



CRYPTOART.AI

CRYPTOART.AI WHITE PAPER

A DIGITAL PLATFORM TO CONNECT CRYPTOART

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I

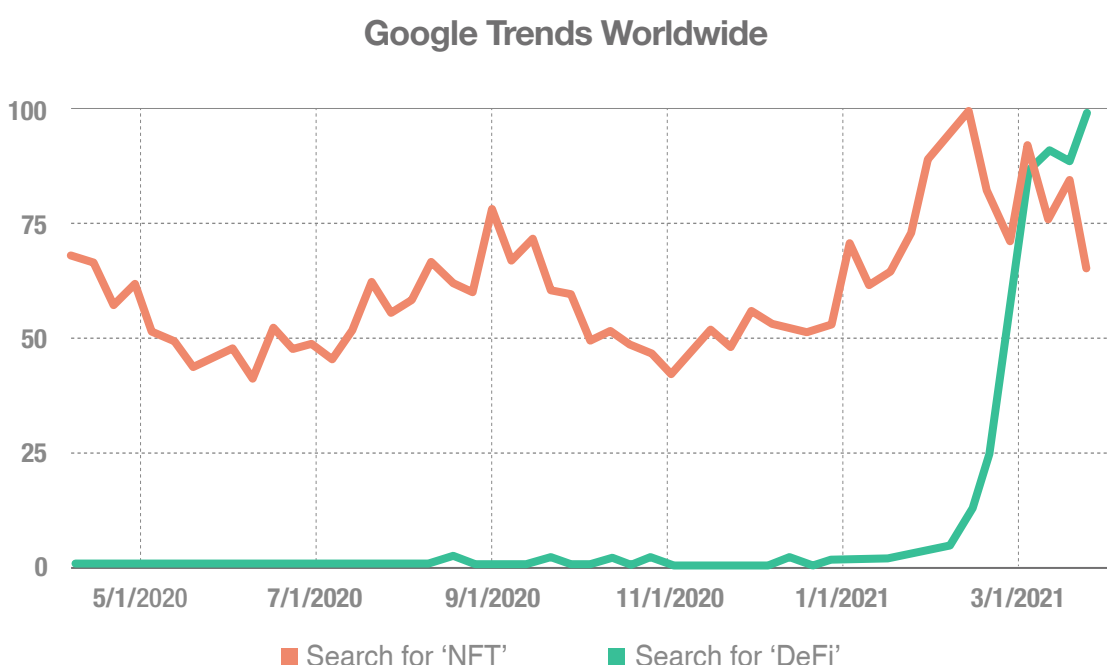


The wave of encrypted art

■ 1.1 The interaction of DeFi and NFT

Blockchain has also brought a new mode to the financial industry, namely decentralized finance (DeFi). The decentralized finance is a new type of financial system developed based on the core idea of blockchain technology. It can provide users with equal opportunities to obtain financial services without being restricted by banks or financial institutions, allowing users to have more manners to control their own wealth freely, become more democratic in financial activities and make people's wish to pursue financial freedom one step closer to the reality.

In the first quarter of 2021, we observed the potential of the non-fungible token (NFT) market, which has increased people's interest in NFT technology, digital art, and the virtual world. At the same time, the DeFi ecosystem continues to lead the industry, but it turns out that DeFi is not the only eye-catching point of the blockchain.



The trend of NFT integrated financial concepts started in 2020. Under the continuous influence of DeFi products, more NFT products of the new generation are released according to DeFi protocols, and NFT products have gradually changed from simple collectable ownership confirmation instrument to more complex financial instrument..

NFT provides a high degree of interoperability and can be regarded as a representative of non-traditional assets. This means that NFT can be used in many fields. In all application fields, NFT is meant to represent a certain value. The management of value can be completed in the blockchain through smart contracts, which is fully in line with the definition of the DeFi project: for financial instruments running according to the blockchain, and there are many strengths to prove that DeFi will effectively increase the financial attributes of NFT artworks and the liquidity

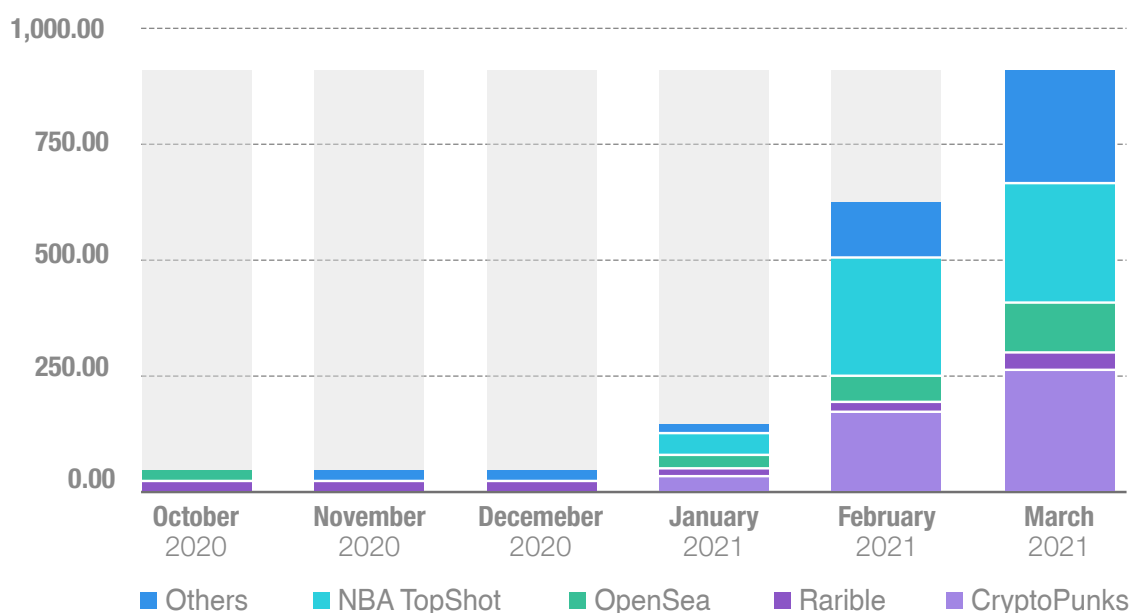
of encrypted artworks will also be further released.

For example, Mercurity.Finance allows users to obtain income through mining, loan, insurance, debentures, and synthetic assets. Artists can also create new digital assets on Mercurity.Finance. This not only gets through the boundaries between digital art and blockchain and opens up the door of encrypted art but also enriches the application scenarios and ecology of blockchain and flourishes the ecological economic system of DeFi+NFT.

Products such as Rarible and Aavegotchi are already innovative and diverse, but these are only part of many potential applications of these technologies. As mentioned above, the possibilities of combining DeFi and NFT are infinite

So far, it can be said that the theme of the first quarter of 2021 is all about NFT. In the first three months of this year alone, the transaction volume of this category exceeded US\$1.5 billion. Although this is only a small part compared with the DeFi ecosystem, the NFT market is growing rapidly at a ring growth rate of 2,627%. The biggest contributors are NBA Top Shot, CryptoPunks and OpenSea, accounting for 73% of the total transaction volume.

NFT Marketplaces volume comparison:strong growth,M USD










In the field of encryption, attempts and cases of combining DeFi and NFT are gradually increasing, but the high fuel price of Ethereum is still a problem for all vertical industries. Therefore, multiple DeFi, NFT and game DApps announced that they will be extended to other chains in order to increase the triggering of activity.

■ 1.2 Web3.0 Popular Art

The Web3.0 that people talk about today is actually derived from the concept proposed by Gavin Wood in 2014. Now everyone believes that Web3.0 has a complete protocol stack. Each part of these protocol stacks is characterized by decentralized and point-to-point protocol stack. It is a trustless transaction or collaboration infrastructure.

Various NFT DApps built based on open finance and smart contracts actually reflect the popular art trend of Web3.0. Artworks, collectibles and even physical assets in real world may become assets on the chain through tokenization to expand the extension of DeFi connecting the real world and boundary of the encryption world and truly affects our lives.

NFT Dapp Movement

Dapp	Dapp Image	L1/L2 solutions
OpenSea		Matic(Polygon)
Aavegotchi		Matic(Polygon)
Axie Infinity		Ronin
Somnium Space		Matic(Polygon)
Cryptovoxels		Matic(Polygon)
CryptoKitties		Flow
F1 Delta Time		Matic(Polygon)

The latest climax in the crypto space is changing the way we buy and sell goods in the digital field.

In 2017, two early NFTs, CryptoPunks and CryptoKitty that got popular earliest came out, triggering a tide of NFT collection. Today, more than 260 characters are traded weekly, with annual saleroom exceeding \$2 million.

Some blind boxes of cartoon cats, a video clip of LeBron dunking at high altitude, and a digital painting with a resolution of only 5,000 pixels will soon be auctioned at Christie's auction house. All these are irreplaceable tokens, or NFTs. This is an emerging digital artwork and method used in other media products.

These encrypted assets represent the latest fields based on the blockchain prosperity: the entire NFT market was valued at no more than 42 million US dollars three years ago. According to the latest estimate of Nonfungible.com which monitors the NFT market, the market value of NFT has increased by 705% by the end of 2020, reaching 338 million U.S. dollars, and it is expected that there will be more robust growth in the future.

■ 1.3 Origin of NFT Art Platform

● The dilemma of ETH

Since the CryptoKitties incident in 2017, smooth experience and GAS fees have become the fatal problem of Ethereum. Due to the low handling capacity in performance of the Ethereum public chain, slow speed and serious congestion and expensive formalities fee, the transaction cost is high. After the upsurge recedes, many DeFi participants will bear the loss of high handling fees.

● "Non" decentralized

Defiprime data shows that 30% of DeFi projects are deployed on Ethereum currently, while EOS, Tezos, and BSC only accounts for 8% of DeFi projects respectively.

Since most DeFi projects are developed based on ETH, other mainstream public blockchains and mainstream currency holders cannot participate at present. Strictly speaking, the centralization of Ethereum for DeFi violates Satoshi Nakamoto's concept of one vote for everyone.

● Short-termism lost continent

In many cases, DeFi tends to provide strong liquidity. It is higher than many people's expected return value, but from the perspective of lengthening cycle, they cannot provide continuous high value.

Value is the inner quality of a thing, and it becomes desirable to a certain extent. This value may be related to some tangible and intangible characteristics, especially the scarcity. Therefore, the economic value depends on its quality and scarcity. The value of NFT lies in not only itself, but also the value brought by NFT interaction to other fields, such as the practice of NFT in DeFi loan.

NFT represents unique and irreplaceable asset, and is highly secure in terms of cryptography. They cannot be exchanged with each other. Therefore, it brings scarcity to the encrypted digital world. Each of these tokens obtains value due to this scarcity. The occurrence of the situation is in line with the traditional law of supply and demand, and all parties are willing to pay more

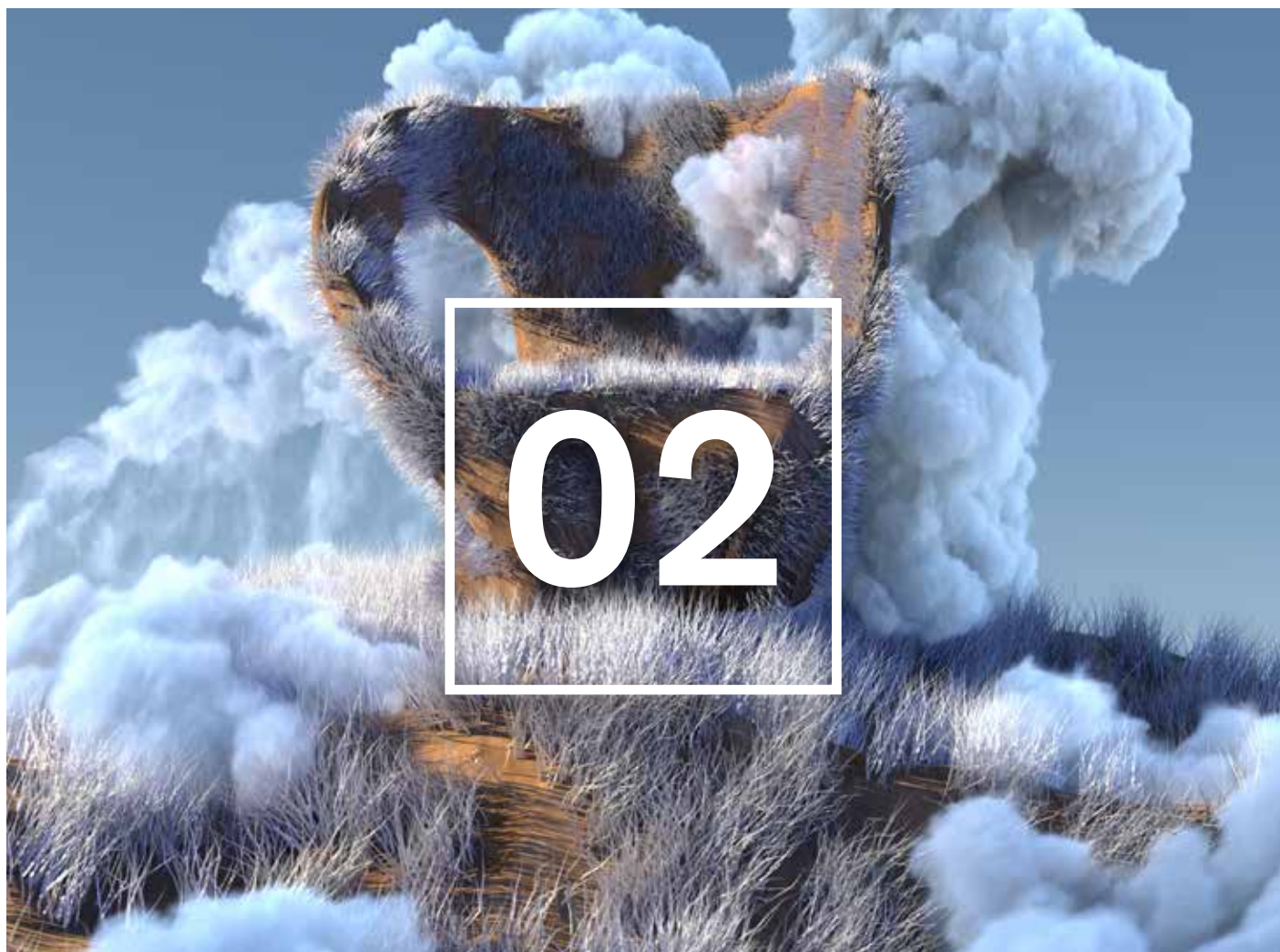
for specific and rare NFTs.

Therefore, NFT is most suitable for decentralized applications (dApps). Users can create and own unique digital projects, encrypted artworks, and collectibles, and conduct transactions on a platform that connects buyers and sellers.

If NFT's trading mode is gradually popularized in the art market, it will not only bring qualitative and quantitative changes to the industry, but also bring great revolution to the trading mode of the traditional art market that has not changed drastically for hundreds of years. The online transaction of an NFT encrypted artwork will no longer involve specific transportation, insurance and other links. It may complete multiple transactions and ownership transfers within a few minutes, which will subvert the traditional transaction mode and cycles.

As for the art itself, the application of NFT transaction mode may also change the ecological pattern of the entire artistic creation. Digital art, contemporary photography, digital illustration and other art forms that were difficult to form a broad market due to copyright issues in the past will gain wider development space.

We can find that many constructive solutions have begun to try to develop "antidote" to break the double bottleneck of traditional art and the DeFi world. This is also the original intention of the CryptoArt.Ai team to launch the NFT art platform with a non-homogeneous system.



II



Introduction to CryptoArt.Ai

■ 2.1 Platform overview

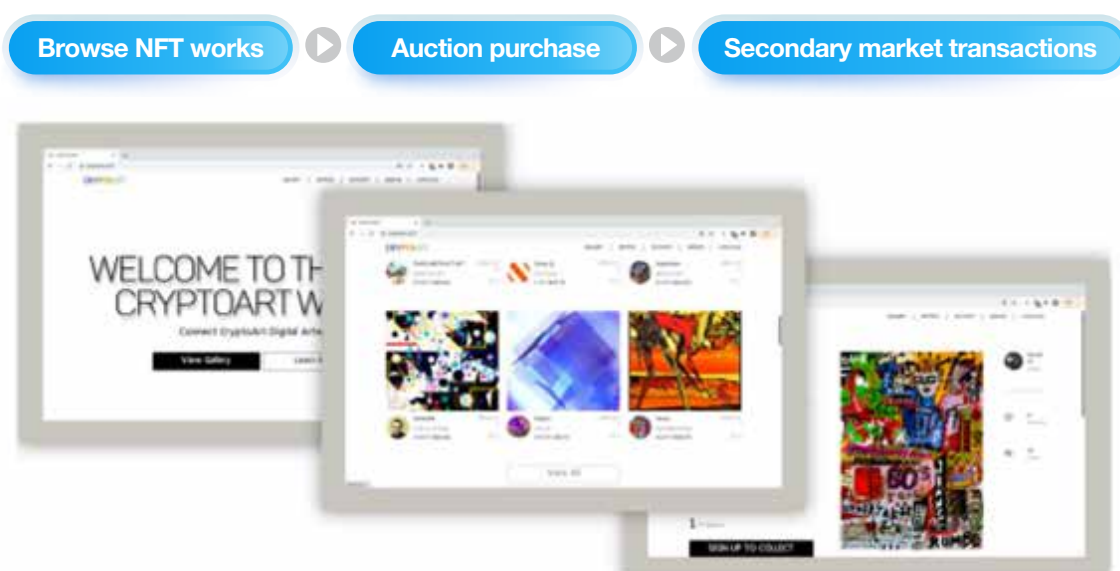
CryptoArt.AI is Asia's largest NFT platform for transaction of encrypted artworks. It allows any user to create and display their own works, and owns the ownership of the NFT. The platform integrates casting, sales, and collection of NFT encrypted artworks. More than 600 artists from more than 40 countries and regions have settled in the platform at present and the sold-out rate of works exceeds 60%.

On the CryptoArt.AI platform based on ERC-721 protocol, users can make bids to artists directly, or buy directly according to the bids. Artists can control the pricing model and can also give users NFTs.

All works of each creator are cast by the smart contracts of their own blockchain. Under this mechanism, any application in the ecosystem can be directly integrated with the contracts of individual artists without affecting the entire market pool. The new combination of artworks and auction mechanism innovates the traditional circulation mode of artworks so that the artworks can get rid of the intermediary and is traded with the smart contracts as an individual.

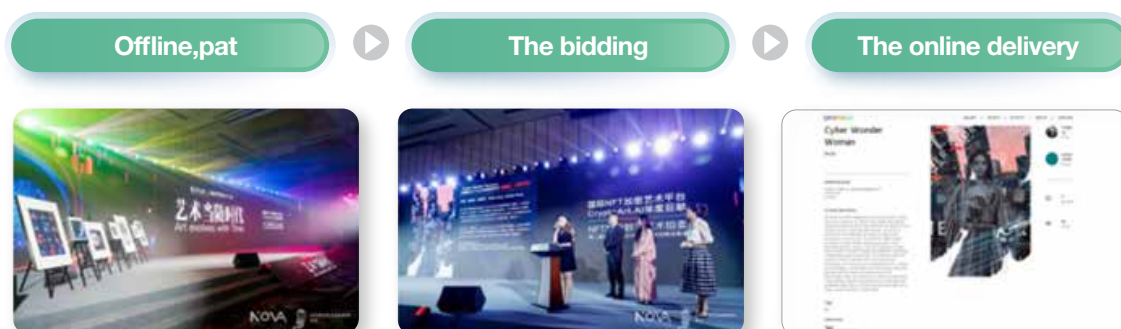
■ 2.2 Business mode

● The dilemma of ETH



● Online + offline linked auction

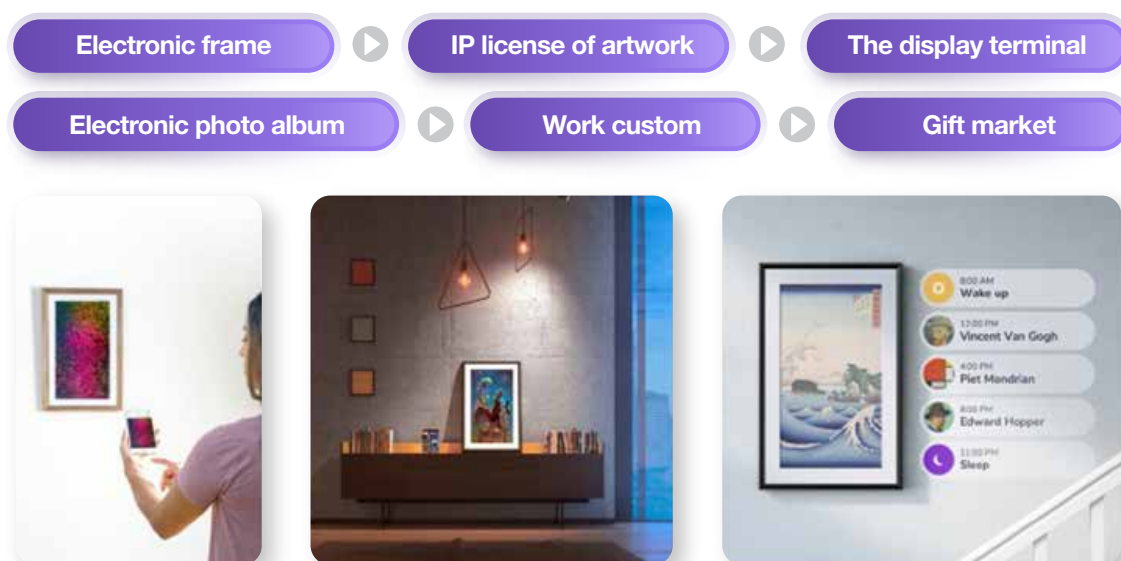
Since the CryptoKitties incident in 2017, smooth experience and GAS fees have become the fatal problem of Ethereum. Due to the low handling capacity in performance of the Ethereum public chain, slow speed and serious congestion and expensive formalities fee, the transaction cost is high. After the upsurge recedes, many DeFi participants will bear the loss of high handling fees.



December 22, 2020, Sanya,

CryptoArt.AI and Cointelegraph China conducted the first business auction on a banquet. Nine pieces of works from artists PAK and Song Ting set a domestic record of 169ETH. One of Park's single works was sold at a high price of 50ETH.

● Art derivative business



■ 2.3 Core Value

2.3.1 Focus on the field of art

Compared with OpenSea and other platforms covering digital artworks, encrypted collectibles, game items, virtual land, domain names and other subdivisions, CryptoArt.AI pays more attention to the development of encrypted artworks itself and derivative businesses. In the transactions on the CryptoArt.AI platform, NFT can not only be used as copyright and ownership for transactions, but also a unique link between the artist and the collector. NFT is the body of his work recognized by the artist.

2.3.2 Innovation mode of DeFi + NFT

CryptoArt.AI made innovation to combine dual mechanisms of DeFi (high liquidity) and NFT (high value capture), and promotes value circulation through flowing mining pools. Based on the reliable equity attributes of NFT and its unique and indivisible characteristics, the program can confirm the user's authority by identifying NFT, and NFT can also become a token for the ownership confirmation of the information world.

2.3.3 Activate the encryption market

NFT collectibles have a complete, transparent, reliable, low-cost and high-efficiency secondary market. Thanks to the data openness of the blockchain and the programmable asset attributes of the token, users can trade and transfer NFT collectibles conveniently on CryptoArt.AI and performed collectible auction with extremely low cost, which helps the market to be active. It is easier to realize the value discovery of collections in the active transaction circulation link.

■ 2.4 Participating artists

● PAK

The second most valuable encryption artist in the world, and retain the first place in Superrare saleroom. The works will be auctioned at Sotheby's in April.

● Song Ting

Graduated from the experimental class of the School of Arts and Sciences, Tsinghua University. served as the Education Director of the Blockchain Industry Research Center of Nanjing University of Aeronautics and Astronautics in 2020, and an art consultant for OPPO campus and Weibo scientific popularity.

● Suryanto

From Indonesia, one of the hottest graffiti encryption artists in recent times.

● Ramiro Alban

An artist from Ecuador, an animal rights activist and a dog lover, his works have been collected by Hollywood celebrities such as Orlando•Bloom, Lionel•Rich, Katy•Perry, Ryan•Seacrest, William•Shatner, etc

● IHSU YOON

The artist director from South Korea has created not only classic works for major brands such as Huawei, Mercedes-Benz and Samsung, but also many classic special effects for film companies such as Warner and Disney.



03

III



Technical framework

■ 3.1 Layer2 technology

The current public blockchain technology (Layer1 technology) has the problem of insufficient TPS performance and failure to meet the needs of large-scale transactions. With the progress of the construction of ETH2.0, Layer2 technology has attracted wide attention. As a platform for market perception and respecting user experience, CryptoArt.Ai team also discovered and captured the application value of Layer2 technology in encrypted art transactions and digital asset circulation.

The core method of the layer 2 capacity expansion of CryptoArt.Ai is to regard the underlying blockchain as a consensus basis, and use smart contracts or other means as a bridge between off-chain and on-chain communication. When fraud occurs, off-chain users can still return to the certain state of the chain. Only the calculation results are stored on the chain by Using the "Off-Chain" high-performance computing, so as to achieve high performance of the scalability.

3.1.1 Plasma Protocol

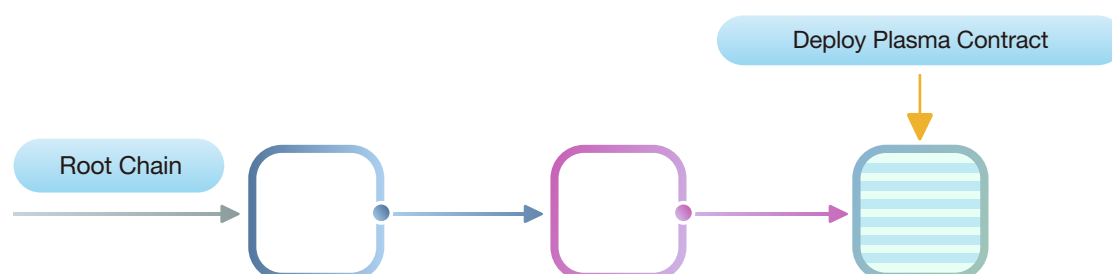
The idea of layer 2 capacity expansion was first used in the Lightning Network as one of the capacity expansion schemes of Bitcoin, and achieved good results. Similar to the Lightning Network, Plasma is the smart contract of a series of operation on the blockchain (For example, the Ethereum main chain). The main network contract only needs to process a very small number of commitments from the sub-blockchain, but it can perform an incredible amount of calculations in most cases, and promises are broadcast from the sub-chain to the main chain periodically.

Plasma is composed of two parts: ❶ Blockchain computing power similar to MapReduce distributed computing; ❷ Consensus of POS. Plasma is responsible for the requirements of distributing calculation, collecting and recording calculation results on the root chain. The calculation process is completed by POS consensus.

In the CryptoArt.Ai main chain, Plasma mainly adopts open source MVP system, and its implementation principle is roughly as follows:

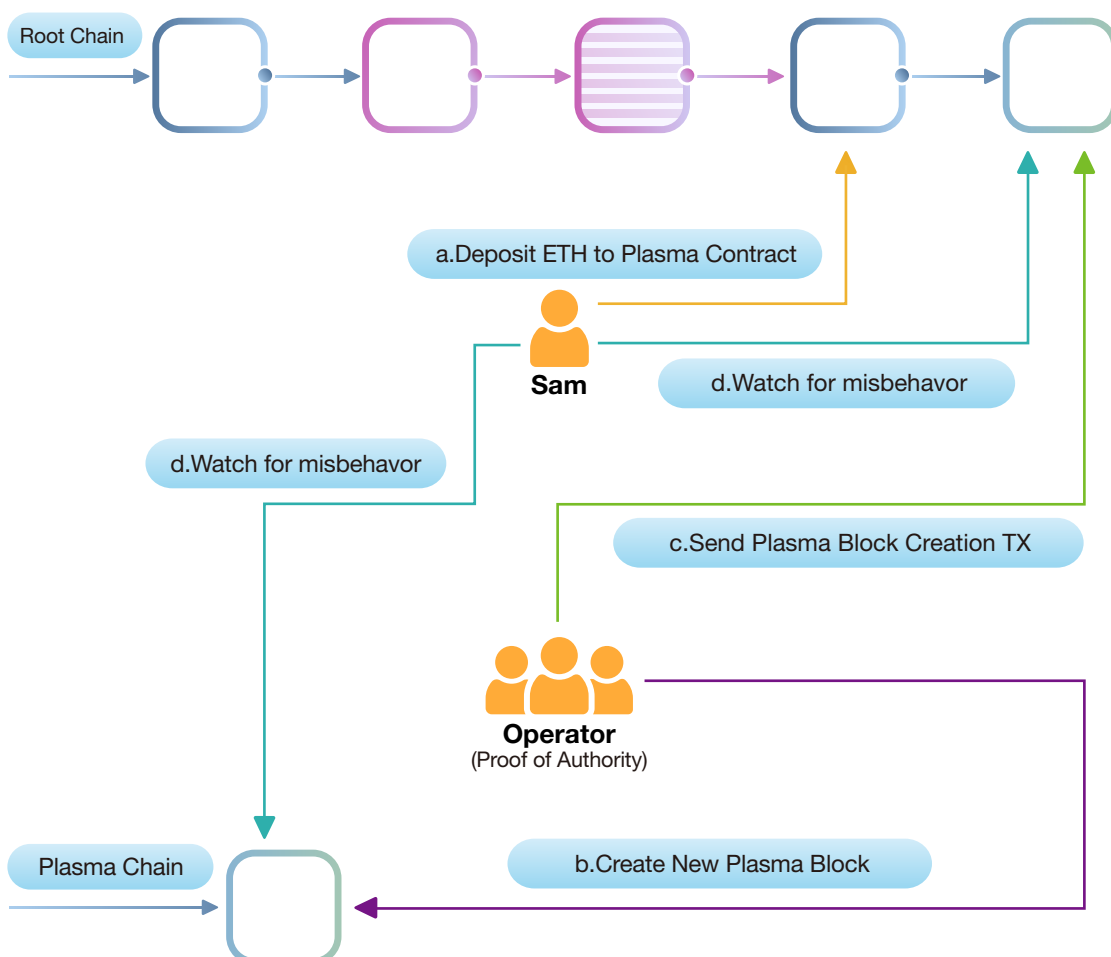
❶ Plasma smart contract is deployed on the root chain.

Plasma must deploy smart contracts on the root chain to complete the interaction between the main chain and the sub-chains.



② Fund initialization of the sub-chain

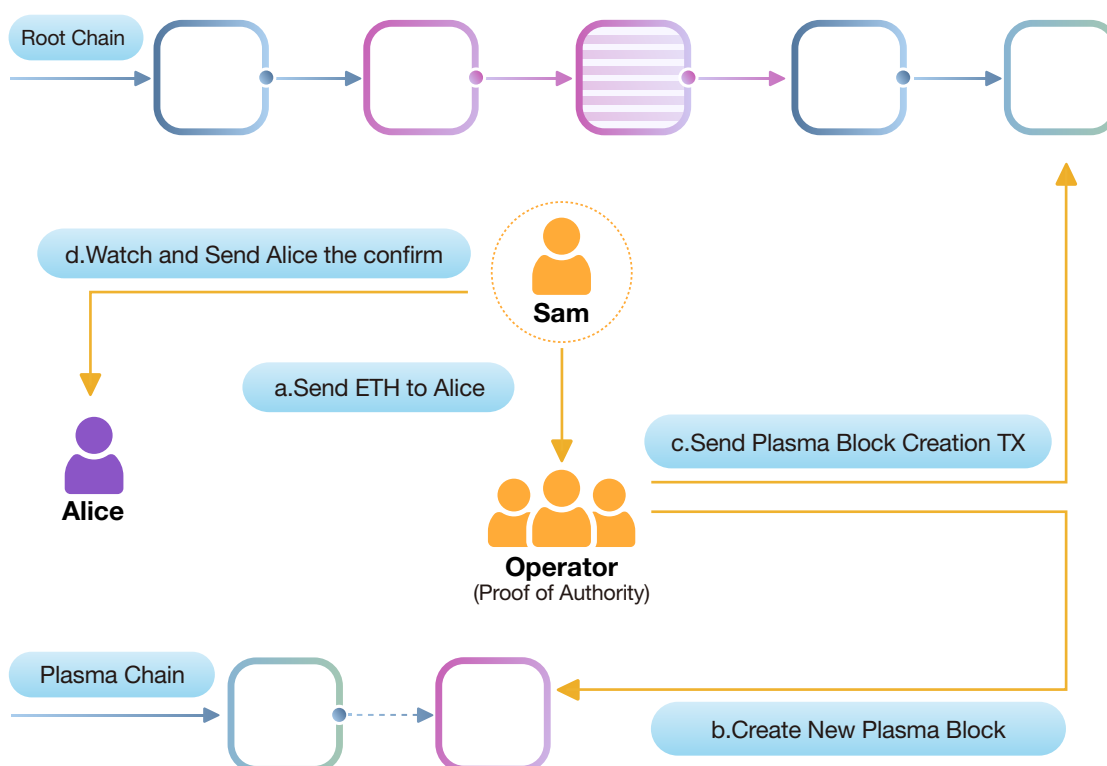
- 2.(a) User Sam transfers money to the Plasma smart contract as the funds of the sub-chain
- 2.(b) The operator of the sub-chain, after discovering the transaction of smart contract creates the corresponding fund transaction on the sub-chain. All transactions on the sub-chain adopt the "UTXO" model.
- 2.(c) After the transaction on the sub-chain is packaged to generate a block, the operator submits the verification information of the block to the Plasma smart contract.
- 2.(d) Sam checks all the operations of the Operator, and if there is a mistake operation, exit directly (it is relatively simple to implement the part of MVP. if the Operator makes a mistake, the user of the sub-chain can only choose to exit the sub-chain). The logic of exiting the sub-chain is described below.



③ Transfer of account through sub-chain

If Sam transfers money to Alice, the general steps are as follows:

- 3.(a) Sam informs Operator of the content of the specific transaction of transfer of account.
- 3.(b) The Operator packages the transactions to generate blocks.
- 3.(c) After the sub-chain transactions are packaged to generate a block, the Operator submits the verification information of the block to the Plasma smart contract.
- 3.(d) After the Operator finds that the verification information of the block has been submitted to the main chain, it will notify Alice to check.

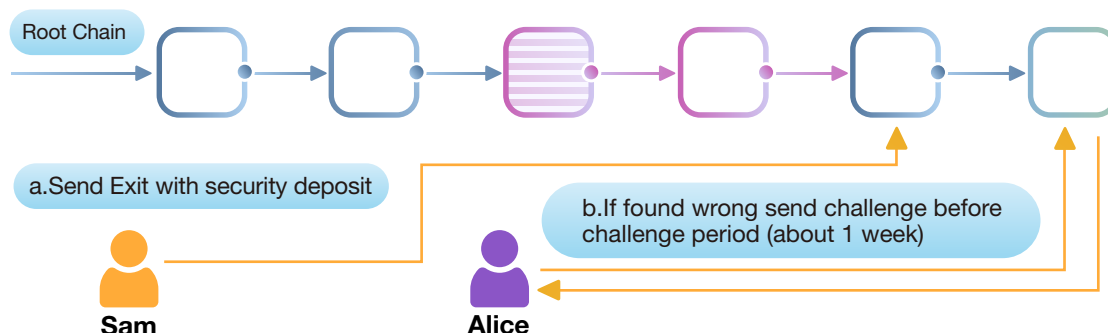


④ Exit of the sub-chain user

To exit from the sub-chain, you must apply to the Plasma smart contract. If the application is not challenged within one week, the exit is successful. Note that the funds in the sub-chain are all expressed in UTXO, and the proof information of the block can be used to prove that one UTXO is contained in one block.

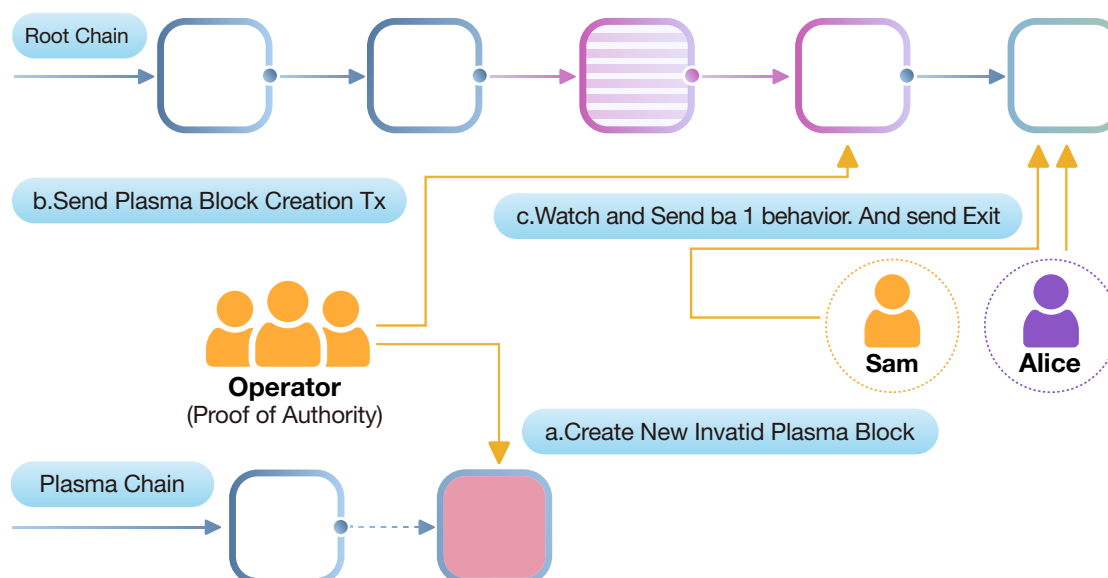
- 4.(a) Sam makes an exit request to the Plasma smart contract (provide the amount of the exit request and the security deposit paid to be challenged).
- 4.(b) If Alice finds that there is a problem with Sam's exit request, she submits evidence to the Plasma smart contract within one week.
- 4.(c) If the evidence is correct, Alice gets Sam's deposit. Sam failed to exit.

If the application for exit is successful, the Plasma smart contract will release the funds back to the main chain.



⑤ Operator submits wrong block proof.

When the user of the sub-chain finds that the operator submits the wrong block proof information, they request to exit from Plasma. If the Operator also makes a request for exit, it cannot be implemented unless other exit requests are completed.



■ 3.2 Innovative consensus algorithm

A stable and effective block generation mechanism is the cornerstone of the CryptoArt.Ai blockchain ecology. Under the premise of reducing resource waste, consuming less learning costs, and not losing the decentralized characteristics of the blockchain, CryptoArt.Ai proposes a type of universal consensus algorithm. It is a hybrid consensus algorithm of "POS (Proof of contribution) + PBFT (Proof of Passing Message)" and not only allows users to actively participate but also prevents malicious behavior. It is more expectable than POS consensus mechanism that will be

adopted by Ethereum in the future because the latter may tend to cause distrust among network nodes.

3.2.1 POS consensus mechanism

POS (Proof of Stake) is improved mainly for the shortcoming of the POW algorithm and tries to solve the situation where a lot of resources are wasted in the POW mechanism. This mechanism determines the right to bookkeeping by calculating the percentage of held coins in the total number of coins, including the time of possession of the number of coins.

POS requires participants to deposit some token (interests) on the blockchain in advance, similar to depositing property in a bank. This mode will allocate corresponding interest based on the amount and time of holding digital currency. Only when the user puts some benefits (deposit) into it, they will pay more attention to it and make more rational decisions. At the same time, a reward and punishment mechanism can be introduced to make the operation of the node more controllable and better prevent attacks at the same time.

In the POW mechanism, it often takes a lot of power and time costs to find an eligible nonce value. In order to avoid the waste, CryptoArt.Ai adopts a faster algorithm based on the POS mechanism:

$$\text{SHA256}(\text{SHA256}(\text{Bprev}), \text{A}, t) \leq \text{balance}(\text{A})^m$$

Where, H is a hash function; t is UTC timestamp; Bprev refers to the previous block; balance(A) represents the balance of account A.

The only parameter that can be adjusted continuously is t. The m at the right side of the equation is a fixed real number. Therefore, the larger the balance (A) is, the greater the probability of finding a reasonable t is. In the network, the range of t is generally limited. For example, the triable time cannot exceed 1 hour over the standard timestamp, that is, a node can try 7,200 times to find an eligible t. This means that the more token balance in an account is, the easier it is to find the next block under the same computing power.

In addition, The POS algorithm of CryptoArt.Ai still retains the coin age mechanism in Ethereum. The calculation consensus is proofhash <coin age x target value as expanded as follows:

$$\text{hash}(\text{nStakeModifier} + \text{txPrev.block.nTime} + \text{txPrev.offset} + \text{txPrev.nTime} + \text{txPrev.vout.n} + \text{nTime}) < \text{bnTarget} \times \text{bnCoinDayWeight}$$

The coin age is bnCoinDayWeight, which is the product of coins held multiplied by the number of days of possession of coin. The maximum number of days here is 90 days.

The target value, bnTarget, is used to measure the difficulty of POS mining. The target value is inversely proportional to the difficulty. The larger the target value is, the lower the difficulty is; and vice versa.

The proofhash corresponds to the hash value of a set of data, namely $\text{hash}(\text{nStakeModifier} + \text{txPrev.block.nTime} + \text{txPrev.offset} + \text{txPrev.nTime} + \text{txPrev.vout.n} + \text{nTime})$.

It can be seen from the formula that each node proves that it is eligible for bookkeeping through the coin age. The greater the quantity and number of days of the held coin is, the greater the chance of mining the block is. For example, suppose you hold 100 CART in your account for 10 days, then your coin age = $100 * 10 = 1000$. At this time, your probability of obtaining the right to bookkeeping is 10 times than that of the 100 coin age node.

The coin age is the value of the constant number of coins held in the corresponding account. If the number of coins held in the account changes, the coin age will also be reset to zero, and the timing will be restarted. The generation of blocks is determined by the coin age, and it is no longer necessary to compete for the computing power. This method is more environmentally friendly, and can save a lot of resources compared with the POW computing power.

3.2.2 PBFT algorithm

BFT (Byzantine Fault Tolerance) is a fault-tolerant technology in the field of distributed computing. Byzantine fault tolerance comes from the Byzantine Generals problem. PBFT (Practical Byzantine Fault Tolerance) was proposed in the paper "Practical Byzantine Fault Tolerance and Proactive Recovery" published by Miguel Castro and Barbara Liskov in 1999.

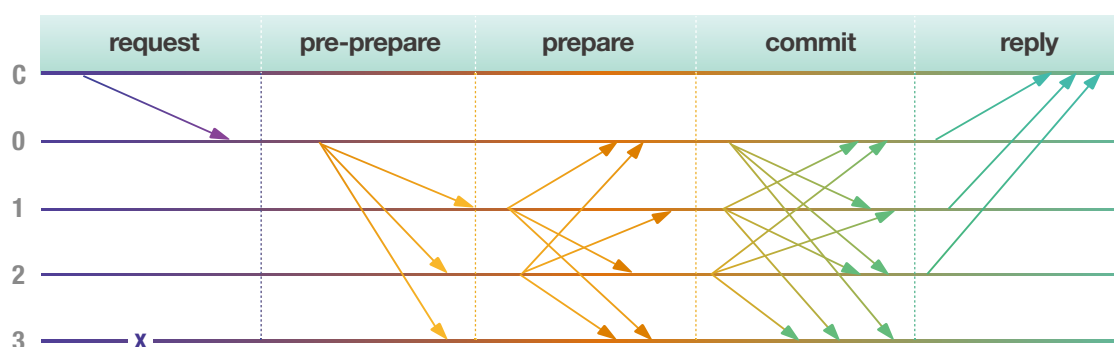
The PBFT algorithm can work in an asynchronous environment, and it solves the problem of low efficiency of the original Byzantine fault-tolerant algorithm through optimization, and reduces the algorithm complexity from exponential order to polynomial order, making the Byzantine fault-tolerant algorithm feasible in actual system applications. It has been widely used at present. The PBFT algorithm can guarantee both Safety and Liveness when the number of failure nodes does not exceed 1/3 of the total. The PBFT algorithm uses cryptography-related technologies (RSA signature algorithm, message verification code and digest) to ensure that the message transmission process cannot be tampered or destroyed.

PBFT is replica replication algorithm of a state machine, that is, the service is modeled as a state machine, and the state machine conducts replica replication at different nodes in a distributed system. Each copy of the state machine saves the state of the service and also implements the operation of the service. The set consisting of all the copies is represented by a capital letter R , and each copy is represented by an integer from 0 to $|R|-1$. For the convenience of description, it is usually assumed that the number of failed nodes is f , and the total number of service nodes is $|R|=3f+1$, and f is the maximum number of replicas that may fail. Although there can be more than $3f+1$ replicas, the additional replicas cannot improve reliability other than reducing performance.

All replicas operate in a rotation process called View. In a certain view, one replica is used as

the primary, and the other replica nodes are used as backups. Views are integers with consecutive number. The primary is calculated by the formula $p = v \bmod IRI$, where v is the view number, p is the replica number, and IRI is the number of replica sets. When the primary fails, the view rotation process needs to be started.

The realization process of PBFT algorithm is as follows:



Among them, C is the end sending request, 0123 is the server end, and 3 is the down server end. The specific steps are as follows:

- ❶ Request: requester end C to send a request to any node, here is 0
- ❷ Pre-Prepare: Server 0 broadcasts after receiving C's request, and spreads to 123
- ❸ Prepare: 123, record and broadcast again after receiving, 1->023, 2->013, 3 means it cannot broadcast because of the downtime.
- ❹ Commit: when 0123 node is at the Prepare stage, if it receives more than a certain number of the same request, it will enter the Commit stage and broadcast the Commit request.
- ❺ Reply: when 0123 node is at the Commit stage, if it receives more than a certain number of the same request, it will give feedback to C

Byzantine fault tolerance can accommodate the error of nearly one-third of node errors. Hyper-ledger created by IBM used this algorithm as a consensus algorithm.

The PBFT algorithm has high transaction throughput and handling capacity, high availability, and is easy to understand. However, the number of nodes is fixed, and the node identity is determined in advance, and cannot be added or deleted dynamically. It can only be applied to the consortium chain or private chain scenario with a fixed number of nodes.

PBFT has applications in many scenarios. In blockchain scenarios, it is generally suitable for private chains and consortium chains that require strong consistency. CryptoArt.Ai applies it in public chain by combining with the POS algorithm and solve the Byzantine fault tolerance problem in an untrusted network.

PBFT is essentially to improve the ability of a system to resist pressure and risk of the entire POS consensus. Based on the practical Byzantine consensus, it allows the entire network to operate steadily under the condition that the entire network loses some nodes or some nodes are dishonest or evil, or are disconnected, or downtime, which improves the performance of pure POS consensus.

On-chain transactions of the Bitcoin require six blocks to confirm to achieve block irreversibility. If a miner wants to reverse the six blocks and rewrite all transactions, it will cost a lot of computing power; in contrast, in the PBFT+POS hybrid mechanism of CryptoArt.Ai, the generation of a new block requires multiple rounds of voting by the majority of people to reach a consensus, and malicious nodes that want to reverse the block will be deducted from the deposit and control most of the voting rights. This is not in line with the blockchain logic. So theoretically the new block has final certainty.

■ 3.3 Flexible cross-chain mechanism

Now everyone thinks that Web3.0 has a complete protocol stack. Each part of these protocol stacks is characterized by a decentralized, peer-to-peer encryption protocol. It is an infrastructure for trustless transactions or collaboration.

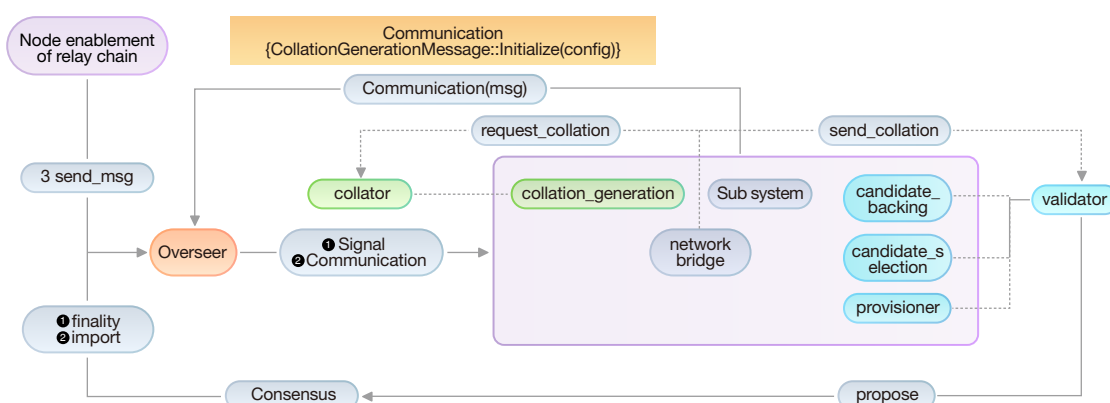
Web3.0 is also known as the "post-Snowden" era. It contains four components: static content publishing, dynamic messages, trustless transactions, and integrated user interfaces. This corresponds to three goals of Web3.0 proposed by Gavin Wood: each Internet user should be able to control his own assets, identity and data.

From this perspective, with the support of blockchain technology, we already have a lot of infrastructure points to connect Web2.0 to Web3.0 in the face of Web3.0, including but not limited to: decentralized, encrypted information release system.

In the Web 3.0 era, CryptoArt.Ai is also committed to adopting the important construction methods of blockchain and creating a special flexible cross-chain mechanism. It is like Polkadot to solve the two major obstacles to the spread and acceptance of blockchain technology: instant scalability and extensibility.

CryptoArt.Ai has achieved a universal flexible cross-chain mechanism by using a series of targeted collaborative smart contracts, as well as asynchronous communication, state machine and hash locking technology to break the communication bottleneck of each blockchain system, and let various digital Asset interconnect mutually. The appropriate cross-chain coordination mechanisms effectively ensure the effective and reliable transfer of consensus and value between internal parallel chains and other public chains.

This set of flexible cross-chain technology includes two parts: one is the interconnection between CryptoArt.AI and external chains. CryptoArt.AI and other chains are implemented through relay technology to complete the interaction with other chains. Another is the intercommunication between other chains based on the CryptoArt.AI platform. CryptoArt.AI also provides a more complex smart contract to support the interconnection between other chains. Since it supports two different types of other chains, the smart contract combines with the relay chain to complete the interconnection among different types of chains.



CryptoArt.AI is based on Notary and relay technology, adopts a design mode of multi-chain fusion, and uses practical Byzantine and POS consensus protocols to establish its own technical route. It treats all other blockchains as parallel chains, in order to transfer the tokens on the original chain to the original chain address similar to multi-signature control through the relay-chain technology, temporarily locking is conducted for it. The result of the transaction on the relay chain will be decided by these signatories to vote whether it will take effect.

Parallel chain (chains that can be parallelized) is a simpler form of blockchain, and a hub hall responsible for recording, transmission, and security. It is attached to the security provided by the "relay chain" instead of providing safety by itself.. It is called a relay chain because it can not only provide security for parallel chains, but also ensure that messages can be safely transmitted among them.

Cross-chain transactions are trustless messages among blockchain networks. This is a key infrastructure component for inter-link communication. Cross-chain transactions are initially created on the source blockchains, and then processed and forwarded through bridges and connection networks before finally reaching the target blockchain.

This innovative design of CryptoArt.AI solves the problem of matching the generation speed of different chain blocks for cross-chain transactions. According to the block generation speed of the chain, the chain is divided into different layers, and then a proprietary adaptation chain or module is provided for each layer to drive cross-chain transactions at the same layer.

■ 3.4 NFT design

The CryptoArt.Ai team believes that NFT is just like the blind box that everyone likes to collect. Although the dolls in the blind box may be the same size, the value of a doll that cannot be drawn should be greater than the dolls that have been drawn for you, me or him, there are differences in the value of the dolls as a result. This is where the non-homogeneity of the encrypted art ecology lies.

The NFT issued based on ERC-721 protocol has high-quality attributes such as uniqueness, indivisibility, and non-tamperability, which makes NFT more suitable for benchmarking assets in the real world and is widely used to prove the ownership of digital assets.

3.4.1 CART Finance

CART Finance is the first NFT collectibles platform based on ERC721 and ERC1155 in the CryptoArt.Ai ecosystem, and is a project that allows users to gamify their DEFI experience. With the help of various token mechanics and various game mechanics, Cart Finance is able to make a lot of benefit for users.

Cart Finance has three attributes that determine its overall value in the ecosystem -- that is appreciation, idiosyncrasy, and co-branding. One of the main features of the project is "rare mining". It is a novel game mechanic introduced in CART Finance, designed to encourage and reward thoughtful players and active participation. Players will get rarer NFT collectibles by pledging CART.

- **a** Editable properties. Secondary creation may be made for their own NFT to form the artworks with their own unique style;
- **b** Social attributes. You can post your artworks on Twitter, circulate your artworks on social platforms, share your collection on social platforms;
- **c** Financial attributes. As the artistic value and monetary value of NFT increases, it cooperates with the financial lending platform to realize the auction of artworks and trading of financial lending. Users can pledge stable tokens through the contract after NFT and invest them in the lending market to conduct lending activities of tokens.

First of all, in CryptoArt.Ai, we need to Mint for the encrypted artwork or digital items. In this way, a photo, a piece of electronic music, and a mobile video become a digital asset, and its ownership is recorded on the blockchain and can be owned, stored and even traced back, and its past transaction records are all open and transparent, and cannot be tampered with.

It is like that a famous paintings can be printed as cheap posters for distribution, digital items

that are not on the chain can be copied and shared unlimitedly, but for works that have been put on the chain, the original digital product is marked as a native digital asset. Although anyone can obtain a digital copy of it, there are only a limited number of NFT versions of this work. When you pay to buy NFT, you get the right to transfer this token to your digital wallet.

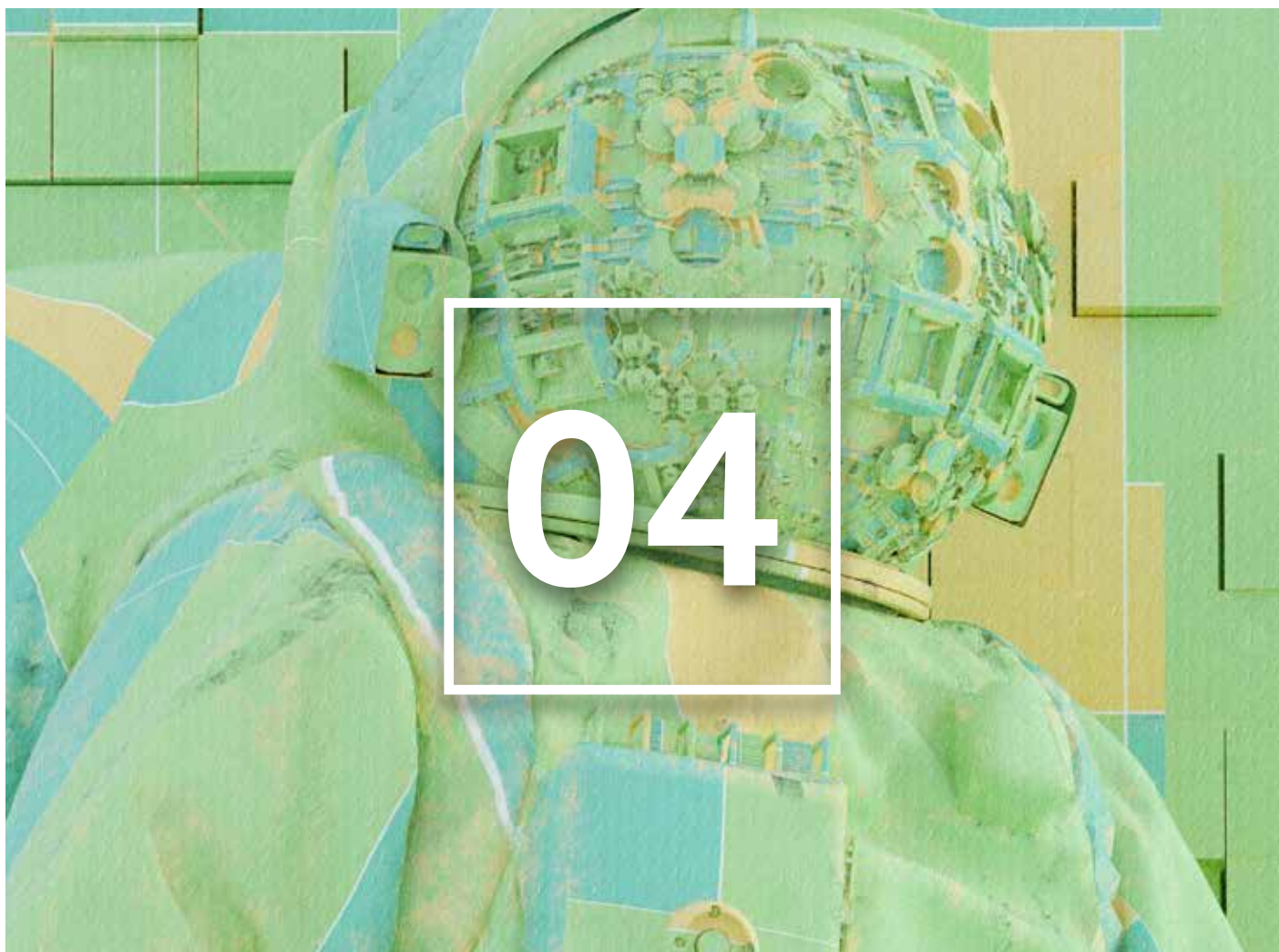
By applying the core design framework of NFT, CryptoArt.Ai will greatly change the power structure of existing content creators, middlemen and buyers/collectors, because the ownership certification of this digital product is fundamentally decentralized and independent of the centralized service or centralized library.

3.4.2 Virtual Art Gallery

- Ⓐ Persistence. That is, it never "resets," "pauses," or "ends," but only lasts indefinitely.
- Ⓑ Stay synchronized and real time. Even if prearranged and isolated events happen like in "real life," it will still be a living experience that exists in real time, and everyone exists in real time.
- Ⓒ There are no real restrictions on concurrent participation with a personal "sense of presence". Everyone can be a part of and participate in a particular event/place/activity with a single institution at the same time.
- Ⓓ To become a closed-loop economy entity. Individuals and enterprises will be able to create, own, invest in, sell and get return for a wide range of "work". These "work" produces "value" recognized by others.
- Ⓔ Experiences that span the digital and physical worlds, private and public networks/experiences, and open and closed platforms.
- Ⓕ Provide unprecedented interoperability of data, digital items/assets, content and so on in all of these experiences.

In the future, with the widespread use of CryptoArt.Ai, content creators will no longer need to obtain commissions from the platform, and they will retain almost all the proceeds from the sale of works on the blockchain. Secondly, for buyers of works, in the context of the contemporary art market, CryptoArt.Ai also provides opportunities for free resale of works in the secondary market, and this process does not require any platform intermediary or even the artist's verification. No need to worry about the authenticity of the work.

This shows that artists and buyers are actually the biggest beneficiaries of CryptoArt.Ai. An author who produces high-quality content can get paid quickly by reselling the copyright of his own work, and a discerning buyer can also buy favorite digital products at a much lower price than in the secondary market.



IV

Token Economic Model

4.1 Token Introduction

- **Token name:** CryptoArt.Ai
- **Token abbreviation:** CART
- **Total issuance:** 100,000,000 pieces
- **Token type:** ERC-20
- **Token accuracy:** 18

CART is the ecological token of the CryptoArt.Ai platform and has the dual attributes of platform coin + authority token. Users make lock position for CART and obtain NFT encrypted artworks of different levels according to the weighted average of the duration and quantity. Realization can be obtained through free transfer of NFT, and CART will never be inflated. The user consumes CART and pushes the NFT artwork he holds to the hot page of DAPP, and CART realizes deflation. Part of the platform's revenue is used to repurchase and destroy CART, further reducing the total amount of CART and gradually becoming a scarce asset.

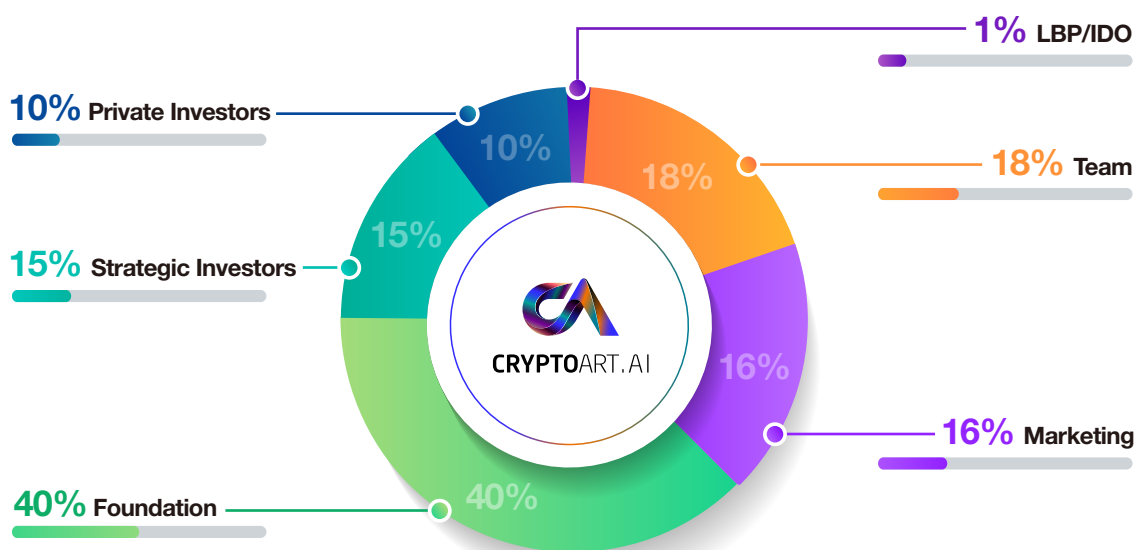
The application scenarios of CART mainly include:

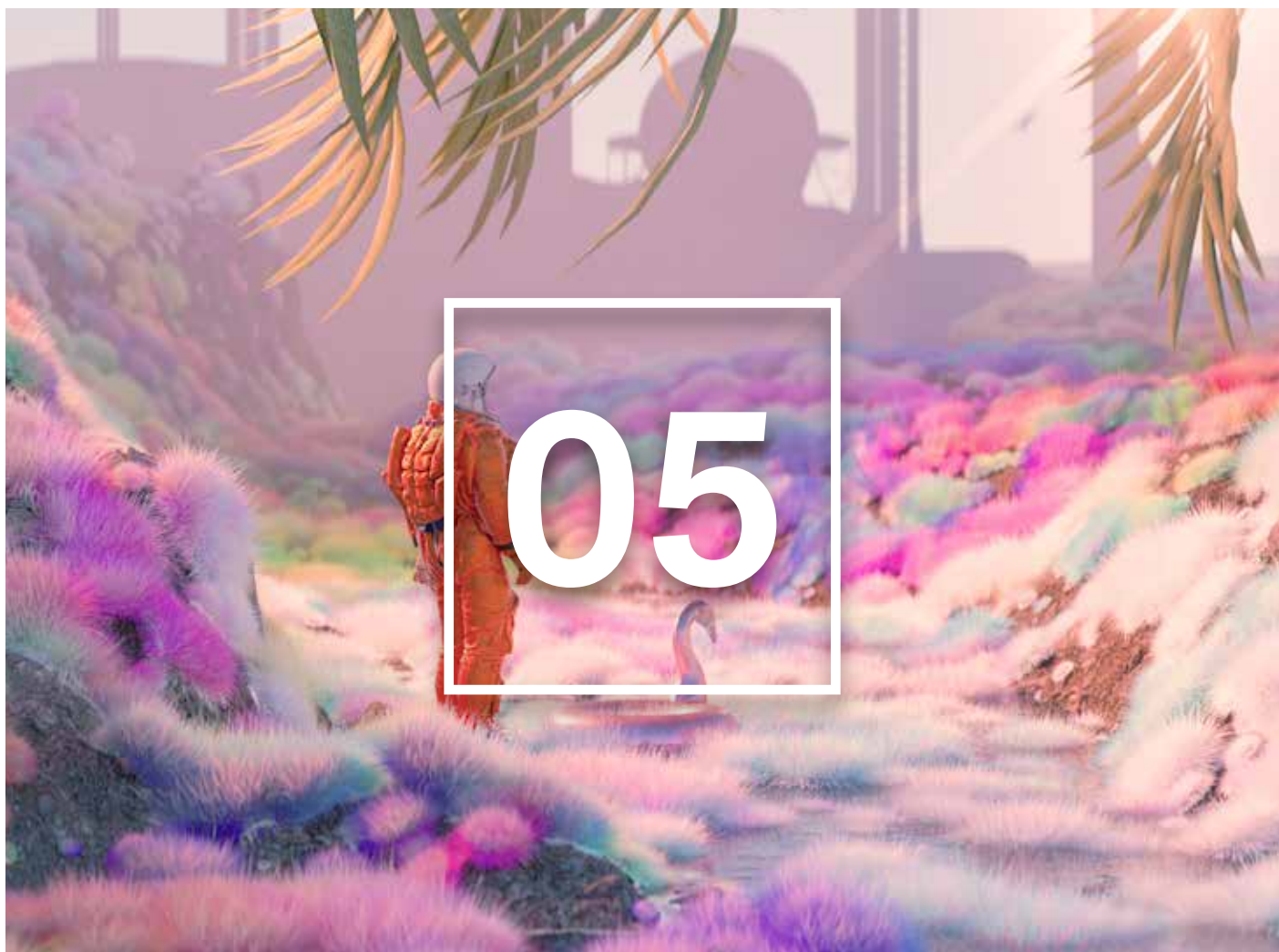
- ① Partial repurchase of trading commissions of the platform
- ② Community DAO governance
- ③ DeFi plus NFT products
- ④ Staking gets NFT
- ⑤ Pay to obtain priority stick authorization and other permissions, and more rights will be unlocked gradually

4.2 Distribution plan

The CART distribution plan is as follows:

Token Allocations	Percentage	Quantity	Evaluation (USD)	Token generation activities	Period of authorization
Strategic Investors	15%	15,000,000	8 Million	1,500,000	Unlock by quarter within one year.
Private Investors	10%	10,000,000	12 Million	1,500,000	Unlock by quarter within one year
LBP/IDO	1%	1,000,000	20 Million	1,000,000	No locked position
Team	18%	18,000,000		0	Locked position for one year and unlock for 2 years.
Marketing	16%	16,000,000		1,600,000	Quarterly unlocking over 2 years
Foundation	40%	40,000,000		0	Locked position for 2 years
Total	100%	100,000,000		5,600,000	



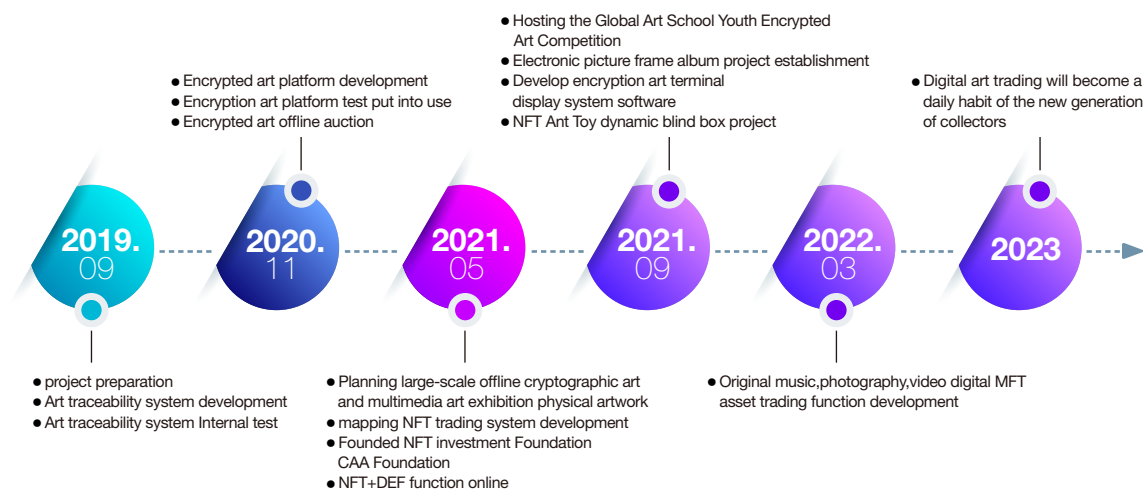


V



Road Map

■ 5.1 Platform milestones



■ 5.2 Key product planning

① CryptoArt.Ai, a crypto art trading platform

In the future, art vertical sections such as music, movies, photography, blind boxes, etc will be added, and functions such as countdown auctions and auction incentives will be launched to enhance the activity of the primary and secondary markets. At the same time, product iterations will be carried out to optimize the trading experience.

② Encrypted artwork NFT combined with DeFi

We plan to launch the Dapp online that is innovative design of DeFi + NFT in May 2021. Through the lock-up platform Token CART, we will use the blind box method to obtain NFT artworks according to the lock-up quantity and time. At the same time, you can consume CART to Put your works at the top of the Dapp, so that more people can see your works, which is convenient for resale in the secondary market. In addition, we will also jointly conduct DeFi liquidity mining with multiple projects, and collaborate with multiple encrypted communities to create joint NFT works.

③ NFT Investment Foundation --- CAA Foundation

This is an exponential type investment fund for encrypted arts of for mainstream digital currencies. Based on on-chain data analysis and comprehensive market research and judgment, it continuously invests in high-quality encrypted art and encrypted artists, fully operates its own encrypted art assets, and brings the expected income and industry status to the fund investor.

④ Encrypted Art Studio --- CAA Studio

The studio provides the creation and services of encrypted art derivatives to solve the needs of enterprises in the industry for NFT generation (case: all NFT gifts in the activities held in Sanya of COINTEL EGRAPH 2020), visual creativity of daily encrypted art exhibition auction, etc. In

order to promote artistic integration and exchanges, we will also conduct joint creations with various popular IPs, fashion brands, vogue brands, and luxury brands and carry out irregular offline activities.

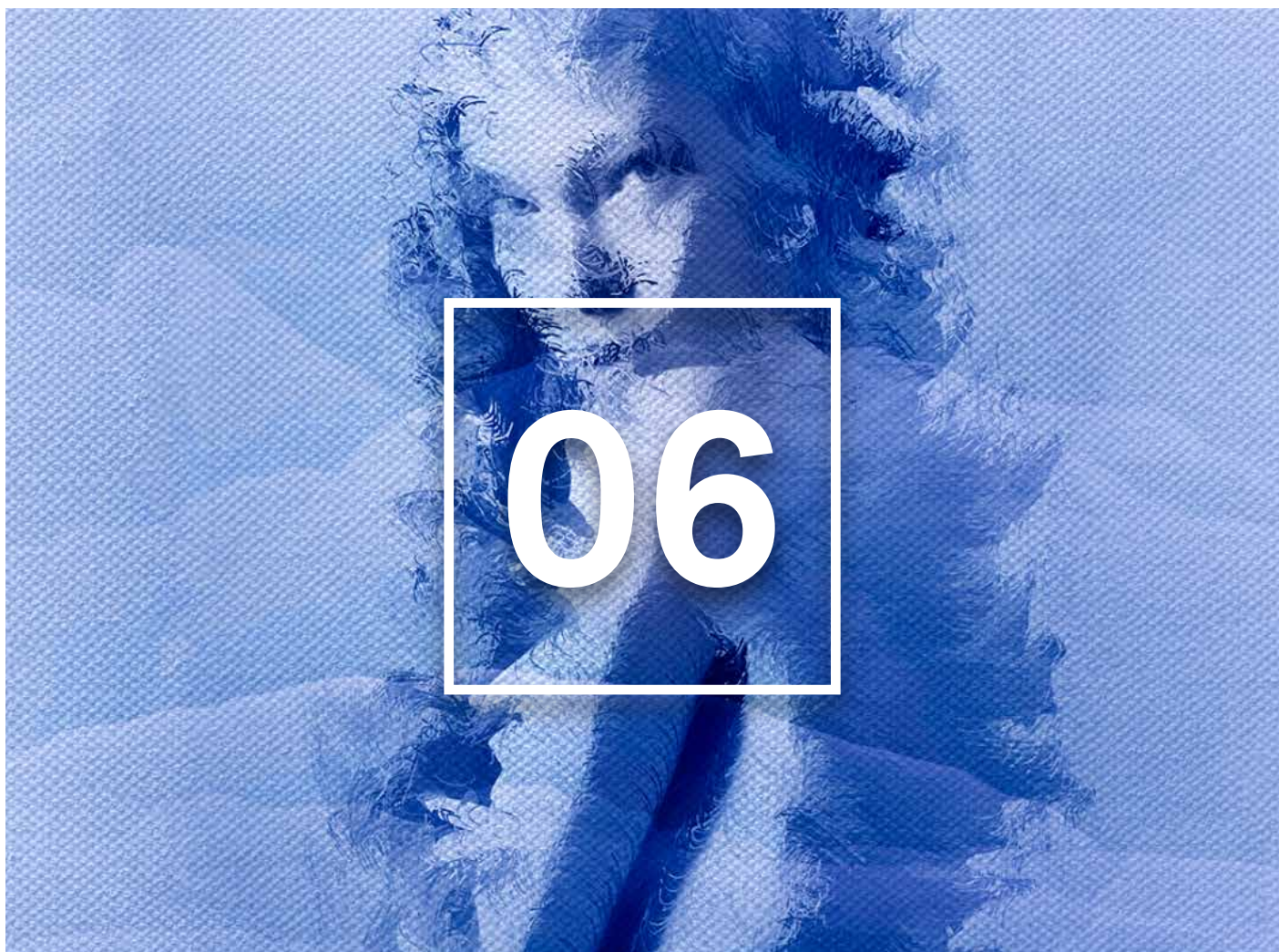
⑤ Terminal display equipment---CAA Display and IP authorization

We have never stopped at the hardware level. We made research and development of terminal electronic picture frames to provide end users with display equipment for displaying encrypted artworks. We carried out research and development for small electronic photo frames and target the young consumer market, and cooperate with mature ARTTOY studio to launch NFT dynamic blind boxes.

When the number of end users is sufficient, we will open up IP authorization. For example, 10 million terminals can provide copyright to display authorization services for works. If one Yuan is charged for a piece of works, that is 10 million Yuan.

⑥ Encrypted gallery and offline auction--- CAA Gallery

Offline encrypted art exhibitions, including annual exhibitions and short-term temporary exhibitions in some venues (case: \$Whale & CryptoArt .ai "Nirvana Rebirth" Encrypted Art Joint Exhibition at Wuhan Blockchain Conference). At the same time, the exhibition and auction are combined to carry out offline promotion for key artists (Case: CTC x CryptoArt.Ai "Art follows the Time" exhibition held in Sanya in December 2020).



VI



Appendix



■ 6.1 Major Events of CryptoArt.Ai

- ❶ On October 30, 2020, "CryptoArt.Ai" won the first prize of the Digital Economy Blockchain in the Yangtze River Delta International Innovation Challenge of the Global Technology Transfer Conference.
- ❷ On November 6, 2020, the co-founder of CryptoArt.Ai accepted an interview with Oriental Finance Channel.
- ❸ On December 22, 2020, CryptoArt.Ai and Cointelegraph China held the business auction on a banquet for the first time in Sanya. 9 pieces of works created by artists PAK and Song Ting set a domestic record of 16 ETH. Among them, a single piece of PAK was auctioned at a high price of 50ETH.

■ 6.2 Future Vision

From the beginning of the establishment, CryptoArt.Ai has been open to everyone in the world and is available for all encrypted art lovers. CryptoArt.Ai is committed to creating an asset-light digital art platform in the pocket that is available to everyone, allowing more people to participate in the wave of Crypto cultural revival in-depth with a low threshold, and become a mass-level entrance to the world of encrypted art.

In the future, CryptoArt.Ai will launch artist alliances and collector organizations, adhere to the people-oriented principle to promote the process of distributed business, and carry out a wide range of encryption/digital art education activities in conjunction with the global market, and use the power of encryption art and decentralization to make continuous contribution to the progress of the world and eventually become the world's largest and most trusted trading platform for encrypted artworks.