TRADING TOKEN WHITEPAPER

TOKENIZING THE ART WORLD

***Trading Token reserves the right to modify this whitepaper at any time.**

Intro

Trading Token Platform (hereinafter "TRADE") is building a next generation global art purchasing platform based on blockchain technology. We believe blockchain has the potential to help accelerate the adoption of the Sharing Economy which has already begun to unleash industry disruption by opening up significant amounts of previously untapped private capacity and tokenization of art may completely change art transactions and ownership transfer as we know them. With a secure, tamper-proof system based on the blockchain, users can trade artwork on our platform and bypass intermediaries in broker deals, transacting P2P (peer-to-peer), all of which will enhance ease of use and security for all parties alike, streamlining user experience and driving accelerated adoption.

The art industry is a huge industry worldwide that is used for personal enjoyment and tax benefits. TRADE platform seeks to help subdivide individual pieces of art into tokens and list them on exchanges. Such endeavor would ease transfer of ownership, simplify fractional holding without minimal constraints, alleviate tax inefficiencies, make cross-border transactions simple, and eliminate substantial overhead faced in certain jurisdictions due to unnecessary middlemen. Tokenizing art will allow art assets to be uniquely identified via a digital record that contains information regarding occupancy, physical characteristics, legal status, historical performance, and financial position.

1. Deloitte Art and Finance Report 2017

https://www2.deloitte.com/content/dam/Deloitte/at/Documents/finance/art-and-finance-report-2017.pdf

Further, TRADE addresses both the short and long-term art buyers by lowering fees, using decentralized conflict resolution and making this market truly P2P, eliminating various middlemen, and also ensuring they are stored on an immutable blockchain.

TRADE platform is being developed as an open source framework with respect to both P2P network and tokenized art assets, which continues to operate and trade on the Ethereum network, independent of platform's contributors. TRADE provides a clean UI, utilizing EVM contracts under the hood. Additionally, ("TRADE") platform tokens may be traded on centralized digital asset exchanges as well.

Eventual moonshot goal of TRADE, once government registers are fully blockchain-compliant and have distributed ledgers, is to partner with various art galleries to make buy and sell transactions of smaller units feasible with integration.

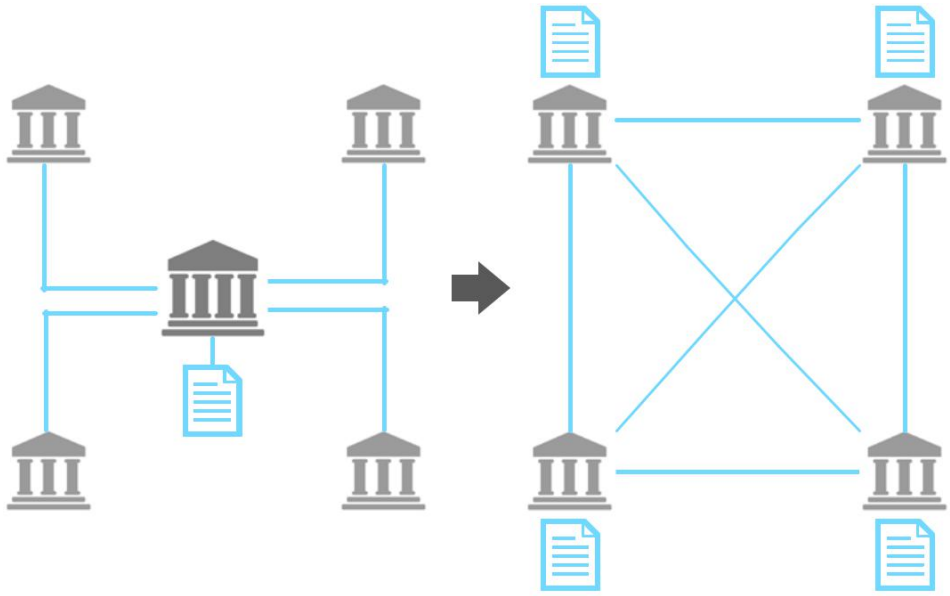


Figure 1. Recording Ownership with Distributed Ledger Technology

Blockchain will entirely reshape the art industry. While blockchain technology is still in its infancy, and complete decentralized ledger of global art is not going to happen overnight, TRADE plans to take a leading role in all facets of art purchases globally to make this a reality, starting with disrupting the art buying market and tokenizing large art assets for trading. Please refer to our timeline below for detailed overview of our current progress and future goals.

Abstract

In its current iteration, TRADE provides two main features to address known problems in today's global art market: Tokenized Ownership and Peer-to-Peer Rentals.

Tokenized ownership will simplify every type of operation with art purchases, including purchase investments and ownership transfers, either partial or complete. Art tokens representing a share in art ownership will allow for a liquid art market with transparent prices (price discovery). Please note that TRADE tokens are essentially membership certificates in the TRADE Platform, which give numerous rights and privileges to their owners provided

compliance with KYC/AML policies of TRADE and proof of member activity confirmed by running an TRADE node on the member's computer, as discussed in more detail later. There is no passive expectation of income solely from holding TRADE tokens.

TRADE operates as a custom decentralized system, governed by the DAO family built on Ethereum. The platform is powered by its core token, abbreviated as "TRADE".

TRADE tokens are essentially membership certificates in the TRADE Platform, which give the following rights and privileges to their owners provided compliance with KYC/AML policies of TRADE and proof of member activity confirmed by running an TRADE node on the member's computer:

- Listing fee charged in ERC20 compliant art tokens, in all art listed through the TRADE Platform during their initial art token offerings. The platform enables art owners and developers to tokenize art by creating customized smart contracts and perform a token distribution to either sell art (partially or completely) or attract financing for its construction. Fees are initially set at 7% of the underlying asset and, subsequently, determined by voting of the TRADE token holders. After a successful token sale, an agreed part of the art tokens is released out of TRADE escrow to TRADE token holders proportionately, provided such TRADE token holders are running an TRADE node on their computers. There is no passive expectation of income solely from holding TRADE tokens.

- Commissions from P2P purchases are imposed on the lessor, as a small fee, once a transaction with the lessee is finalized. These commissions are distributed to the TRADE token holders running an TRADE node on their computer. The size of this fee is determined by voting of the TRADE token holders.

- Ability to work, and earn extra income, within the framework of TRADE as an arbiter for conflict resolution in P2P rentals, moderated via an arbiter rating system. As a result of this work funds withheld from the escrow of the losing party are distributed to the TRADE token holder who performed the arbitration.

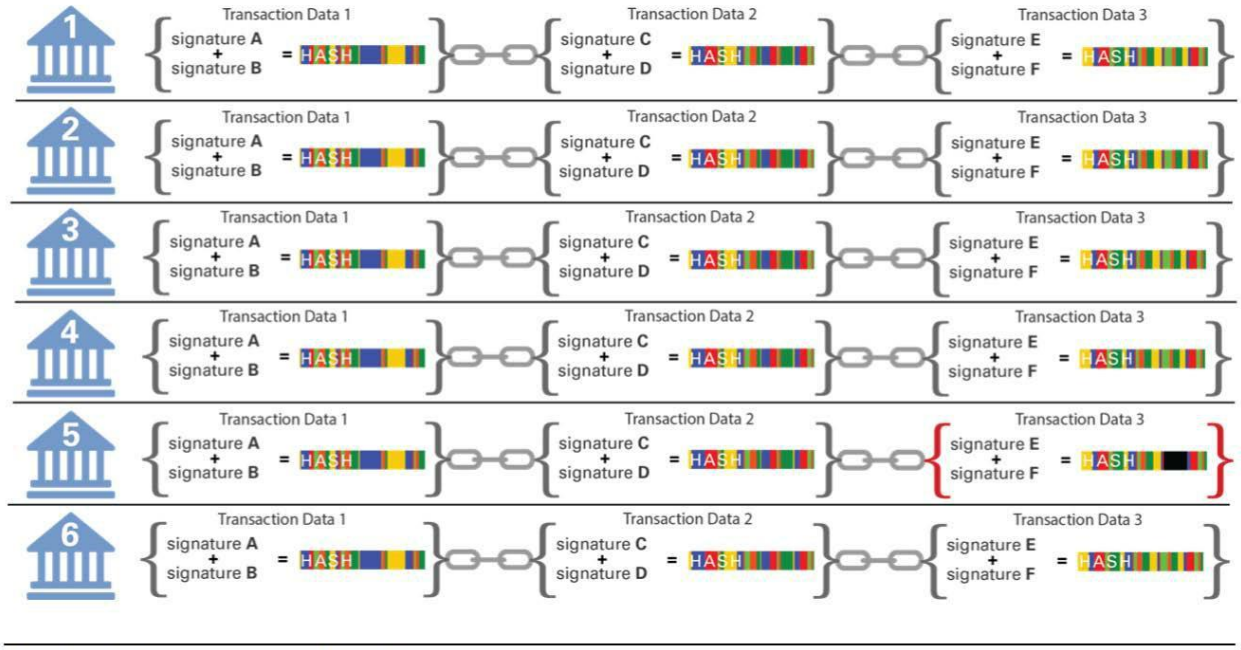
- Influence on the platform and ability to propose, vote on and aid further developments to improve the efficiency of artwork globally, as well as boost TRADE global adoption and growth.

Token holders agree upon every decision taken within the platform, affecting both tokenizing art and by the use of a voting mechanism. TRADE token holders vote for or against the proposals created by most reputable holders, covering all activities within the platform.

Blockchain – Quick Review

Blockchain is fundamentally a new type of database technology that is optimized to tackle a unique set of challenges. Historically, databases have been used as central data repositories by organizations to support transaction processing and computation. However, databases are rarely shared between organizations due to a variety of technology and security concerns. Blockchain is a shared, distributed database of transactions among parties that is designed to increase transparency, security, and efficiency. Blockchain is a database (with copies of the database replicated across multiple locations or nodes) of transactions (between two or more parties) split into blocks (with each block containing details of the transaction such as the seller, the buyer, the price, the contract terms, and other relevant details) which are validated by the entire network via encryption by combining the common transaction details with the unique signatures of two or more parties. The transaction is valid if the result of the encoding is the same for all nodes and added to the chain of prior transactions (as long as the block is validated). If the block is invalid, a "consensus" of nodes will correct the result in the non-conforming node.

The blockchain ledger is replicated across multiple locations (we show just six in Figure 7 for simplicity), and each maintains its own copy, which is separately updated based on new transaction data. We show a sequence of three transactions. In the first two transactions, data and signature information are properly validated by all six nodes with matching "hash" values. However, for Transaction #3 at Location #5, the hash does not match the others, and will be corrected by the others via "consensus."



Source: Goldman Sachs Global Investment Research.

Blockchain has the following advantages over a conventional centralized database:

- Security: Blockchain relies on encryption to validate transactions by verifying the identities of parties involved in a transaction. This ensures that a "false" transaction cannot be added to the blockchain without the consent of the parties involved. A complex mathematical calculation known as a "hash" is performed each time a transaction is added to the blockchain, which depends on the transaction data, the identities of the parties involved in the transaction, and the result of previous transactions. The fact that the current state of the blockchain depends on previous transactions ensures that a malicious actor cannot alter past transactions. This is because if previous transaction data is changed, it will impact the current value of the hash and not match other copies of the ledger.

- Transparency: By its very nature, blockchain is a distributed database that is maintained and synchronized among multiple nodes – for example, by multiple counterparties who transact with each other frequently. In addition, transaction data must be consistent between parties in order to be added to the blockchain in the first place. This means that by design, multiple parties can access the same data (in some cases locally within their organizations) – thus significantly increasing the level of

transparency relative to conventional systems that might depend on multiple "siloed" databases behind firewalls that are not visible outside a single organization.

- Efficiency: Conceptually, maintaining multiple copies of a database with blockchain would not appear to be more efficient than a single, centralized database. However, in most real-world examples (including several of the case studies we examined in capital markets), multiple parties already maintain duplicate databases containing information about the same transactions. In many cases, the data pertaining to the same transaction is in conflict – resulting in the need for costly, time-consuming reconciliation procedures between organizations. Employing a distributed database system such as blockchain across organizations can substantially reduce the need for manual reconciliation, thus driving considerable savings. In addition, in some cases blockchain offers the potential for organizations to develop common or "mutual" capabilities that eliminate the need for duplication of the same effort across multiple organizations.[4]

Problem – Buying & Selling Art

Art throughout time and to this day remains a great source of wealth for high net worth families. History tells us that many great fortunes have been made and lost in this asset class than any other. Over time, various attempts have been made to make this market more manageable and liquid, nonetheless every individual or institution which buys and owns artwork faces nontransparent transaction costs, asymmetric information, art rights opaqueness, variability in fees, and a host of other issues.

Efficient Market Hypothesis Theory states that the price of a security at any given time reflects all the available pertinent information. While there may be appropriate application for this theory relative to exchange tradable assets such as stocks and bonds, it is currently inapplicable relative to art. While over the long-term pools of art might be relatively price-efficient, purchases of a particular artwork are often driven by individual circumstances and done with imperfect information, and limited number of buyers.

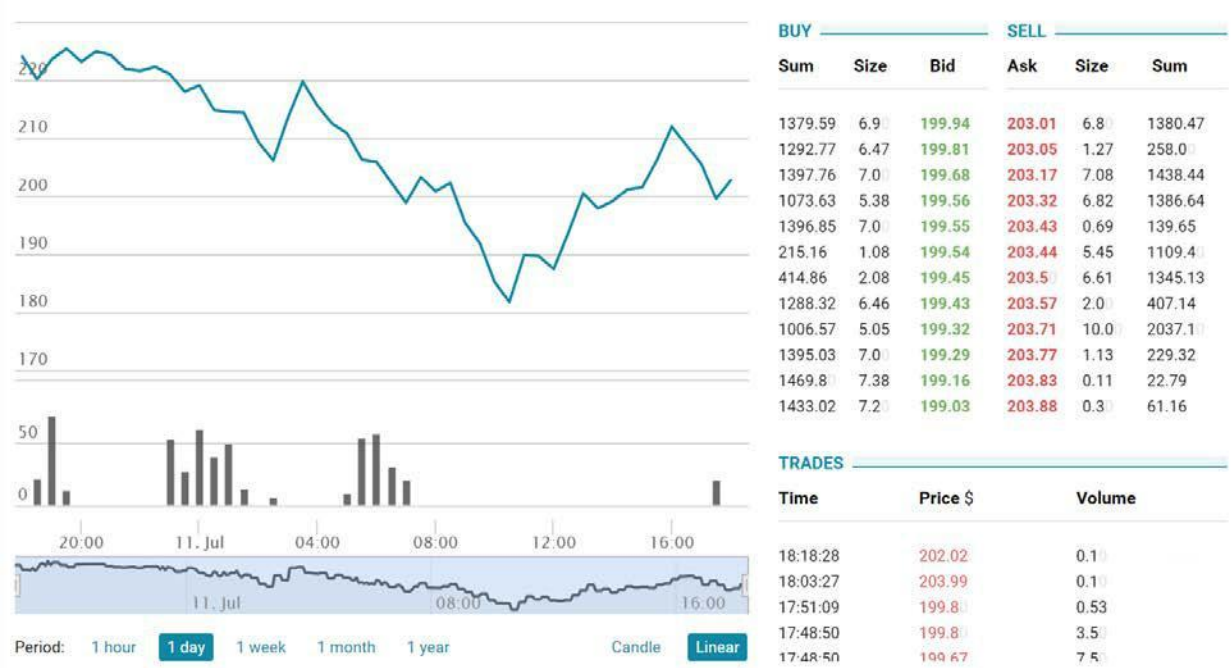
Most art ownership globally is single ownership, or at most divided between just a few parties. This creates a problem as rising prices have outpaced consumer income and savings and have left ability to purchase art assets to just a small subset of the population. Further, high

transaction costs and inefficiency in transactions themselves make redistribution of this market sub-optimal.

Also, investing in art for most individuals and corporations typically lacks any global reach as paperwork, due diligence and administration in a foreign jurisdiction involves knowledge and prohibitive costs.

Solution – Buying & Selling Art

With rapid rate of adaption of crypto-assets, TRADE strives to remedy the situation of illiquidity and opaqueness in the art market. TRADE serves as a turnkey solution for listing an art asset for trading in a tokenized form in a similar way that stocks are listed on exchanges such as FTSE or DAX.



TRADE token holders, being the platform's members, work with art owners or brokers willing to sell their art assets or a part of their gallery to raise funds. Decentralized voting is performed with the use of smart contracts to either accept or reject a new piece of art. In case a new item is approved to list on the platform, TRADE holders vote for the art's law firm and management company.

Approved lawyer, or competent local authority in each respective jurisdiction, verifies legal documentation provided by the listing party and digitally signs each document pertaining to the art. Once signed by the local authority, each document is hashed and pushed into the TRADE Distributed Data Store ("TRADE"), while its hash is recorded in the Ethereum blockchain. This ensures that documents become immutable and virtually impossible to forge, as any change made inside an TRADE document will lead to a different hashing result, which would differ from the hash previously recorded in the Ethereum blockchain. By applying this operation to every item stored in TRADE, we create a permanent link to every document from the tamper-proof blockchain. As sometimes documents need to be updated legally, we use TRADE versioning provided by the IPFS protocol[5].

Once all decisions covering a new listing are made, TRADE holders verify both a Ricardian contract (RC)[6] and contract created by a listing party. Ricardian contract is digitally signed and linked to the corresponding smart contract, making the contract legally binding. Ricardian contracts are stored in TRADE. The final step of the process involves voting for the deployment of smart contract into the Ethereum network, which effectively enacts the start of art tokenization. Art tokens are issued by the contract in exchange for TRADE and ERC20 tokens. Once initial art token distribution is finalized, TRADE token holders who have carried out work of running an TRADE node to secure the TRADE network, receive a fee charged in art tokens, which are ERC20 compliant. Tokens raised from the proceeds of the sale are subsequently released from TRADE escrow to the selling party in case of a successful sale (determined by the contract).

Subsequently, the tokenized art trades with bids and offers with order matching to create a state of equilibrium, reflecting true value of the item at a given time. TRADE provides a decentralized exchange service to facilitate trading of both platform tokens and art tokens. Trading is done in a decentralized way with the use of Ethereum exchanges.

Liquidity and true price of the asset which this system attempts to create, enable market participants to resolve many problems which currently make the market inefficient. Examples of this are collateral management for art assets in a dynamic price environment, as value of collateral can be easily determined, and collateral itself can be transferred via other blockchains. Further, store of wealth and inheritance can be easily written into smart contracts.

Additionally, platform tokens ("TRADE") can be tradable at existing centralized exchanges after the end of the contribution period.

Solution – Eliminating the High Middleman Fees

Although P2P art purchases are already on a steep growth trajectory, in terms of both market awareness and adoption, we see an opportunity for blockchain to increase volume, safety, quality, and effectiveness of the transaction process. High transaction costs and safety concerns remain significant challenges to the adoption of P2P art purchases and are areas where we see potential for blockchain technology to disrupt the existing framework.

Any lessor may get listed on the platform by providing a real-world identity and sending a security deposit into the escrow contract provided by the platform. This is a protective measure against rental listing spam and TRADE bloating. Initially, lessor creates both Ricardian and contracts by means of TRADE software, which are then automatically interlinked and deployed in TRADE (Ricardian) and Ethereum (contract). Lessor's real-world identity is located inside of the Ricardian contract stored in TRADE. Once the smart contract is deployed, the lessor sends a security deposit to the appropriate smart contract, which acts as an escrow and discourages possible dishonest behavior of the lessor.

Platform's approach towards identities gives tenants full control over their own privacy. While they are encouraged to complete profiles fully, it is possible to have a pseudonymous identity or decide to subsequently reveal identity to lessor or arbiter (e.g. via Keybase[9]). Lessors are required to provide real-world identities in order to get listed as a seller. Considering other entities on the platform, we share the approach of the Aragon[10] project towards identity in the decentralized network:

- Identity is opt-in. Entities are free to transact pseudonymously.
- Entities are free to choose how they want to identify themselves, and what identity providers they consider valid to identify others.
- Identity belongs to the individual or organization, which means that the only entity which can provide the ultimate truth about their identity is themselves or entities they personally appoint for this (through cryptographic proofs).

Tokenization and Listing for Trading of Art

Art Inventory and Sourcing

TRADE allows art owners and brokers to tokenize their assets and list them for trading. TRADE token holders will endeavor to find new art and also accept incoming requests from such entities. Initially TRADE plans to tokenize art in select transparent jurisdictions such as continental Europe and UK, and eventually, as our expertise grows expand globally to capture further market share. Sourcing and diligence for each jurisdiction will be done in accordance with existing laws and procedures in each jurisdiction.

Art Token Offering

Once an item has been identified and verified, and its details published on the platform, a date will be set for the arts' Art Token Offering ("ATO"). Price for the piece offer will be taken from the gallery or selling party. Intermediaries who digitally signed all certificates and will be handling transfer of ownership are involved off the chain with TRADE supervising the process. All requisite documentation and offering documents will be published on TRADE for prospective ATO holders to assess the item for potential purchase. Subscription will be handled via smart contracts and aggregated into a fund which will be collected via TRADE escrow from the start of the ATO until expiry date set at the start of the process. If during this time period the fund has not reached capacity, TRADE escrow will release tokens back to the addresses of the token holders. Should the fund reach capacity set forth by the seller, funds will be sent to the seller and ATO tokens will be distributed to the token holders of the art. Subsequently ATO tokens will be listed for trading on exchanges, starting from the decentralized exchange to increase liquidity and price discovery of the tokenized art asset.

Rental Income

One recurring income as with traditional art holdings is rental income. It is the duty of the art management company to collect this income and redistribute it to token holders. Art income is distributed automatically by using the art contract functionality, allowing for redistribution of funds in any ERC20 compliant token or ETH to platform token holders proportionately to their ATO holdings on the TRADE Platform.

Art income is distributed to the art token holders after fees are deducted by the management company, and the reserve fund is topped off should it be less than 10% of the art price for the past 6 months of trading, or initial price of the ATO if 6 months has not elapsed.

Reserve Fund

During the ATO of an art asset, a 10% reserve fund will be created and held in the smart contract escrow of the art DAO, or child DAO. The reserve fund is proportional art of the asset's token holders, however it is held in escrow, to pay the management company and cover any unexpected costs associated with the item. In the secondary market when art tokens are trading, while the reserve fund itself will not be transferred from the seller to the buyer during trading, price of the tokens will imply the reserve component in their price. This is true due to the fact that if the item is completely sold, in the event of a buyout or squeeze out, the reserve fund will be liquidated, and proceeds distributed to former token holders pro-rata.

Services which will be covered by the reserve fund are structuring fees, escrow fees, art maintenance and repair fees, art management fees, taxes, insurance fees, renovation fees, legal costs, and any other auxiliary expenses born by the management company in servicing the asset. The management company has discretion over the reserve fund for day to day expenditures, in the event that single proposed expenditure does not exceed 3% of the value of average of 6 months trading price of the asset or initial price of the ATO if 6 months has not passed elapsed. Expenses which exceed this threshold are voted on by ATO holders.

Due to current cryptocurrency volatility reserve fund assets will be automatically converted, via a smart contract, to fiat-like currency via a stable token upon entering the reserve fund. The reason for this is that spending associated with the reserve fund is closely associated with fiat currencies. Funds from the reserve fund will be paid as necessary to the management company, which would be controlled by the use of a voting system (choice of the management company). The management company will have access to the reserve fund, however possibility of embezzlement will be minimized via the TRADE Platform, by tracking the transactions made by the management company in a real-time and by voting on proposals to choose a different management company.

Reserve Fund Drawdown Provision

In the event that the reserve fund is drawn down to 2% of average 6 months trading price, or initial price of the ATO if 6 months has not elapsed and is not replenished in time by proceeds from rent, liquidation of the item will commence. Art token holders will vote on a listing broker/public marketplace and upon sale of the art, proceeds of the sale and the reserve fund minus applicable brokerage commissions will be proportionally distributed among ATO token holders.

Duties of the Management Company

Management company is responsible for:

- Physical management of the item, including regular maintenance and emergency repairs. They must also perform repairs when there is an issue or must hire someone to attend to it.

Change of Management Company

Every year, art token holders will vote whether to keep or change the art management company. If more than 50% of token holders vote to change the management company, a proposal will be put forth to token holders to select a licensed management company from a list of proposed locally respected providers.

Buyout or Purchase of Significant Stake

Similar to fiat exchanges any token holder may propose to buy out the art in its entirety or purchase a significant stake of the tokens. This will enact a smart contract voting mechanism whereby token holders will vote to accept or reject the price offered to them. A threshold of 95% of token holders is necessary for mandatory buyout procedure to take place. In this event the acquirer will receive 100% of all tokens, in exchange for ETH which will be distributed pro rata among former token holders. If the acquirer chooses to buy a significant stake and not purchase the art entirely, token holders will be able to tender their tokens at the proposed price.

Delisting/Buyout of the Art

In the event that a majority token holder acquires 90% or greater position in the asset, a squeeze-out clause may be enacted, by this token holder, whereby reaming token holders will

be bought out at the average price of 6 month of trading, or initial price of the ATO if 6 months has not elapsed.

Details of Art Offerings

TRADE has specific requirement and process for listing ATOs which involves the following:

1. Listing of technical and legal documentation of the art asset on TRADE sufficient for ownership transfer in said jurisdiction.
2. Art asset must meet requirements of the platform and having a holding structure which is absent of liens. This limit is imposed initially during the pilot of the TRADE Platform and will be further refined by TRADE token holder voting. Subsequently TRADE token holders will be able to vote to modify this value in general, or on a case-per-case basis.

3. TRADE token holders will vote on the competent legal entity which will verify validity of the transaction and art in respective jurisdiction.

4. If the law firm or competent authority in the item's jurisdiction renders a positive decision, with respect to the holding structure, and ownership of the asset, the ATO will be generated with the number of tokens equal to the square millimeters of the asset.
5. TRADE acts as an escrow of ETH or BTC which are sent by subscribers during the initial ATO of the asset. Subsequently, after the asset is inserted into a Special Purpose Vehicle (SPV) structure and tokenized, escrow assets are released to the seller of the art asset.
6. Listing fee equal to 7% of the newly issued ATO tokens are retained by TRADE Platform, and distributed pro rata to TRADE token holders who have gone through KYC/AML and have done work as an active node on the TRADE platform.
7. Reserve/insurance fund is created for every ATO. This fund remains the property of each token holder, however it is escrowed if the SPV which owns the art needs to spend funds on the management company, lawyer fees or other unforeseen circumstances.
8. After the ATO takes place, tokens of the asset are listed and trade freely on the TRADE platform.

Trading of Tokenized Assets

TRADE codebase includes decentralized exchange smart contracts to allow for a safe and secure method of exchange between Platform tokens ("TRADE") and art tokens (e.g. "TRADE"). Ether and other ERC20 tokens may also be exchanged for art tokens on the decentralized exchange.

Exchanging tokens by means of this model reduces a number of risks associated with traditional centralized exchanges – e.g. a risk of failure to fulfill its obligations to customers. Nevertheless, it is possible for some part of the tokens to be tradeable at centralized digital currency exchanges as well. From an economic point of view, there is an incentive for both TRADE token holders and art token holders to contribute to tokens being traded at centralized exchanges.

Tokens are traded via a traditional two-sided market consisting of bids and offers. If there are more buyers or sellers the market mechanism will move the token price, and thus the market capitalization of the asset, to a clearing level in accordance with the market's assessment of the art value.

Technology

Overview

In terms of technology, TRADE Platform is a standalone P2P network with the custom protocol built for purposes of digitizing art in a decentralized way. This network is governed by Ethereum smart contracts (TRADE DAO family), implementing and enforcing rules for entities to interact in tokenizing art.

TRADE uses a list of technological concepts to implement the model described above. Ethereum platform with its virtual machine (EVM) is by now the most established blockchain-based distributed computing platform with smart contract functionality. It powers both tokenization and contracting aspects of the TRADE Platform.

The platform implements its own protocol, responsible for data distribution and mirroring, historic versioning of documents, distributed data storage, and arbitration in the decentralized network. The rest is implemented in the form of Ethereum smart contracts and executed by EVM: DAO family, voting on proposals, escrow, core and art tokens, rental agreements and auxiliary contracts. The TRADE protocol provides a bridge, connecting the TRADE network with the Ethereum-based smart contract infrastructure governing the TRADE Platform.

TRADE Technology Stack

TRADE Platform software components are being developed using the following stack:

- Go
- Solidity
- JavaScript
- Electron
- EthereumJS
- web3.js
- Vue.js
- IPFS

We apply appropriate technology in accordance with the tasks to be accomplished.

Our core node software which is doing the heavy-lifting is written in Golang and utilizes a modified IPFS node. Smart contract family is written in the Solidity language native to the Ethereum platform. Ethereum was chosen as the most trustworthy environment for execution of Turing complete[15] smart contracts. The desktop client is made with Electron framework, using JavaScript and helper libraries to work with EVM contracts, and communicates with the core node running the TRADE network.

Web client development is among our top priorities because it simplifies working with the TRADE Platform and will ultimately contribute to mass adoption of said platform. It is built with the VueJS frontend framework.

TRADE Software Components

TRADE Platform comprises the following software components:

- trade-go (Go)
- trade-desktop (Electron)
- trade-dao (Solidity)
- trade-web (Vue.js)
- go-ipfs (forked)
- go-onion-transport

TRADE core node software is the low-level component, containing implementation of the TRADE protocol (trade-go). Core node software is responsible for running the TRADE P2P network and managing data flow through, establishing the data tier of the TRADE Platform. Core node utilizes a modified IPFS node, which is capable of historic versioning, mirroring and reliable data distribution across the TRADE network. TRADE node handles several data structures, including art documents, arbiter registry, peer identities, Ricardian contracts. Node software contains an implementation of TRADE, which is built on top of IPFS to provide a reliable way of distributed data storage. The trade-go component utilizes go-ipfs and go-onion-transport for the purposes of data distribution. We have selected the IPFS protocol due to its principles of decentralization and support for data encryption and historic versioning (similar to git).

Desktop client communicates directly to the TRADEnode and represents the presentation tier of the TRADE Platform. It interacts with the Ethereum network directly and contains a contract creation toolset. Depending on the user role (e.g. host), the client offers a set of ready-to-use contract templates and additionally a smart contracts designer. Once the contract is created, the

client provides it in two versions: Ricardian contract and the EVM contract. Users is requested to digitally sign the Ricardian version of the contract in order to proceed with its deployment. Once the Ricardian contract is signed, desktop client interlinks it with the EVM contract, hashes the whole contract and creates the Ethereum transaction containing the Ricardian contract hash digest. Once the transaction gets broadcasted and subsequently confirmed, desktop client passes the signed Ricardian contract to the node, which in turn inserts it into the TRADE. The client supports several roles, including art gallery, and arbiter. It has a built-in wallet dedicated for storage and use of the platform tokens (TRADE), art tokens and Ether. Voting on proposals is available for TRADE token holders and art token holders. Opt-in identity management is supported (via Keybase and in the future, other identity providers).

Web client shares the functionality of the trade-desktop component, but communicates with remote TRADE nodes for complete functionality. Although this approach harms decentralization in the short term, we believe it will lead to global adoption and fast-paced growth of the TRADE Platform. Independent nodes will continue to operate as standalone applications powering the TRADE network even after the full-featured release of platform's web version.

DAO component (trade-dao) comprises a set of EVM smart contracts written in Solidity. These contracts govern core platform changes, art tokenization, token exchange and peer-to-peer rentals by creating a business logic tier. This is a high-level component, forming a framework of self-enforcing agreements between multiple parties in the field of art. Some examples are smart contracts in the trade-dao component which regulate and enforce agreements between the platform DAO and lessors, art token holders and the management company.

Ricardian Contracts

The Ricardian contract is a method of recording a document as a contract at law, and linking it securely to other systems, such as the accounting system, for the contract as an issuance of value[16].

RC is a software design pattern to digitize documents and have them participate within financial transactions, such as payments, without losing any of the richness of the contracting tradition. Publication of the content and reference to that content by the unique cryptographic message digest eliminates frauds based on multiple presentations.

The final goal of the Ricardian contract is to make the contract's format both machine readable, such that they can easily be extracted for computational purposes, and readable as an ordinary text document such that lawyers and contracting parties may read the essentials of the contract conveniently[17] order to be recognized as a valid RC, contract's digest should match the one stored in the blockchain. This ensures that none of counterparties can amend the terms of agreements retroactively, eliminating potential disputes that may arise from hearsay claims between counterparties.

At TRADE, we use Ricardian contracts in addition to EVM contracts to ensure that smart contracts have a legal force. This is implemented by using both the Ethereum blockchain and TRADE distributed data store. We have applied the principles described above and extended them as follows:

- Every deployed EVM contract has a corresponding Ricardian contract (interlinked by pointing at each other's unique IDs)
- Every Ricardian contract linked to an EVM contract is stored in TRADE
- Every Ricardian contract stored in TRADE has its Ricardian contract digest stored in the Ethereum blockchain

This approach ensures that one cannot forge a smart contract address inside the RC, as this change would prevent the Ricardian contract from being recognized as a valid contract.

Technically, Ricardian contract is a digitally signed and cryptographically verified electronic document that records an agreement between multiple parties, formatted to be human and machine-readable (e.g. JSON format[18]). By applying a cryptographic hash function (one-way hashing) to the RC, we receive the Ricardian contract digest as an output, which is immediately recorded into the blockchain. This eliminates possibility of forging the RC, as any change to its data would completely change an overall Ricardian contract digest. World's most established blockchains Bitcoin and Ethereum guarantee that any Ricardian contract digest would remain unchanged once the transaction containing that digest is included into the blockchain block. In Ricardian contracts used by the TRADE Platform are legally binding contracts, the terms of which will be unequivocally interpreted by courts of law. Digitally

signed and cryptographically verified, these RCs point to corresponding EVM contracts, which ensure the implementation of agreements at the application level.