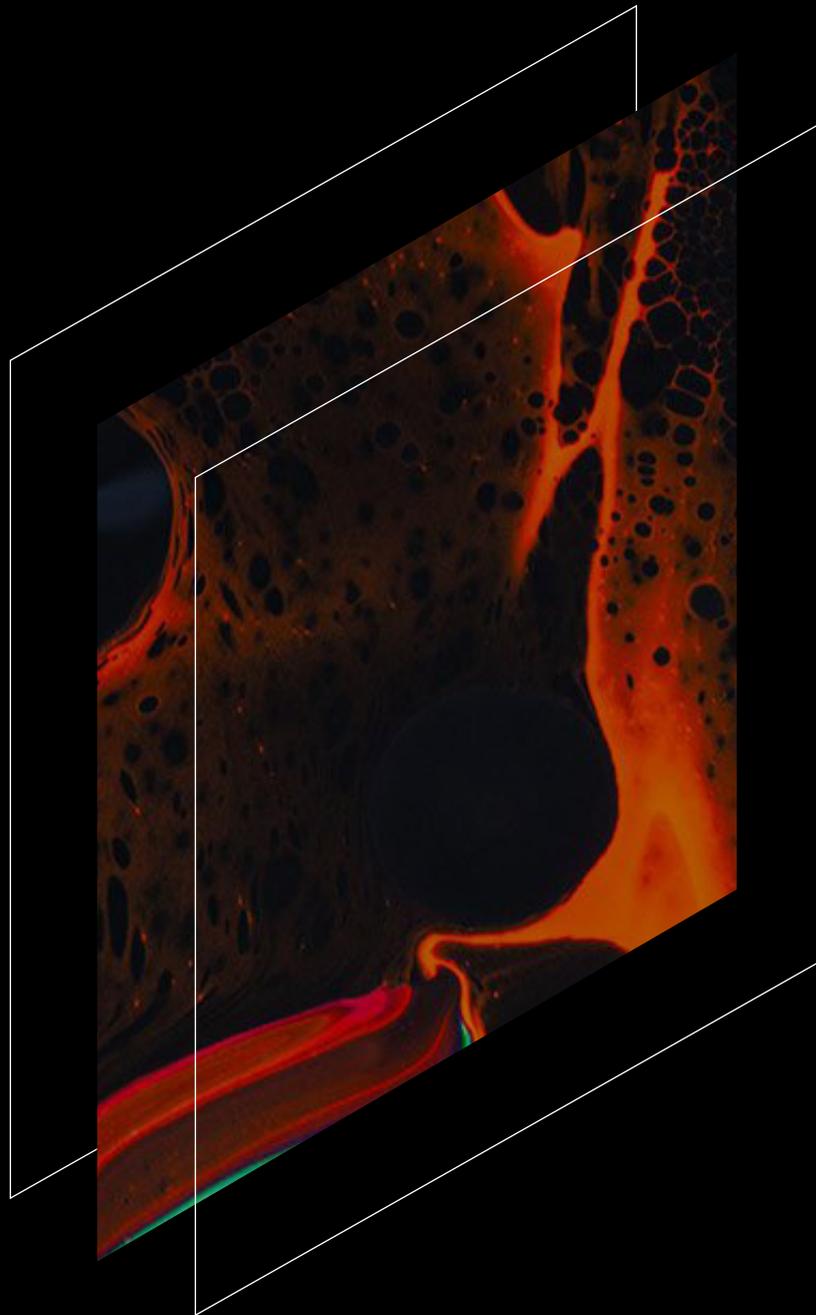


bc/a



The Blockchain Solution For The Established Art Industry

White Paper
January 21, 2021

BCA WHITE PAPER

BLOCKCHAIN.ART | BCA

The Blockchain Solution For The Established Art Industry

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Executive Summary

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Executive Summary

The art world is a global ecosystem of networked actors — artists, galleries, collectors, auction houses, museum professionals, etc. — and an international marketplace that achieved \$67.4 billion in revenue in 2018¹. Art is marketed through multichannel efforts that include traditional exhibitions, pop-up art fairs, auctions, both in-person and online sales, and strategic partnerships. However, since the Covid-19 pandemic began in early 2020, the art world's priorities have shifted dramatically. Now, everything is online — an industry-wide digitization is underway and moving fast.

During Covid-19, online sales accounted for 37% of gallery sales (compared to 10% in 2019), essentially replacing in-person art fair revenue, which many galleries had previously reported had contributed 40% of their annual sales². According to the 2020 UBS Art Basel Art Market report, “Millennials now make up nearly half (49%) of all collectors globally,” and “92% of millennials have reported buying art online.”³ This data point represents a major digital shift across the art market.

Artists create work that reflects the society in which they live, so the art of today is also increasingly digital in nature. Time-based media — such as video art — as well as new media art forms like VR & AR are becoming more and more prominent as multidisciplinary artists experiment with emerging mediums and online platforms.

These mediums, however, possess unique challenges that differentiate them from traditional, object-based artworks. In order to circulate in the marketplace, for example, such digital mediums have traditionally been sold on a USB stick, an embarrassingly low-fi solution for a sophisticated cultural product.

The digital art market has been growing exponentially in recent years, but the traditional art market has been slow to adapt and upgrade its systems

¹
Benjamin Sutton. “What You Need to Know from the Art Market 2020 Report,” Artsy.net, March 5, 2020.

²
Ibid.

³
Claire McAndrew, The UBS & Art Basel Art Market Mid-Year Report 2020, Key Findings: <https://theartmarket.foleon.com/2020/artbasel/a-2020-mid-year-survey/>

accordingly. Art galleries that represent artists working in digital formats are in urgent need of a protocol for transacting these artworks — one that will ensure provenance, verify uniqueness and enforce terms for future exhibition and resale rights.

Blockchain.art (BCA) was built to address these specific challenges. Designed by art world professionals, for art world professionals, BCA is a database+marketplace for digital art forms that applies a dedicated blockchain infrastructure to the art market. BCA can also integrate with partner websites (i.e. galleries, museums and art fairs) so they can easily and securely sell digital artworks through their own domains.

Digital artworks traded via the BCA blockchain are “tokenized” via cryptography and receive a unique “BCA-ID”. The results are “non-fungible tokens” or NFTs, which have revolutionized the blockchain since their introduction in 2017 and are now a \$100 million industry.⁴

NFTs allow both digital and material assets to be digitally fingerprinted, so they retain value, scarcity and uniqueness. According to artist and coder Casey Reas, “The blockchain is the key to moving away from licenses toward property for digital media,”⁵ due to the invention of NFTs, smart contracts and the distributed ledger technology that ensures provenance and proof of ownership, which cannot be forged.

All BCA sales are transacted through “smart contracts,” which automate payments and enforce certain terms such as resale rights. By developing a blockchain that cross-functions as a database, as well as a marketplace with an integrated ecommerce solution, BCA empowers galleries and artists to sell more digital art, thereby increasing their revenue while strengthening their digital presence and growing their collector base beyond traditional channels.

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Robert Stevens. “NFTs: A Revolution for Digital Capitalists” Decrypt.co, Nov. 28, 2020. <https://decrypt.co/49541/nfts-a-revolution-for-digital-capitalists>

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Casey Reas. “Art in the Age of Digital Collecting,” Medium.com, Sept. 9, 2019 <https://medium.com/@REAS/collecting-in-the-age-of-digital-reproduction-ab0640a42fe6>

Core Values

BCA is committed to supporting the art ecosystem and building a blockchain solution that integrates with the existing art industry framework. Our core values testify to our dedication to art world, its participants and to future generations:

- 1. CREATE VALUE** Improve sales channels and increase revenue for all art market participants, thereby empowering the entire art world ecosystem. ●
- 2. MANAGE RIGHTS & OWNERSHIP** BCA's smart contracts ensure that managing digital artwork rights and proof of ownership is simple, secure and valid. ●
- 3. ENSURE PROVENANCE, AUTHENTICITY & UNIQUENESS** BCA NFTs allow secure tracking and ownership transference across all sales and resales. ●
- 4. VERIFY IDENTITIES & GROW COMMUNITIES** BCA validates and manages all platform users on the BCA blockchain by authenticating all participants and assigning BCA IDs. ●
- 5. PROVIDE ACCESS** BCA provides an entry-point so the art world ecosystem can access, and leverage, the full potential of blockchain technology. ●
- 6. EMPOWER PARTNERS** BCA allows for future interoperability for partners, from galleries and museums, to artists and collectors. ●
- 7. ENABLE GOVERNANCE** BCA is building a system of governance which invites art world participation. ●
- 8. DESIGN FOR THE FUTURE** BCA is committed to supporting collectors and institutions who are stewards of the digital artworks they acquire, ensuring that these artworks are accessible to the public and to scholars for generations to come.

Key terms and Definitions

Art Proof	The first digital file of a digital edition; the digital equivalent to a “printer’s proof”.
BCA-ID	The cryptographic hash assigned to a user, asset or NFT, so that they/it can be uniquely identified.
BCA-T	BCA’s native cryptocurrency, the BCA Token. BCA Tokens will also be distributed to early stage partners so they can participate in BCA governance.
BCA-Wallet	Secure digital storage for a user’s digital assets and cryptocurrencies, which allows them to transact on the BCA platform.
Blockchain	A shared database that’s distributed across many users/ computers and secured through cryptography.
Blockchain Governance	A system in which rules, best-practices and implementations are determined for a blockchain network by various stakeholders within the same network.
Cryptography	An algorithmic formula used to encode data for security and identification purposes, ensuring that data cannot be tampered with once added to the blockchain.
Cryptocurrency	A unit of currency that only exists digitally.
Digital art	Art that is in digital form, such as video files, audio files, 3D files and other digital media.
Hash	The encryption code used to verify a piece of data, and which allows new records or “blocks” to be added to the blockchain, sometimes referred to as a “digital fingerprint.”
Non Fungible Token NFT	A type of cryptographic token that represents a unique asset. NFTs are tokenized versions of digital or real-world assets. They function as verifiable proofs of authenticity and ownership within a blockchain network.
Smart Contract	A digitally executed and time-stamped contract, in which all terms must be met in order for the transaction to process and be completed.

Vision

Blockchain.art (bc/a) believes that the digital art market will continue to expand as the art world moves online and that bc/a is best positioned to provide a tailored solution for selling and buying digital artworks — one that will both integrate with and improve the pre-existing art world ecosystem.

BCA will accomplish this goal by tokenizing the digital and time-based artworks of our partners as NFTs and developing a marketplace & protocol for their sale (and resale).

During the summer of 2020, the NFT market saw a 57% increase in trading volume.⁶ As the NFT market increases in value and gains recognition beyond the blockchain ecosystem, BCA will be the art industry's most trusted platform for transacting tokenized digital art.

By expanding into the digital art market, established galleries/artists/institutions can create new revenue streams at price points that are accessible to a wider base of potential buyers. Digital editions of iconic artworks, such as Maurizio Cattelan's "Comedian" (more widely known as "the banana duct taped to the wall"), can offer an entry point into the art world for a younger audience, specifically Millennials and Gen Z. These works can be resold within the BCA network and the artist will receive automatic royalties from every transaction.

As these collectors mature, they will already be invested in their favorite artists, gallery brands and museums, setting a new standard of brand loyalty. Eventually, these young collectors will be ready to purchase more ex-

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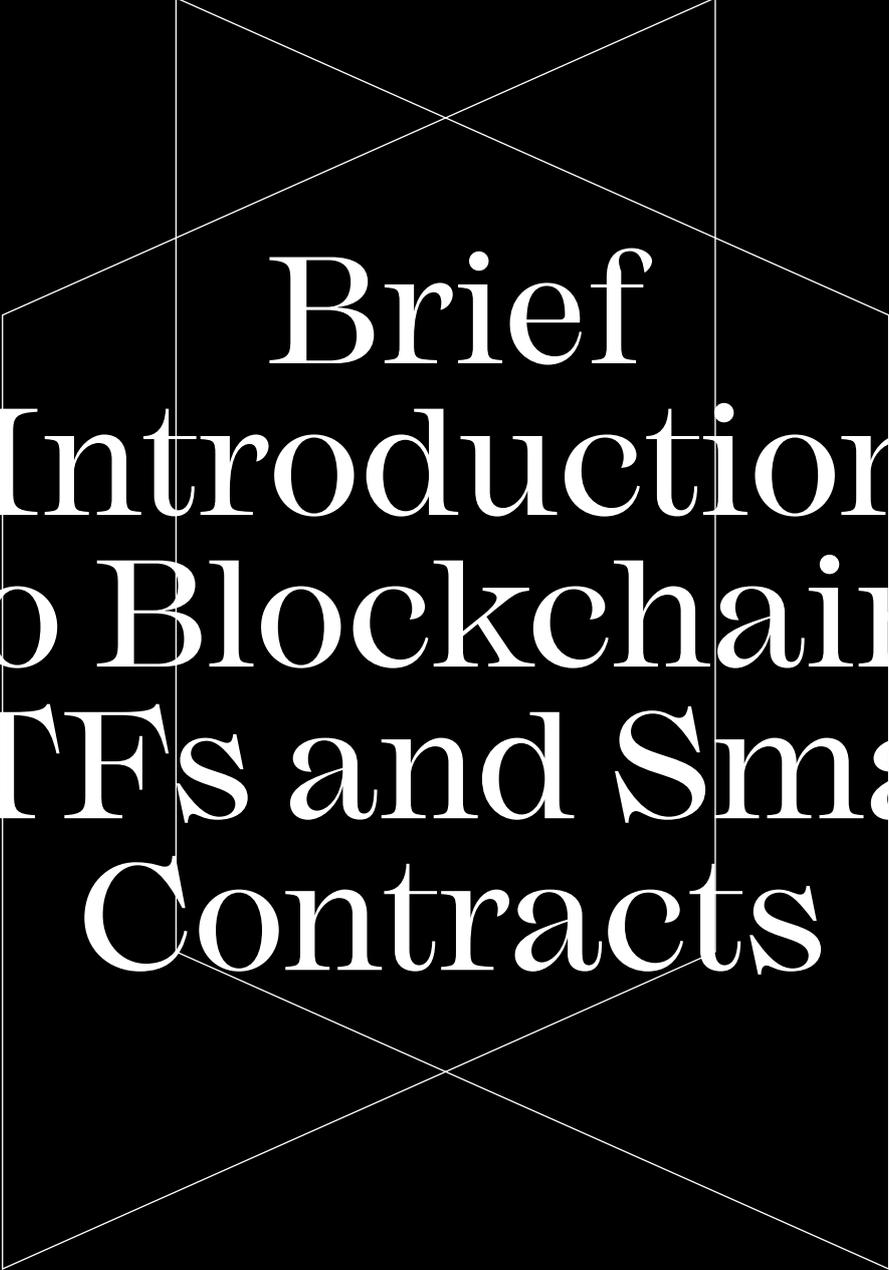
Robert Stevens. "NFTs: A Revolution for Digital Capitalists" Decrypt.co, Nov. 28, 2020. <https://decrypt.co/49541/nfts-a-revolution-for-digital-capitalists>

pensive digital artworks at much higher price points, which they can also buy through BCA, add to their BCA-Wallet and share on social media. BCA will be the foundational building blocks for a new generation of technologically-savvy and digitally-native art buyers.

By developing a dedicated blockchain and partnering with established art world brands, BCA can bypass many of the trappings of the traditional object-based art market: there are no logistics with digital art, no storage fees, and no “insurance-while-in-transit” required. Provenance is verified, uniqueness is assured, and the market is already set up for “peer-to-peer” trades between collectors, allowing the art to seamlessly circulate while accruing value.

Blockchain is a self-governing system. There are different types of users, and multiple levels of nodes which serve various functions crucial to maintaining the health and security of the distributed network. One such function is governance, in which certain users either buy or receive tokens that give them a “stake” in governing the blockchain. These users can vote on issues related to system updates and other changes that help blockchain’s technology stay relevant and user-friendly.

BCA is developing a governance system that industry and art market participants will be able to join via BCA tokens, known as BCA-Ts. We believe that this shared governance will strengthen the BCA network and allow art market professionals to actively shape the future of the platform and thereby the greater art world ecosystem.



Brief Introduction to Blockchain, NFTs and Smart Contracts

Brief Introduction To
Blockchain, NFTs and Smart
Contracts
Blockchain and The Art World
BCA Use Cases
Gallery
Artist
Institution
Collector

A Brief Introduction To Blockchain, NTFs & Smart Contracts

Blockchain first appeared via a cryptography email listserv in 2008 when Satoshi Nakamoto (an anonymous person or a group of people) published their infamous “Bitcoin Whitepaper.”^{7,8}

A blockchain is a digital database that’s decentralized and maintained by numerous users across a network of computers, or “nodes.” Every database record is secured through an algorithm that is cryptographically linked to its preceding record, ensuring the immutability of the entire chain of records or “blocks” (hence the name: blockchain). Each block is assigned a unique ID that’s known as a “hash.” A hash is another word for the algorithm that links the blocks together. It’s a kind of cryptographic signature, similar to a “digital fingerprint.”

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Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System, originally published on metzdowd.com, October 31, 2008, <https://bitcoin.org/bitcoin.pdf>

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A variation of Satoshi’s blockchain was technically invented more than a decade before the Bitcoin white paper first appeared. In 1991, Stuart Haber and Scott Stornetta published, “How to time-stamp a digital document,” in which they outlined their time-stamping technology and how it could enable trust in digital transactions without the need for a third party. This is the basis of blockchain technology.

The Bitcoin Whitepaper was all of nine pages long, a concise solution to one of computation’s most enduring challenges: the “Byzantine Generals’ Problem.” This problem is rooted in game theory and essentially boils down to one question: how does one enable trust in a digital transaction? Satoshi’s answer — the “proof-of-work” chain.

Proof-of-work (abbreviated to PoW) is a “consensus protocol” initiated by Bitcoin, the cryptocurrency that runs on blockchain and can be traded and spent without intermediary banks or governmental oversight. The “consensus protocol” determines that a block has been appropriately hashed and encrypted, and can therefore be added to the blockchain.

In this context, “proof-of-work” is essentially the answer to a complex mathematical problem that various nodes on the blockchain compete against one another to solve using their own CPU power. Once solved, the hash is assigned to the block, thereby allowing it to be added to the chain.

The math problems that miners solve to hash a block require considerable time and energy (both intellectual and electrical) to complete, but are easily verified once solved.⁹ When a node is successful in hashing a block, its user is rewarded with cryptocurrency, such as Bitcoin. PoW also ensures that cryptocurrency has not been double-spent by confirming the validity of each transaction that’s added to the blockchain.

In 2017, the open-source blockchain platform Ethereum launched the Ethereum Implementation Proposal (known as EIP-721), which introduced non-fungible tokens (NFTs) to the crypto world. Fungible assets are luxury assets that are considered to have scarcity value, such as boats, real estate or art. In the digital realm, NFTs are unique digital representations of defined digital assets, which can in turn be linked to physical assets (like how a deed is linked to a house).

Compared to fungible tokens, NFTs cannot be divided (unlike a dollar, which can be divided into four quarters) or replaced by another token of the same type. The prevailing metaphor is birth certificates; your birth certificate is unique and cannot be exchanged for a different birth certificate. As previously stated, in 2020 the NFT market became a \$100 million industry, with a 57% increase in trading in the summer of 2020 alone.¹⁰

The Ethereum Implementation Proposal also introduced the “smart contract,” known as ERC-721.¹¹ A smart contract is defined as a computer protocol that digitally facilitates, verifies, or enforces the negotiation or performance of a contract, independent of a third party.

Everything uploaded to the blockchain becomes data and receives a hash, resulting in an encrypted value that does not resemble the original data. This encryption process allows that data to then be verified

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Satoshi Nakamoto’s peer-to-peer network can be broken down into a simplified protocol of six deceptively simple steps, as published in the Bitcoin paper: 1) New transactions are broadcast to all nodes; 2) Each node collects new transactions into a block; 3) Each node works on finding a difficult proof-of-work for its block; 4) When a node finds a proof-of-work, it broadcasts the block to all nodes; 5) Nodes accept the block only if all transactions in it are valid and not already spent.; 6) Nodes express their acceptance of the block by working on creating the next block in the chain, using the hash of the accepted block as the previous hash.

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Robert Stevens. “NFTs: A Revolution for Digital Capitalists” Decrypt.co, Nov. 28, 2020. <https://decrypt.co/49541/nfts-a-revolution-for-digital-capitalists>

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ERC-721 Token Standard, Ethereum.org, <https://ethereum.org/en/developers/docs/standards/tokens/erc-721/>

algorithmically, without sacrificing security or confidentiality. Smart contracts and hash algorithms ensure that the chain remains immutable, since every hash is dependent on the hash (or block) that came before it. Thus, blockchain-based documents cannot be tampered with or misappropriated in any way.

Blockchain + The Art World

Blockchain.art (BCA) has developed a unique blockchain that is dedicated to the art industry and transacting digital & time-based artworks. We began working on BCA in 2018, based on a need we observed in the art market. Like many other industries, the art world is the midst of a digital renaissance. Galleries and museums are urgently searching for more channels to connect with their buyers and audiences, while artists are experimenting more and more with digital mediums.

Established galleries are fast-paced, lean businesses that generally do not have the administrative bandwidth to quickly develop and deploy emerging technologies like blockchain; the same goes for many museums and cultural nonprofits. These arts organizations need a platform that's been designed specifically for them — one which can support their pre-existing digital channels and seamlessly integrate with their brand. BCA is an industry-specific framework with a user-friendly interface that's written in proper art world vernacular.

BCA is partnering with galleries, sought-after artists and beloved institutions. In doing so, we are enabling a new generation of collectors access to the art market. We're also creating a user-friendly entry point for the art industry into the emerging field of blockchain technology, saving them time and money. BCA provides established art industry veterans (and rising

stars) a highly technological platform that's tailored to their needs, simple to use, and can integrate with their business and ecommerce websites.

There are currently only a handful of companies in the blockchain space that cater exclusively to the art world establishment and, among those, none that were developed to integrate with the gallery ecosystem. In general, the art world's blockchain companies are either purely for provenance registration (i.e. Artory) or function as catch-all marketplaces where unknown artists can upload and sell their own work directly to collectors.

BCA is a necessary upgrade for galleries and other art world participants who are seeking access to the digital art market without sacrificing their brand equity or relying on tech developers who do not understand the art industry. BCA is being built by seasoned art world professionals with input from future gallery partners and artists to ensure that their needs and priorities are accounted for in every stage of BCA's development.

Blockchain.art: Use Cases

BCA is a platform designed to support the sale (and resale) of digital artworks, as well as a tool to manage digital art rights. The first phase of BCA's market entry will be dedicated to partner galleries. The second phase will introduce invited artists and institutions to the platform. Below are 4 use cases which demonstrate the potential of the BCA platform to create new revenue streams and brand loyalty for the art industry.

Gallery X wants to sell an animated gif by their artist, whose work normally sells for \$50,000 - \$150,000. The gif is an edition of 1,000 with 10 APs (Artist Proofs) and priced at \$150.

USE CASE 1:

Gallery

The editions sell out, netting \$150,000 (less the 5% BCA transaction fee) with no logistics, i.e. no packing, shipping, framing or installation required.

The smart contract in this case has been programmed so that the artist automatically receives royalties from every trade when these digital editions are resold in the BCA network. The 10 APs are reserved for museums, who are permitted to purchase the artwork at a discount, as stipulated in the smart contract for the edition.

The APs can also be circulated for exhibition purposes, what is traditionally known as a “loan.” If an edition is exhibited at, for example, the MoMA in NYC, this data point would be added to that edition’s metadata on the blockchain, making it a more valuable edition due to its exhibition history. The smart contract would also enforce certain exhibition terms, including the duration of the “loan agreement.”

Real world example: KAWs animated digital twin of “Companion” sculpture via Perrotin Gallery

An artist is working in physical editions that contain an AR component

USE CASE 2:

Artist

In order to view the edition with its AR feature, the buyer can purchase the artwork through BCA and receive the AR filter as a digital file that includes the artwork's provenance details in its metadata, including its edition number, sales price and other details. The physical edition is shipped separately, but the transaction is not complete until the buyer has both the physical and digital components in their possession.

Real world example: UK artist Tom Webb's AR-enhanced prints

Institution

USE CASE 3:

A well-known museum invites a famous artist/singer to create a special performance that is live streamed to donors and other patrons.

The viewers log on to view the performance through the BCA portal by using tokens they've received from the museum. When the performance is over, there are levels of support that donors can choose to contribute to the museum, for which they receive an exclusive digital edition related to the performance in return.

Real world example: Solange performance at the Guggenheim

bring existing new media collection to the blockchain via BCA

USE CASE 4:

Collector

Collectors who have been acquiring digital and time-based media need a system to manage their collection and track works that have been loaned to various exhibitions (whether at museums, art institutions or biennials). BCA enables collectors to tokenize their artworks, assign IDs and digitally program terms of exhibition rights into smart contracts.

If a collector agrees to loan their video artwork to the Venice Biennial, they could issue a smart contract from their BCA account that's attached to the BCA-ID of that specific digital art asset (ie. the video). The Venice Biennial would then register for their own "nonprofit/institution" account, create their own BCA ID and sign into the platform in order to review and accept the terms of the contract. The edition would then be transferred to the Venice Biennial's BCA-Wallet for a limited duration of time, as stipulated by the smart contract, with exhibition rights, credit lines and other important registrarial details (such as installation requirements including preferred video projector resolution) automatically included.

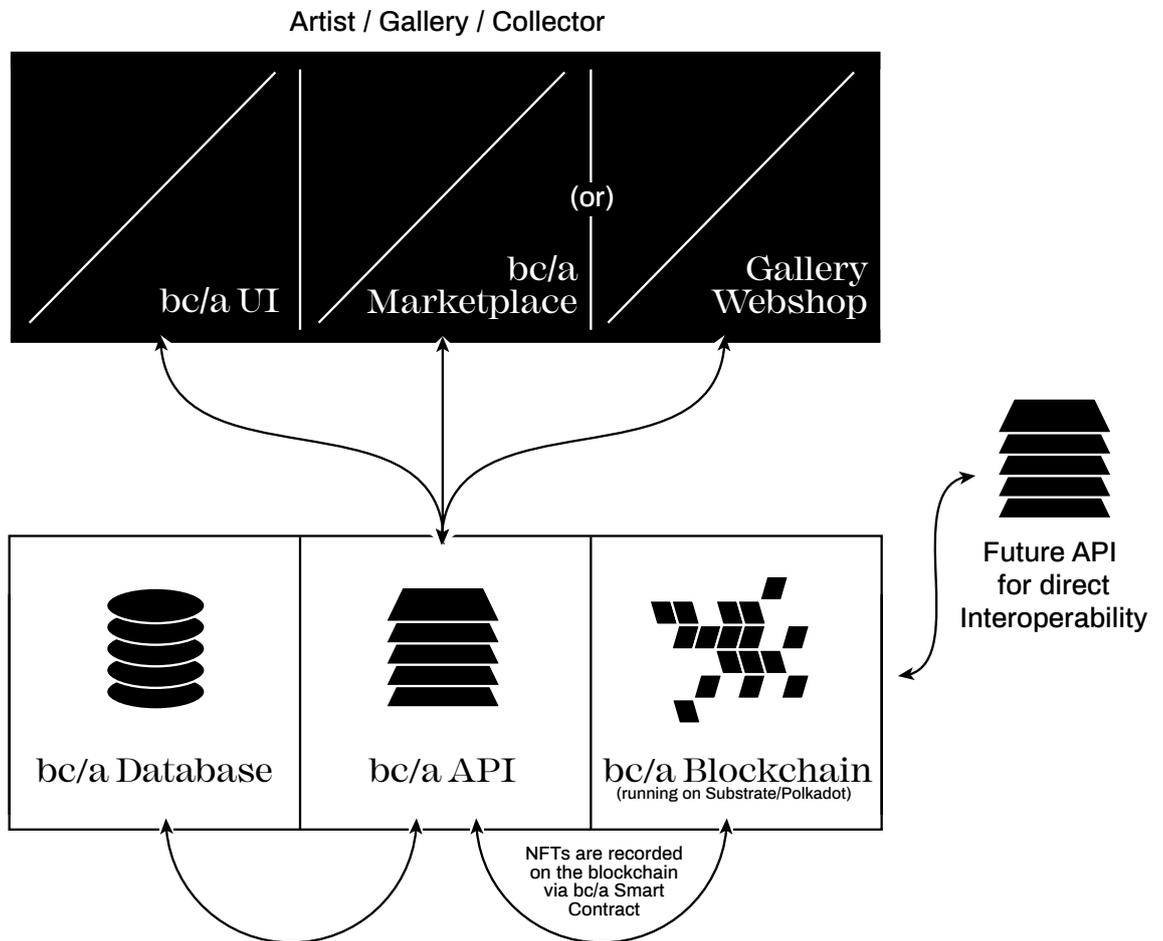
When the loan's exhibition duration (that was stipulated in the smart contract) has been fulfilled, the file would be transferred back to the owner's BCA-Wallet and its exhibition provenance would be updated in their BCA-Wallet registry. The owner of the artwork, as well as the artist, do not have to worry about the video file being lost, corrupted, duplicated or stolen.

Real world example: Arthur Jafa video at the Venice Biennale



BCA System Architecture

BCA System Architecture



Blockchain.art is built on an open-source platform that is programmable, meaning that anyone can contribute to the code, operate a node, and/or build products. The BCA API will allow for direct interoperability, so BCA can scale as it integrates with its partners' webshops. As the art market migrates to the blockchain, more galleries and partners will join the BCA community, participate in governance and grow their digital audiences into sustainable revenue streams.

BCA will launch via the Ethereum blockchain network with the intent to ultimately navigate to the Polkadot network. Ethereum smart contracts provide an initial framework for BCA's functionality. However, BCA is

also co-creating our blockchain with Kusama developers in order to build a blockchain product that is truly innovative and new. To that end, BCA plans to eventually adopt certain principles and functionalities such as shared NFT ownership and governance tokens, while leveraging the Polkadot network's interoperability and security features. BCA will therefore be part of the fabric of the emerging blockchain community.

Ultimately, the BCA unique blockchain code will allow for the following interactions:

-
- BCA will interact with other web stores, such as gallery and museum online shops

 - BCA will interact with other online art marketplaces (ie. Artsy)

 - BCA will interact with other art registries (ie. Artory)

These allowances testify to BCA's commitment to the entire art world ecosystem.

The smart contracts the BCA is developing will serve as authentication of the digital artwork asset. They will also be the sales contracts between parties on the BCA platform and include future rights for exhibition, resale and exploitation so that these terms are clear and automatically implemented by the BCA system.

The BCA platform will have multiple levels: the first will be the BCA database which is the underlying blockchain framework and is essentially the "back-end" of the network. The second level will be the BCA dAPP, which is the user-interface/ BCA API for galleries and other partners. The third level is the public-facing user-interface, where buyers can transact with BCA partners, as well as between one another.

The BCA UI is designed to work within the art industry's frame of knowledge, in that it resembles an artwork collection database. What differentiates BCA from a standard database, however, is that it includes smart contracts to allow for entirely digital contract negotiations, it allows for instant sales and trades, and, of course, it

lives on the blockchain. Through guided trials and qualitative testing with distinguished gallery partners, BCA has created a platform that reflects both the needs and expectations of the art industry.

BCA Governance

Every blockchain has a software repository that contains a source code. This source code defines the blockchain's implementation – its protocol¹². "People involved in a blockchain project need to determine how updates to the software protocol are made. These updates must be coordinated, and this is where governance comes in."¹³ Thus, blockchain governance has been defined as "the means of achieving the direction, control, and coordination of stakeholders within the context of a given blockchain project to which they jointly contribute."¹⁴

Blockchain governance is essential to the successful maintenance of the entire network, because it determines what updates will be implemented, when and how, based on votes by the blockchain's stakeholders. Not all stakeholders are created equal, however, and some have more voting power than others.

BCA's intention is to create a distributed governance protocol with stakeholders from the art industry such as galleries, museums and collectors. BCA will control how and when this distributed governance will be implemented across the BCA network.

BCA retains a majority stake initially until there is absolutely certainty of network security (from hackers) at which point BCA will release power into the community over time. BCA also has a contingency plan in place, in which BCA can override malicious votes by stopping imple-

¹²

Rowan van Pelt , Slinger Jansen, Djuri Baars & Sietse Overbeek (2021) Defining Blockchain Governance: A Framework for Analysis and Comparison, *Information Systems Management*, 38:1, 21-41, DOI: 10.1080/10580530.2020.1720046
To link to this article: <https://doi.org/10.1080/10580530.2020.1720046>

¹³

Ibid.

¹⁴

Ibid.

mentation across the BCA platform. While we don't anticipate the need to veto or override votes, this contingency system is designed to err on the side of caution.

The future BCA governance plan has four distinct pillars:

- 01.** Formalize stakeholder status - BCA stakeholder status will be based on multiple factors, including current stake, previous activities (such as the user's art world profile), creation of value for the community, and how early stakeholders joined the BCA network (ie. "early supporter" status)
- 02.** Issue and implement signaling rights (propose a motion and vote)
- 03.** Issue and implement modification rights, upon successful implementation of signaling rights
- 04.** Implement quadratic voting - gives minority stake voters a greater stake percentage, so they cannot be so easily overruled by more "powerful" stakeholders within the network.

BCA is confident that by enabling art industry partners a stake in BCA governance, the entire network will benefit on numerous levels. Through BCA governance, the BCA blockchain will be more secure, more sustainable over time and will be able to evolve and adapt as technology and the art market continue to evolve and change. By taking the long view, BCA will provide the art world and its stakeholders a blockchain solution that they are truly invested in, giving them the ability to direct and shape the future of the industry.



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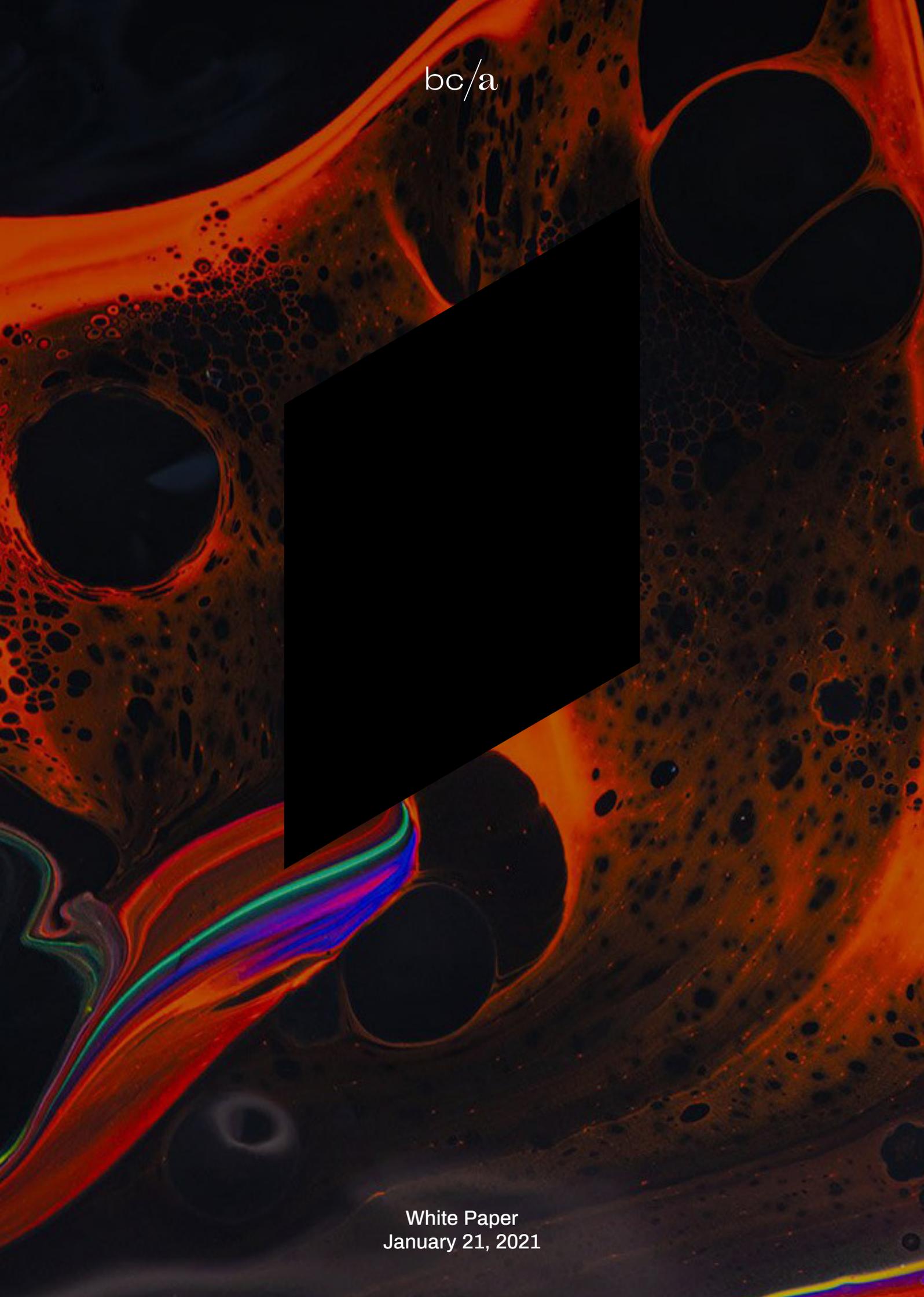
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White Paper
January 21, 2021