcoin aficionados, freedom, is largely drawn from its distributed nature. Because a blockchain ledger is held and created by many disparate counterparties, in principle it is intended to be protected from ever being dominated by any one entity. If "capitalism is monopoly," as legendary Paypal founder and capitalist Peter Thiel says, then blockchain is somewhat of a socialist or libertarian dream technology, or so it would seem.

Artists currently see the art market as highly consolidated. A fairly small number of top galleries and auction houses take the lion's share of profits, and the total value of the art market is highly weighted towards the very most valuable pieces, such as by old masters or 20th century contemporary collector favourites. Yet, given the history of technology adoption in markets, as well as the indicative direction in which blockchain is moving in the art world, it seems highly likely that digital ledger technologies will actually make the art market more consolidated and top heavy than it currently is. There are two core reasons why we contend this is likely to occur: a winner takes all history in new technologies, and an explosion of value as technology is adopted.

The history of new technology adoption, perhaps especially relevant to the "tech" era since the adoption of the internet in the 1990s, has shown time and again that new technologies often lead to a winner takes all scenario.<sup>7</sup> Social media companies are an oft-cited example of this, as despite being a medium for billions of members, just a handful of social media companies have ever come to prominence. In terms of stock market volume, Facebook and Google alone account for almost

7 Malik, O. (2015). *In Silicon Valley Now, It's Almost Always Winner Takes All* | *The New Yorker*. [online] Newyorker.com. Available at: <https://www.newyorker.com/tech/elements/in-silicon-valley-now-its-almost-always-winner-takes-all> [Accessed 3 Mar. 2018].

20% of the entire US technology sector, which itself constitutes almost a third of the entire US stock market (S&P 500).<sup>8</sup> While this history is an important factor, it cannot be taken in isolation, and we merely see it as a supporting idea to the key storyline, which is that creating a blockchain for both digital and physical artwork will be labour and capital intensive, and perhaps most importantly, intellectual property intensive. That means that a large, skilled, and well-capitalised technology company is most likely to create and patent the technology that will ultimately drive the ledger that powers the art market 2.0. Speaking to technologists in the area, we found blockchain to be highly intellectual property driven, especially related to the development of bespoke systems to power certain applications, such as a marketplace for art transactions, ownership records etc.

If a technology company does manage to patent a new technology, and then use its scale and influence to encourage its adoption, then the market could be dominated by a single player before any real competition ever comes forth. If this occurs, it would give the company strong pricing power and unprecedented oversight into the market, all of which would likely mean it extracts economic rents from the system. All that said, we do not believe this will be a share of a shrinking pie. Rather, we expect the art market to boom in value and economic importance as digital ledgers are adopted.

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8 French, S. (2017). *Understanding ESG Investing* | ETF.com. [online] Etf.com. Available at: <http://www.etf.com/publications/etfr/understanding-esg-investing?nopaging=1> [Accessed 7 Apr. 2018].

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## Art market 2.0

In this section we outline a potential new future for the arts market. This is to be read in part as a research finding and in part as a manifesto that outlines our recommendations for the sector, given the new technological possibilities and stakeholders' diverse interests.

For all the hype so far about the adoption of new technologies for purchasing art, the art market has remained largely unchanged over the last two decades. While the value of art work transacted, especially at the high-end, has exploded, the mode of transaction has remained relatively stagnant, with auction houses and private sales dominating the market. But our research, based on the views of many experts in the space, has led us to conclude that this is likely to change and that the art market is headed for a previously unimagined reality: a world where art needn't change hands to be of huge value, where veracity is assured, and art becomes interwoven into an entirely new sector.

As part of the adoption of digital ledgers in the art market, we envision a world where top art pieces are no longer traded through physical auction houses but are instead traded digitally, just like other assets, all while being held in safe and protected depositories. Art is already frequently held in safe depositories, often called "offshore private vaults", which are climate-controlled and highly protected vaults which protect valuable assets. They are frequently found in offshore locations, or jurisdictions which are beyond the reach of regulators. As a comparison, highly valuable assets like gold are often held in similar depositories, and are traded digitally, with ownership certificates and responsibility for storage fees moving with the same digital fluidity as the transaction itself. Consider the infrastructure of offshore private vaults a necessary precondition to digital trading, and one that is fully in place.

However, the real reason why high value art work is likely to become digitally traded is that unlike in other matters (such as disclosure of ownership), digital art trading is in the interest of every party involved in the transaction, including some who are not yet part of the equation. Let us take a moment to look at all the parties involved in a hypothesised

digital art transaction to understand why such a development seems likely. Let's begin with the artists themselves. As we have already said, what artists want most (economically speaking) is to be able to know how much their art is worth, and be able to collect their royalties on such sales. A digital ledger-powered art market would accomplish this, as it would enable a verified transaction record which makes apparent the price and piece that was sold, allowing a royalty to be collected straightforwardly. Legally speaking, the host of the digital art platform may set up the trading exchange in a jurisdiction outside the scope of where royalties, tax, and VAT are due, but technologically, a digital art market is much closer to the ideal than today's opaque world of physical trading.

Next, let's examine the art buyer. The buyer's main concern is that they are able to transact at a fair market price, that the piece is genuine, and that the seller has a legal claim to be selling it. Digital ledger-based trading would make all of these a reality, as prices could be subject to bidding, RFID tags could ensure the piece is what it purports to be, and digital ownership records would prove the right to sell. This would be a major step forward from the current status quo, where buyers are constantly wary of transacting because of widespread art market fixing and price manipulation.<sup>9 10</sup>

Now onto the seller, who has perhaps the strongest interest of all in a digital market. The primary concerns for a seller are the ability to prove their ownership, prove that the piece is genuine, but most importantly, sell their piece quickly and at the best price possible. For the same reasons as in the case of the buyer, digital ledger-based trading would satisfy all these needs. The last point—the ability to sell quickly—ties into the financial concept of liquidity, defined as the degree to which an asset or security can be quickly bought or sold in the market without affecting the asset's price.<sup>11</sup> The way in which a digital art market would tie many buyers into a single system for purchasing, as opposed to a highly fragmented physical art market distributed over the globe, would mean there would be more buyers and sellers in one place than could ever be achieved in any single physical location. Additionally, hypothetically, all three parties involved in such a transaction would benefit from lower transaction costs—lower shipping, no travel to the

9 Wilson, S. (2016). *The art market turns ugly* - MoneyWeek. [online] MoneyWeek. Available at: <https://moneyweek.com/the-art-market-turns-ugly/> [Accessed 1 May 2018].

10 Kinsella, E. (2018). *Russian Billionaire Dmitry Rybolovlev Continues His Epic Legal Crusade Over the 'Largest Art Fraud in History'* | artnet News. [online] artnet News. Available at: <https://news.artnet.com/art-world/rybolovlev-bouvier-lawsuit-art-fraud-1221968> [Accessed 4 May 2018].

11 Investopedia (2018). What is 'Liquidity'. [online] Available at: <https://www.investopedia.com/terms/l/liquidity.asp> [Accessed 12 Apr. 2018].



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auction house, less hiring of consultants, lower auction fees, etc.

It should now be starting to become apparent why a digital ledger-powered art trading market would be a valuable business to create, and thus why a large company is likely to develop and patent the infrastructure for it. Yet what about the desire for privacy by buyers and sellers? The answer is that a digital trading platform could easily overcome this obstacle. Global equity markets already contain a large element of anonymised trading, taking place in anonymous digital exchanges called “dark pools”.<sup>12</sup> In these digital trading worlds, shares change hands via electronic bidding, and buyers and sellers remain completely anonymous to one another. A digital art trading platform could employ a similar model, and take it a step further by only allowing very limited parties to be part of a private distributed ledger that would power the system. In fact, this technology is already being developed by and should be easily integrated into any forthcoming platform.

For now, let us take the concept of liquidity one step further, as it is a key feature that we have identified which may take art from its own discreet sector into something intimately tied into the global financial-economic engine.

Art-based lending has been around for decades, perhaps centuries, but it has grown substantially since the Financial Crisis of 2008-2009. UBS Wealth Management America, the Swiss wealth manager’s US unit, now makes loans of up to \$150m at a time based on the art held by their clients.<sup>13</sup> Consultancy Deloitte has noticed the trend, commenting about the art market that “a major change over these years has been a shift in the primary focus on art investment toward issues around the management of art-related wealth, including art-secured lending, estate planning, art advisory, and risk management.”<sup>14</sup> The consultancy says that 88% of wealth managers now confirm they see art investing as a critical piece of the overall investing portfolio of their clients.

Arguably an outcome of historically low interest rates and booming equity and bond markets following the Financial Crisis, rich investors poured significant capital into art markets. This sent prices spiking and

12 Sec.gov. (2018). SEC.gov | *Shedding Light on Dark Pools*. [online] Available at: <https://www.sec.gov/news/statement/shedding-light-on-dark-pools.html> [Accessed 7 May 2018].

13 Reuters (2012). More brokers let clients borrow against their Bruegels. [online] Available at: <https://www.reuters.com/article/us-usa-banks-art-loans/more-brokers-let-clients-borrow-against-their-bruegels-idUSBRE87R06520120828> [Accessed 7 Apr. 2018].

14 Vaughn, K. (2017). Inside the Evolution of Art Finance. *Artrepreneur*. [online] Available at: <https://mag.orangenius.com/art-finance/> [Accessed 2 Apr. 2018].

the size of the total art market soaring. Recent art sales have broken records many times, such as the \$450m sale of Leonardo da Vinci's *Salvator Mundi* in late 2017.<sup>15</sup> The total art market is now estimated to be worth \$1.66 tn.<sup>16</sup> With all the price gains many owners of such works wanted to realise some of the gains they had made on appreciation of the art they owned without selling the piece itself. In order to achieve this, large banks, who double as wealth managers (e.g. UBS),<sup>17</sup> began to extend loans to wealthy clients, which were backed by their art portfolios. The transaction is simple: the owner of the work has their art portfolio valued (e.g. \$200m), and asks their wealth manager for a loan of \$50m. The bank agrees, accepts the art as collateral and extends a loan at a fixed interest rate.

Now, while the market for this kind of lending has grown, it has not exploded by any means, and according to experts in the space, the key reason why is that art market valuations are too opaque and unpredictable, and art works are too difficult to sell quickly. In other words, they have poor liquidity. This raises the risk for the lender, as if they need to seize the art work they have secured as collateral, they cannot be assured that they can easily realise the value that had been assessed prior to the transaction. The key to growing art lending, then, is to boost the liquidity of the art market. If lenders could easily sell the art work they count as collateral, then this would increase their margin of safety in the transaction. And not only would higher liquidity make the work easier to sell, but it would make it easier to value, as lenders would have a verifiable transaction history which could help them benchmark value for the various pieces in a portfolio. All of this would allow lenders to offer more competitive interest rates to borrowers.

It is with this increase in liquidity that the art market 2.0 could really take off. Studying the history of increases in liquidity in other asset classes shows numerous examples of how increases in trading efficiency led to collapses in interest rates and explosions in value. As an example, let us consider the US mortgage market in the early 2000s, which is a perfect case study to highlight the snowballing effect of increased liquidity. Beginning in the late 1990s, newly deregulated large American banks began to package all the mortgage loans they were issuing into tradable bonds, called Mortgage Backed Securities.<sup>18</sup> The consumer

15 Christies.com. (2017). *Leonardo's Salvator Mundi makes auction history* | Christie's. [online] Available at: <https://www.christies.com/features/Leonardo-and-Post-War-results-New-York-8729-3.aspx> [Accessed 8 Apr. 2018].

16 Vaughn, K. (2017). Inside the Evolution of Art Finance. *Artrepreneur*. [online] Available at: <https://mag.orangenius.com/art-finance/> [Accessed 2 Apr. 2018].

17 Wealth managers refers to both the individuals and companies who help their clients with matter such as estate planning, investing, legal and tax advice and beyond. See: Prince, R. (2014). <https://www.forbes.com/sites/russalanprince/2014/05/16/what-is-wealth-management/#5191cacd133e>. Forbes. [online] Available at: <https://www.forbes.com/sites/russalanprince/2014/05/16/what-is-wealth-management/#5191cacd133e> [Accessed 2 Apr. 2018].

lending units of these banks, such as Citigroup, JP Morgan, Bank of America, and beyond, would hand over the loans to their investment banking arms, which would package them into bonds with fixed interest rates and then sell them on to investors.<sup>19</sup> The banks would make profit from both a spread between the interest rates they collected and paid out, and from the trading of the bonds themselves. Investors liked the bonds because they provided income from ample yields, and they offered the chance to buy into a new asset class. The more money the banks made packaging and selling the bonds, the more they had their consumer units lend out to home buyers, creating yet more loans to package and sell. As more banks took part, interest rates and lending standards fell, creating a huge supply of loans. As more profit was made, there was yet more buying of the bonds, which in turn pushed prices up, allowing banks and investors to value their loans, and in turn make more. And while this situation got very out of hand, there was no need for it to lead to the crisis which it did. A stronger regulatory regime and more well-developed trading principles could have kept the market in check. Additionally, this is far from the only example of liquidity's effects, as many others abound. For instance, in the late 1990s and early 2000s, many equity brokers were worried that the liquidity created by digital trading would shrink commissions on stock trades and decrease the total size of the market. The exact opposite happened. As commissions fell, trading volumes surged hundreds of percent, which in turn sent equity prices, and total broker profits spiking.<sup>20</sup> The overall point is that liquidity is the lubricant which allows markets to truly explode in size and value.

Returning back to the art market, were liquidity to increase considerably, prices for art would rise and lenders would lower rates, creating more ability for borrowers to profit, in turn making the art market more attractive. This increased appeal would attract yet more buyers, and more lenders, increasing liquidity and lowering interest rates yet further, sending prices for art (mostly at the high end), higher. Liquidity is the key to unlocking the art market, and a distributed ledger-powered art trading platform could provide it.

18 The Economist (2013). Crash course: The origins of the Financial Crisis. [online] Available at: <https://www.economist.com/news/schoolsbrief/21584534-effects-financial-crisis-are-still-being-felt-five-years-article> [Accessed 2 May 2018].

19 The Economist (2013). Crash course: The origins of the Financial Crisis. [online] Available at: <https://www.economist.com/news/schoolsbrief/21584534-effects-financial-crisis-are-still-being-felt-five-years-article> [Accessed 2 May 2018].

20 Staff, I. (2014). *Stocks Then And Now: The 1950s And 1970s*. [online] Investopedia. Available at: <https://www.investopedia.com/articles/stocks/09/stocks-1950s-1970s.asp> [Accessed 1 Mar. 2018].

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## The fair art market

From all of our research and interviews with not only technologists, but also entrepreneurs and financiers, the case just made appears to be the most likely scenario for the introduction of distributed ledger technologies into the art market over the next decade. Our main concerns with future research focus on two key points: the location of the centre of the art market 2.0, and, how can we shape the new market to be fair, well-regulated, and beneficial to all.

In terms of location, our view is that London and New York are likely to compete for being the main centre of the art market 2.0. Both now enjoy considerable advantages in being art centres, with both home to a wealth of not only artists and buyers, but auction houses, galleries and beyond. In our view, however, London is likely to become the predominant centre, but this position should by no means be taken for granted. Its geographic positioning makes it an ideal home for the global art market, as its time zone and well-developed legal and financial markets give it appeal to buyers both to the east and west.<sup>21</sup> London also has some special characteristics which give it an advantage, such as its growing connections with Asian financial markets, as well as its large Shari'ah compliant financial business, both of which will have increased relevance as buyers east of Europe become larger players in the art market.<sup>22</sup> Yet the UK's capital also has some disadvantages, such as a lack of large tech companies, which could develop the underlying technology to power the art trading system. Additionally, the strong legal infrastructure of the UK and EU could work against London as the art market is notoriously good at skirting such locations for more friendly jurisdictions, of which the US is one.<sup>23</sup> As more Asian-based investors continue to enter the art market, leading Asian financial centres, such as Singapore or Shanghai could also easily

21 Wojcik, D. and MacDonald Korth, D. "The Geography of Foreign Exchange Trading: Currencies and International Financial Centres". *Journal of Economic Geography*

22 Wang, A. (2018). *China Aiming for Shanghai-London Trading Link This Year*. [online] Bloomberg.com. Available at: <https://www.bloomberg.com/news/articles/2018-04-11/china-aims-for-shanghai-london-trading-link-this-year-pboc-s-yi> [Accessed 2 Apr. 2018].

23 Wilson, S. (2016). *The art market turns ugly* - MoneyWeek. [online] MoneyWeek. Available at: <https://moneyweek.com/the-art-market-turns-ugly/> [Accessed 1 May 2018].

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wrest away control of the market from its home in London. Beyond just competing for this new market, London also has a chance to influence the way it develops and create a more ethical and beneficial market for all. The UK has already taken a leading position in art market equity through Artist's Resale Right, a forward-thinking policy which entitles artists to a royalty from the resale of their works, and the country now has the chance to take that a step further by developing strong protocols for how the art market 2.0 should operate.<sup>24</sup>

In our view, after extensive research of both the art market and of precedents, we believe the UK should work to push a new standard for equitable art trading, which we call the Fair Art Market. We believe the UK should commission further research into both how the art market 2.0 will develop as well as into creating a body of standards for conduct in the new market which reflect the diverse cultural, political, and economic components of the industry. Such a set of standards would then allow organisations like DACS, as well as the UK's financial industry and high-net-worth individuals, to help adoption of the new standards. The protocol would define the manner in which art should be traded, and would espouse transparency, legality, and equitable benefits to artists. While the idea may sound radical, it has much precedent.

The most prominent example to draw on is both recent and well-established: Environmental, Social, and Governance Investing (ESG Investing). ESG investing is defined as "the consideration of environmental, social and governance factors alongside financial factors in the investment decision-making process".<sup>25</sup> The concept was developed in the early 2000s, but really began to receive traction after 2010. The idea behind ESG investing is that it allows investors to only commit capital to companies that behave in a manner in which they believe. Because of the demand from investors, asset managers began to cater to the market by offering ESG-focused funds. These funds put a "screen" on portfolio selection and only allow companies meeting a rigorous standard (e.g. a certain percentage of women on the board of the company) into the investment portfolio. Adoption of ESG has grown radically, so much so that the concept is now being subsumed into mainstream investing (e.g. for example the growing discourse on

24 Gov.uk. (2014). *Artist's Resale Right*. [online] Available at: <https://www.gov.uk/guidance/artists-resale-right> [Accessed 4 Apr. 2018].

25 Msci.com. (2018). *ESG Investing - MSCI*. [online] Available at: <https://www.msci.com/esg-investing> [Accessed 6 Apr. 2018].

eliminating arms manufacturers from the majority of investor portfolios in the industry). Total assets under management for ESG portfolios in the US alone now top \$8.1 tn,<sup>26</sup> while globally it is over \$22 tn.<sup>27</sup> Needless to say, ESG's ethical focus on investing has been a major success.

We believe the exact same principle should be established in the art market, both to direct the future of the sector, but also to influence the here and now for the better. We contend that the UK government needs to invest in securing London's future as the home of the art market, and in doing so, develop strong conduct standards which reflect its society's values. Doing so would also help preserve the country's economic future in changing geopolitical times. The implications of this effort will not be limited to the art market either, as the precedent set by the manner in which art adopts distributed ledger technologies will set a standard for adoption across the globe, allowing the UK to set a global benchmark for the digital economy which resonates the world over.

26 French, S. (2017). *Understanding ESG Investing* | *ETF.com*. [online] Etf.com. Available at: <http://www.etf.com/publications/etfr/understanding-esg-investing?nopaging=1> [Accessed 7 Apr. 2018].

27 White, A. (2017). *McKinsey: ESG No Longer Niche as Assets Soar Globally*. [online] Institutional Investor. Available at: <https://www.institutionalinvestor.com/article/b15cc1dxds8k97/mckinsey-esg-no-longer-niche-as-assets-soar-globally> [Accessed 18 Apr. 2018].

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# Conclusion

Blockchain is a type of information system architecture popularised by the cryptocurrency Bitcoin. It has some unique features that make it an attractive architecture for building digital currencies. Whether it is as pivotal a technology in other application areas as some enthusiasts believe is doubtful. But our research suggests that blockchain today is more a narrative than any specific technology. It has sparked the imaginations of people across sectors to consider how digital technologies more generally could be used to create shared ledgers tracking the flow of goods and assets, allowing those sectors to be organised differently from today. In this way, blockchain is causing a great many changes to the digital economy, but those changes may not actually occur on any blockchain. Such technological change is likely to also be applied to the world of visual arts. In this report we examined the opportunities, incentives, winners, and potential losers from a reorganising of the £1.66 tn arts market around distributed ledgers. We showed how distributed ledgers, or technologies spurred on by them, would support a financialisation of the arts market, leading to an explosion in liquidity and value, and we proposed a way forward based on the notion of a Fair Art Market that recognises not only the economic but also the social and cultural value of visual arts.

This report has attempted to explain the potential of blockchain technology to transform the art market, but we believe art also has the potential to transform blockchain. Blockchain technologies are part of a broader digital transformation of the economy and society that is being contested on all fronts and has nearly no ground rules. Calls for regulation of technology companies have grown ever louder as more and more cases of abuse and data theft are revealed. Amidst the whirlwind, blockchain has been identified as a potential saviour given a structure that seems to promote trust through its very design. Yet, as we have seen, blockchain, just like any other technology, is not neutral, but has politics embedded within every line of code. Now, as digital technologies are pushed into the art market, the sector has a chance to set a new standard for conduct in the evolving digital economy.

This research constitutes merely a starting point on the path towards understanding the intersection of digital ledger technologies and art. We believe the art world has a profound opportunity to use its established cultural capital, much of it anchored in London, to create a set of standards for how art should be traded and regulated, a model which we believe could serve as a template for wider adoption across different industries as each continues to transition towards a digital economy. Yet this will not happen on its own, as it will take a dynamic mix of investment, artists, technologists, and entrepreneurs to achieve. We hope this report serves as a call to unite those groups into a consolidated effort.



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## About this report

**This report is the product of nearly a year’s research conducted by academics at The Alan Turing Institute and the University of Oxford. We would cordially like to thank our funders DACS and The Alan Turing Institute for their support.**

The report is the outcome of 26 interviews with experts across the professional spectrum, all keenly involved with art, finance, and blockchain in some way, as well as five months of desk-based research. Interviews were conducted both in person and over the phone, and included technologists, artists, financiers, patrons, and academics, the majority of whom were based in London.

The aim of our work is to allow artists, practitioners, lawmakers, business people, and patrons a better understanding of both the present state of the art market and how it could be challenged and shaped by blockchain technologies, as well as how the future of blockchain will be shaped by art.

**About The Alan Turing Institute**

The Alan Turing Institute is the UK's national institute for data science and artificial intelligence. The Institute is named in honour of Alan Turing, whose pioneering work in theoretical and applied mathematics, engineering and computing is considered to have laid the foundations for modern-day data science and artificial intelligence. The Institute's goals are to undertake world-class research in data science and artificial intelligence, apply its research to real-world problems, driving economic impact and societal good, lead the training of a new generation of scientists, and shape the public conversation around data.

**About DACS**

Established by artists for artists, DACS is the UK's leading not-for-profit organisation for visual artists' rights management, collecting and distributing royalties to artists and their estates through Payback, Artist's Resale Right, Copyright Licensing and Artimage. DACS acts as trusted broker for 100,000 artists worldwide, and campaigns for artists' rights, championing their sustained and vital contribution to the creative economy. Founded in 1984, DACS has paid over £100 million in royalties to artists and their estates – a significant source of income supporting artists' livelihoods, their practice and legacy.



