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驚木密為 芝草識 仙人白雲茅
曉流水 千古洞春 數卷南華
却萬株松 關身
登山四望 除 蕪水遠 天涯松雲深
公樹 暮 露 肘 慶 前 振
科 頭 林 下 新 紫 芝 滿 地 無 心 采
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RCCC

Art Data Platform Offering the Record of Origin,
Assessment, Collection and Trade information
on Blockchain.

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such as dead loop, the error, the loophole, the crash, the rollback or the hard bifurcation and so on;

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Project Overview

The Booming Art Market



The global data center has developed rapidly with great potential. However, the traditional transaction payment model will not be suitable for global trade in the future. There exists enormous challenges in multi-party cooperation, trade and financing, risk management, privacy, transaction speed. For Arts market, the safety and speed of transactions are more crucial. There are entry barriers in the Arts market. The buyers have a lack of trust in the authenticity and condition of art assets. Trust cannot be established without information – the trusted record of origin, ownership and authenticity. Therefore, for Arts market, a new system is required for the provenance of origin, ownership and authenticity to help buyers stay away from risks and gain profit. The RCCC Arts Data Platform was born for solve the problems above. identification data center came into being. With the unique traceability system of the blockchain, it completed the appraisal and evaluation of the collection and provided a safe, efficient, and authentic data center for art collectors.

Background Overview

In the past two decades, with the rapid spread of the Internet, almost every industry changed their business mode – the only exception is Art. This disruption has radically altered the economics of the entertainment, travel, retail, media and publishing, commercial real estate, transportation and food industries, etc. Amazon alone, for example, accounted for a significant proportion of the total U.S. retail trade in 2016. However, questions regarding adoption of art e-commerce remain - how, when, and in what manner will this transformation take place in the art industry? Why is the art market impervious to the penetration of commerce conversion? Why ordinary people are reluctant to purchase Art with ease online like other goods and services??

It would be incorrect to say that no honest attempt was made to bring Art Commerce into the mainstream by using the Internet. Initial attempts were made by Sotheby's, Amazon, and eBay. In January 1999, Sotheby's announced a \$25 million plan to create a dedicated online Art marketplace - intended to create the first online art trading mall.

At the heart of its initial strategy was a plan to sign up over 5,000 secondary market dealers, nearly all of their clients, to provide inventory for sale on a dedicated Sotheby's online site that was separate from its live auction business. Sotheby's online venture was the boldest and most conspicuous participant in art commerce, but was shut down in 2003 due to many unresolved issues relating to provenance, trust, transparency and complexity in transactions.

With the bubble burst in 2000, the Internet has become faster. This has provided Artists a platform for widespread online display of their art and as a result, thousands of new artists from across the globe have adopted the web. In addition, the emergence and popularity of social networking sites such as Facebook has accelerated and broadened the channels for art creators to publicize themselves.

The number of Artists and art inventory population growth, more Artists and Art Assets have surfaced than in the entire 700 years of known Art History. These emerging Artists are not from Europe and North America alone but include China, Russia, South America, Africa, Asia, and other global regions. There are still more than the thousands of talented artists from across the world whose work is remarkable but has yet to be profitable.

It would be fair to say that the promise of the Internet has yet to bring any meaningful and sustainable economic rewards for the estimated 90% of worldwide artists. Even though the Internet, they have no access to control and sell their work with ease and has propelled their virtual presence to a level beyond the initial purveyors anticipated.

There are several reasons for the bottleneck of traditional centralized trading center. First, buyers have a lack of trust in the authenticity and condition of art assets. Trust cannot be fully derived without provenance information – the trusted record of origin, ownership, authenticity and quality. Provenance is an integral part of the documentation supporting the authenticity of art objects and is vital for establishing and maintaining the investment value of art for buyers. So far, provenance and trust are in the hands of a few intermediaries who have extremely opaque business models and processes. They charge exorbitant fees for establishing provenance thereby restricting investment in art and obstructing the growth of an efficient and modern art market. Many countries and cities outside mainstream, European and US cities, are years behind in this cornerstone requirement for art commerce. Without trusted appraisal and trade systems, the true possibilities of global P2P exchange of Art and collectibles cannot be realized.

Second, the current art trade model has too many intermediaries that create a slow and highly friction-laden transaction process. As the Internet expands and reaches more territories of the world, more artists and their assets are visible online, however monetization of this art is saddled with transaction difficulties. Only a few Artists with connections with established intermediary galleries and auctions houses are able to realize monetary gains once hefty commissions and transaction charges are deducted.

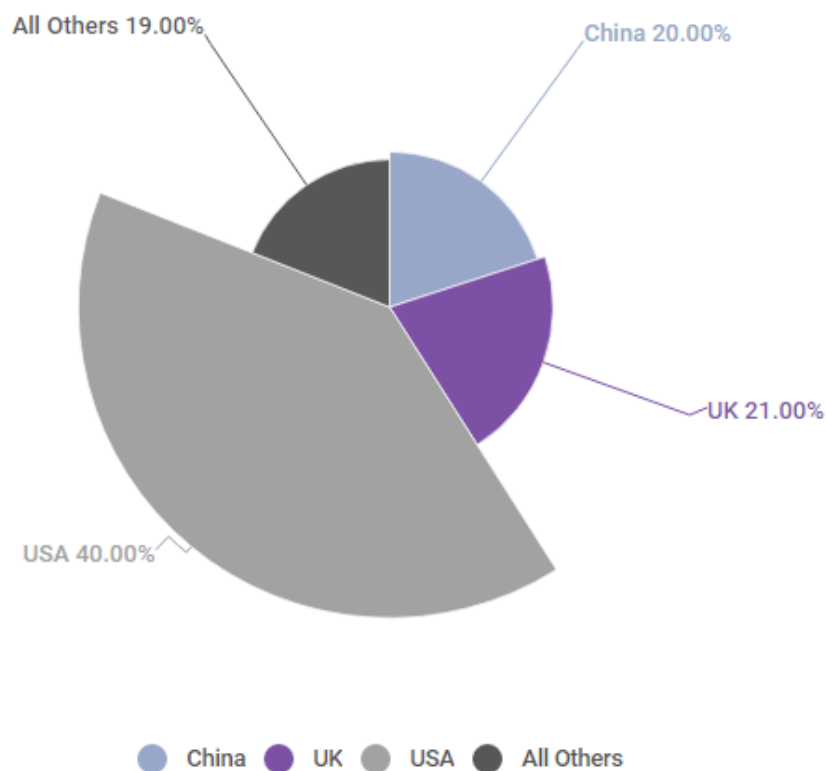
Third, the main reason of artist and artwork owners is to create an online presence is to reach a larger pool of potential consumers and create pre-sales awareness and interest. Increase in volume of uploaded art has brought an increase in problems such as forgery, imitation of artwork, theft of intellectual property and abuse of copyrights. It has become easier to commit fraud and other unlawful actions within the online ecosystem. There are certainly hundreds and thousands of forgers all over the world who are good at what they do and Art owners and artists is not be able to avoid it.

Finally, there are order fulfillment challenges. Payments, shipment, insurance, storage and delivery are additional obstacles in the growth of Art Commerce world. The fulfillment process is not yet reliable or standardized enough to be contractually enforced easily. In order to sustain the economic interests of artists globally, cross-border payments and delivery mechanisms have to be transparent and seamless.

Most of the above challenges can be addressed by the adoption of Blockchain technology that is suited to overcome precisely these types of issues. Blockchain has elements of trust, provenance, multiple party validations, immutability of historical transactions, and use of online cryptocurrency as a secure and transparent means for payment. With Blockchain and smart contracts that govern the business transaction rules, it will be more easier to buy and sell artworks. The blockchain provides additional traceability and authentication layers to support the sustainable development of online artwork ecosystems.

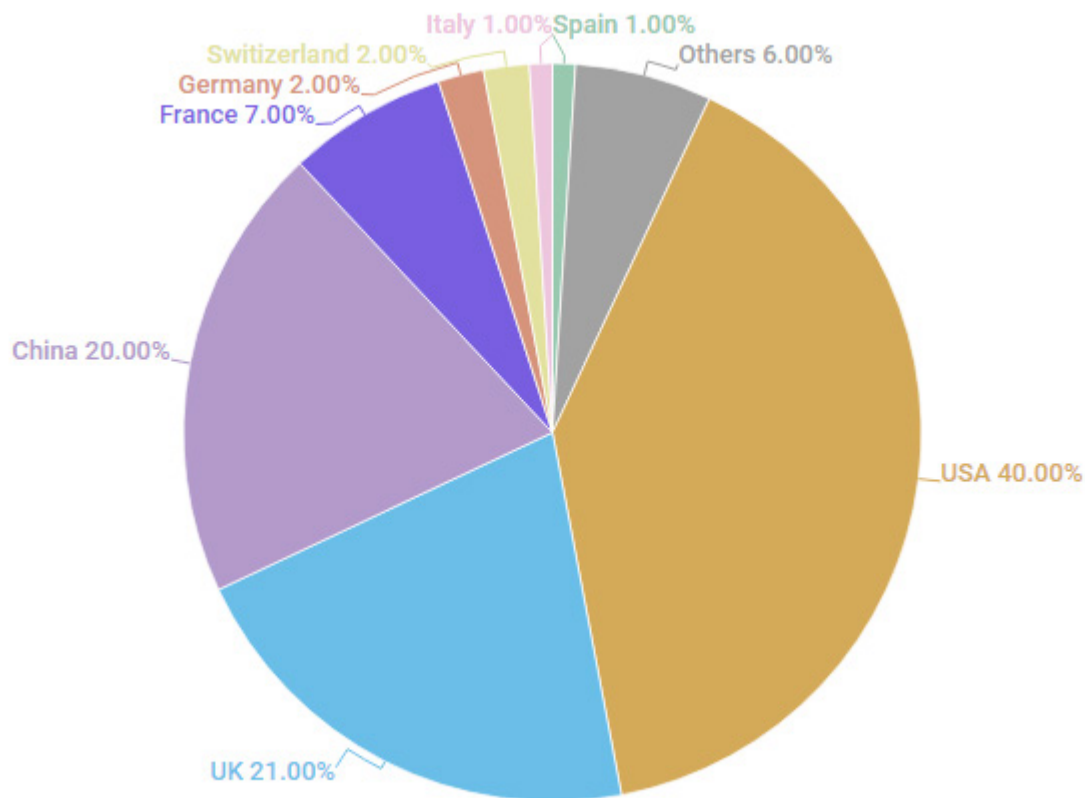
Market Analysis of Art Commerce

Art has always remained of great interest to humans since early ages. Interest in Art is not confined to a specific region or culture. People have pursued this profession equally in the times of war and peace for centuries. Art defines a civilization and culture, preserving art is an essential element of preserving a culture. Compared with other industries, the commerce aspects of the art market are famously difficult to quantify due to majority of art sales being conducted with discretion in private art galleries, exhibitions and auctions. Additionally, the existing online art Commerce branch of the market is highly fragmented with no visible leaders. The high-end of the art market is dominated by a few incumbent mainstream art dealers and auction houses, such as Sotheby's, Christie's, Bonham's, Phillips, and China Guardian.



The total sales of the global art market in 2017 reached 63.7 billion U.S. dollars, which is a 12% increase compared to last year. The second edition of Basel Art Exhibition and UBS Global Art Market Report, which has conducted a comprehensive and macro analysis of the global art market in 2017. The report pointed out that last year the global art market grew by 12%, with total sales reaching \$63.7 billion. art dealers sales increased by 4% in 2016 , which is up to approximately \$33.7 billion, accounting for 53% of the market. Open auction sales increased by 27%, which is up to \$28.5 billion, accounting for 47% of the market. The largest increases in open auctions and dealer sales occurred in the high-end market, while markets outside the high-priced products showed mixed performance.

European Art, Antiques and Exposition Art Market Report(TEFAF) Art Market Report 2017 shows that the trend of globalization is obvious. United States, Europe and China are the top three markets with a total sales of 26 billion US dollars. In 2017, US, UK and China are still the top three in terms of sales of artworks. These three regions accounted for 81% of the market. US with 40%, UK with 21% and China with 20%. The remaining countries accounted for 19%. including France with 7%, Germany with 2%, Switzerland with 2%, Italy with 1%, Spain with 1%, other countries with 6%. The report also shows that about 8% of the art public auctions are conducted online; for art dealers, online sales account for 4% of global sales. 64% of dealers already use e-commerce platforms, while 16% of dealers plan to online e-commerce platforms. The remaining 20% have no intention of turning to the online market due to lack of confidence. The growth momentum of e-commerce by art has nothing to do with it, but with the growth of the online art market, the duration of art forgery and fraud has also been on the rise, and there have been more fakes in paintings, sculptures and other artworks.



The world has experienced an enormous shift to online markets. Art e-commerce is emerging rapidly, this trend will likely continue and accelerate. Those who have successfully embraced the move to meet the demand from technological advances are thriving. Online presence is helping auction houses, dealers and artists expand beyond the traditional marketplace and reach new buyers and collectors. The ease and access of browsing the internet has shifted the local activity of buying art and antiques into a more global activity. Collectors are no longer bound by a limited selection of local galleries, dealers, and auction sales. As artists, dealers, galleries and auction houses promote their art online, the choice for collectors has broadened dramatically. With Blockchain, the hyperledger can confirm the authenticity of artworks. There is no doubt that the combination of the Internet and blockchain will have a revolutionary effect on the art market.

Traditionally, the source and identification of art has been in the hands of auction houses and dealers. They charge high fees to confirm the origin of the art, determine the transaction price and the transaction method. Most participants in this closed ecosystem cannot gain profit. Extremely opaque business models and processes make it difficult for ordinary buyers to participate. Art creators and collectors all over the world are just have no access to understand the story behind the identification and transaction of art. This opacity has hindered the overall growth of the artwork e-commerce industry.

As the world's top three, the Chinese art market is facing unprecedented opportunities. The Chinese art market will be thrived for 10 years after it has undergone adjustments deeply. We believe that there will be at least 10 giant companies with more than 10 billion RMB evaluation, and 100 art creators with 100 million RMB artworks in the next 10 years. The Chinese art market will be dominated by leading enterprises that regulate and standardize the management of Art. The IP, assets and securitization of artworks are playing a vital role in the art market. It allows more buyers and capital to participate in Art industries as an inevitable trend. In the investment portfolio of developed countries in Europe and US, Art investment account for 20% of the total. However, Residents of China's first-tier cities only invest 5% of their total asset in Art. In the international art market, artworks have long been the subject of investment. It is the "third wealth" after the world's top three investment projects relay stocks and real estate. It is a high value-added asset and its rate of return has far exceeded. The stock and real estate. The cultural industry will enter the trillion-dollar market from the scale of 100 billion. Artwork is rapidly being integrated into the homes of ordinary people. As mentioned above, with the internetization of life, the Chinese art market will gradually develop towards the Internet and the art finance Internet. The art financial Internet will gradually replace the auction house and become the main force of the art market.

In terms of policies, after the 2016 Chinese Ministry of Culture issued the "Measures for the Management of Art Operations", it officially released the "Notice on the Implementation of the Management of Art Operations", and plans to implement the Measures for the Management of Art Operations. It was emphasized that all localities must attach great importance to the management of the art market and conscientiously implement it. In 2017, the State Administration of Cultural Heritage of China officially issued the "13th Five-Year Plan" for the development of the national cultural relics undertaking, and proposed that the protection of cultural relics should be effectively strengthened and measures should be taken to make the cultural relics alive. Among them, "Encouraging the civil collection of legal relics and upgrading "The level of social cultural management services" is a matter of concern. After the clean-up and rectification of the exchange, it will truly assume the responsibility of returning to a fair, open and regulated art market. The discovery and promotion of the value of the collection of artworks will become the main direction.

Each piece of art is unique, and the treasures handed down are unprecedented. Since the art can meet the individual needs of some people, the new rich class in China hopes to demonstrate their own taste through the purchase of artworks. As a result, art has gradually become one of the symbols of high quality, wealth, and power. Art works as an asset allocation have the advantages of strong value preservation and high safety factor. Therefore, the Chinese art market will eventually experience rapid development as the luxury market, which is the inevitable trend of China's consumer strength and individual consumer demand. The high-net-worth crowds continue to be huge, more and more people have artistic tastes and aesthetic appeals, and the best-selling works of art are the future trends. Good prospects will accelerate the development of the art market.

The Problems of Traditional Art Data Platform

Difficulties to Distinguish Art's Authenticity

Art Market needs higher Professional accomplishment, in the art market, there is often a variety of counterfeits that cost investors heavily. Therefore, professional and authoritative appraisal is highly important. The forgery of artworks has been a major problem in the art market since ancient times. Works of art can be duplicated, and fakes can be sold as original products without identification. Without reliable means of traceability and identification, it is difficult for ordinary buyers to determine the authenticity of the bought artwork. It is common that a collector's artwork to be identified as a counterfeit.

Art Valuation System is Corrupt

Since artworks are non-renewable resource, its value system depends entirely on personal experience and expert evaluation. The art market is still very small, mainly because that the art market has a certain threshold for buyers. The ordinary buyers can't make a reasonable judgment regards the price of the artwork. Currently, art appraisal services based on experience and expertise are normally very expensive, and even so, only a small number of professional collectors can get relevant services. This makes the ordinary buyers to be deterred even if they are very interested in art investment.. If the artwork cannot be effectively identified or the process cannot be trusted, then it also cannot be valued, not to mention trading. Therefore, a artwork tracing/identification/collection data platform that can be trusted by the public is a prerequisite for the further development of the art investment market.

Lack of Regulation

Because the art market is an emerging market without effective regulation and industry standard, it's full of chaos on the transaction side and intellectual property side. On transaction side, each country legislates on the art market. The United States and the European Union have enacted relevant laws, and China has enacted the "auction regulation for cultural relics". Even so, currently the enforceability of the legislation is very poor, because a lot of trade in the centralized art market is difficult to trace, and data is tampered frequently which is difficult to ascertain the responsibility. Therefore, even with relevant legislation, there are many cases where there is no reliable evidence to enforce it. In terms of intellectual property, there are many prints and reproductions that are not authorized by art owners. Art creators and collectors have lost millions of dollars because their copyrighted works are illegally used. It is also difficult to trace these illegal activities in the traditional centralised art market.

The Transaction Problem of Centralized Platform

The development of the art market leads to the creation of art data centers, from national level to world level. However, whether the local or the global art data platform, there are many disadvantages. First, with traditional artwork trades, payment time

is unpredictable and delivery processes is cumbersome. It reduces buyers' willingness to trade. Art sales take time, and a valuable artwork may be sold by multiple dealers before it reaches the final buyer. The owner of a work of art that is displayed by one data center, and may not be updated timely in another data center. It may create confusion and cause potential buyers to cancel the deal. In addition, transactions also face great challenges about buyers' privacy protection. Buyers' privacy may be leaked at any time, and even illegal trading platform may embezzlement transaction funds..

The Revolutionary Innovation of Art Data Platform

In view of the problems faced by the art market, RCCC hopes to use the blockchain technology to decentralize the whole identification, trading and information storage system, and then promote the healthy development of the art market. At the same time, the new business model based on blockchain can also make RCCC a carrier for the global artwork trading. RCCC will provide services to art buyers and sellers around the world. RCCC uses the most secure and advanced technology to manage art data. RCCC will combine the distributed ledger and smart contract technology of the blockchain, so that the information of the artwork can be recorded in a distributed database, and it can avoid black box operation 100%. Not only does RCCC solution promote the development of the current art market, but also promote the creation of a new business model, which helps more art creators and collectors trade authentic artworks with safety. RCCC art traceability data platform base on blockchain, big data and Internet of things, and the RCCC is the medium of exchange. RCCC is addressing the core issues of the current global art trading system and gaining a monopoly in the field. RCCC will promote the establishment of a fully transparent commercial art market and attract more art investors to join in.

The goal of the RCCC art data platform includes following six aspects:

- Provides a means for collectors or artists to fundamentally protect their artworks.
- Eliminate the trade of fake art completely.
- Prevent all tampering actions with the information related to art assets.
- Provide a forever-online regulatory chain for art assets.
- Achieve fast, secure and confidential art transactions through smart contract.
- Minimize indirect costs such as identification, trading commissions and some unnecessary middlemen.

For traceability, RCCC's solution is a "artwork's owner centered solution." It aims to clearly articulate every aspect of the market chain's asset transfer, disposal, and trading for the art owner. Currently, we are using RCCC tokens to assist art collectors to store their artwork information on the blockchain and establish traceability, purchase, sales, insurance, and other related information.

For appraisal, we can evaluate art assets through a blockchain-based model. With the help of art appraisal experts and collectors from around the world, our solutions can provide the entire art market ecology with a blockchain mechanism. Excellent service, and allow more people to obtain

For trade, our platform can provide users with point-to-point artwork trading. Although our platform is a subversion of the existing art market, it may have a certain impact on the current industry giants. However, we believe that by adopting an open API approach, our platform can be implemented step by step. And help relevant personnel to reduce transaction costs and eliminate trade frictions. Our art data platform is not only an important supplement to the existing art market, but also can lead to new business models. Can easily adapt to the existing online art trading model.

For collection, it further provides an information exchange platform for art creators, auction houses, experts and collectors. We can provide price data, news, artwork reviews and other services for galleries, museums and auction houses. We will provide important support for the flourishing development of the art market and establish cooperative relationships with art creators, distributors and auction houses.

In the initial stage of platform build up, since the current user community of cryptocurrency is still limited to the market for art exchanges, the platform will accept renminbi currency payment in addition to cryptocurrencies. In order to fully exploit the characteristics of the blockchain and gain more market share, our platform needs to attract a large number of users through the network effect. In the middle of the platform construction, our main goal is to encourage all users to use blockchains and cryptocurrencies. We will provide cryptocurrency users with discounts and rewards. The blockchain function used by our platform includes a decentralized art asset data platform and chain of custody. Each artwork's source and data storage RCCC will collect a fee, and the remaining amount will be distributed to the art group. Experts, collectors and contributors. All token-related transactions will be managed by smart contracts in the EOS blockchain.

The background is a traditional Chinese ink wash painting. It depicts a wide river or valley winding through a landscape. On the left, there are steep, rocky cliffs with some sparse trees. In the center, a river flows towards the background. On the right, a small village with traditional Chinese architecture is nestled on a hillside. The sky is filled with soft, misty clouds, and several birds are scattered across it. The overall style is expressive and atmospheric, using varying shades of ink and wash to create depth and texture.

RCCC Platform

Blockchain + Big Data + AI + IoT

RCCC Data Platform Main Components

The RCCC platform consists of six major components:

RCCC blockchain database and user interface

RCCC uses a cloud-based database with comprehensive e-commerce capabilities, tools and utilities to help independent artists of all types maintain their art works. Artists can use the platform to “mark” the selected artwork they wish to sell and conduct commercial transactions. This database is designed for structured and unstructured data. The art creator/owner does not have to “mark” all the artwork and display it on the blockchain. They can simply use the platform to retain digital versions of their assets in the form of directories and “virtual galleries” and use the platform for promotional purposes. Collectors, art creators, and art auction companies can access detailed records about the art works and collect metadata of art works from the blockchain to facilitate transactions.

Smart contracts

The RCCC uses smart contracts to record the provenance of the asset, the preservation of the artwork, and ownership for the transaction. This component provides a user interface to enable access to the EOS blockchain registry, where the assets are stored. The EOS blockchain is a key part of the RCCC platform. The RCCC uses the blockchain distributed ledger as the “asset ownership registry”. It is a secure and publicly accessible registry that uses advanced encryption technology. The EOS blockchain registry is powerful and permanently tamper-proof. So any art asset can be traced back to its origin.

Middleware and application programming interface (API)

The RCCC platform provides rich external APIs. Its function is to help all users using the RCCC platform to interact with the platform in a specific way. For example, RCCC has a specially designed API interface for auction houses, dealers, art galleries and art creators. They can connect to RCCC platform through an external platform interface. For example, service providers such as insurance companies, transportation companies, printing services, and storage services can also use the specified API to interact with the RCCC platform.

It is worth mentioning that RCCC also provides art creators and appraiser with proprietary APIs. Through the APIs provided by RCCC, it is possible to identify the authenticity of each piece of art. Appraisers are rewarded in the case of correct appraisal. At the same time, RCCC provides the final appraisal result by integrating the appraisal opinions of a group of appraisal experts in the system, and gives corresponding rewards to appraisers who make the correct appraisal.

Search engine using artificial intelligence

This component is a search engine for database that uses AI to enable image based search and recommendations. The image and object recognition component uses powerful artificial intelligence engines and algorithms to understand user preferences from their browsing history and can better recommend to users the artwork they may like. The engine uses state-of-the-art image recognition and matching technology, which is designed to automate the marketing and promotion of artwork. It is convenient for art lovers to find their favorite artworks, and it is also convenient for art creators to better promote their own works.

Mobile device interface

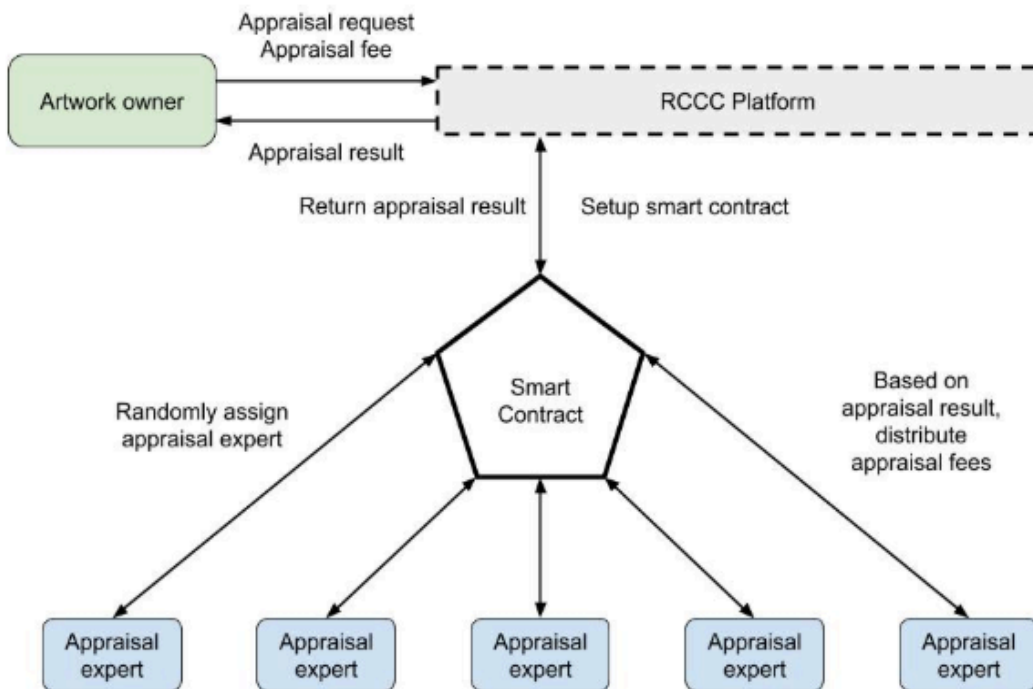
The RCCC platform will also develop a mobile user interface. All information about the provenance and details of the art assets will be available from the mobile application. At the same time, the art assets can be traded and authenticated on the mobile platform, and these data will also be recorded on the blockchain. The RCCC platform plans to support Apple iOS, Google Android and Microsoft Windows

Complaint handling system

Complaints, frauds, disputes and arbitration will all be managed by this module. RCCC platform will randomly select pre-approved arbitrators. A smart contract will run through the entire conflict resolution process.

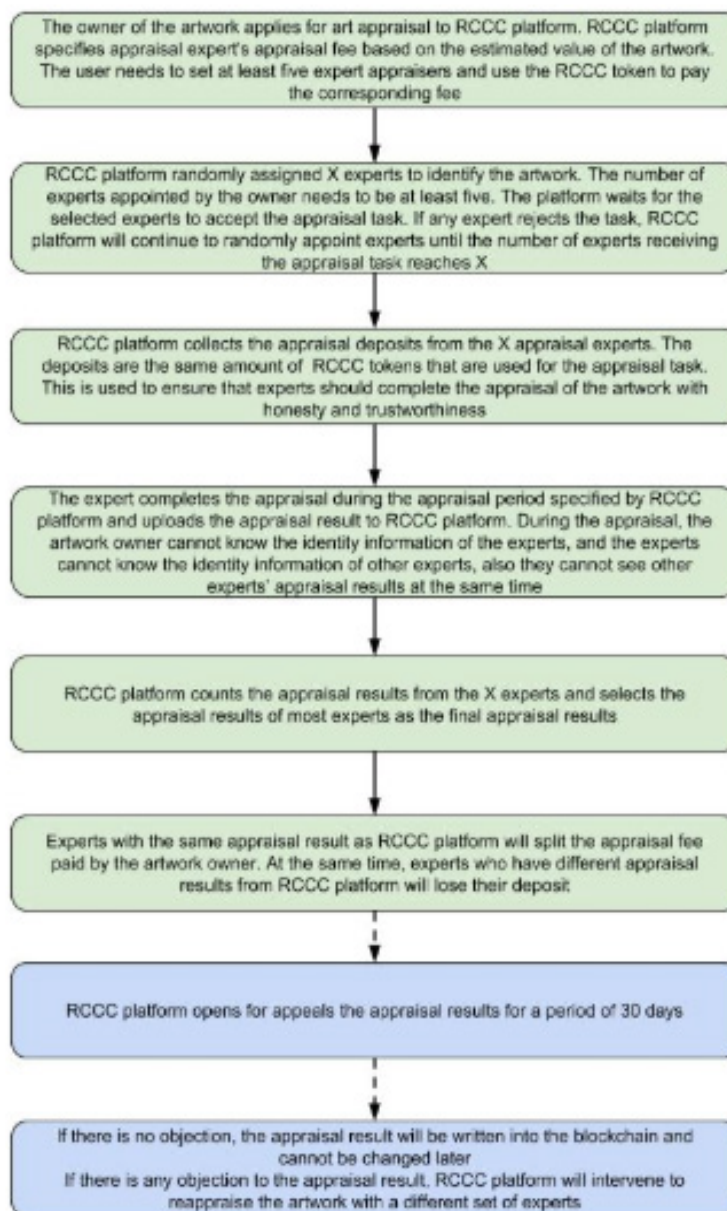
RCCC ART Appraisal System

The RCCC Appraisal Mark is a symbol of artwork that has been certified by the RCCC platform. The RCCC Appraisal Mark will record all the information of the identified artwork and provide certain assurance of the authenticity of the recorded information. The contents appraised by the RCCC Appraisal Mark include the creator of the artwork, the time of creation, the place of creation, the owner of all histories, the purchaser of all histories, the time and place of purchase of all histories, the bid at the time of the last purchase, and all the historical appraisals. Also, RCCC Appraisal Mark records the defects of the artwork, and where applicable, the number of the same artworks that are circulating in the market.



The goal of RCCC is to develop a global network of experts that can be relied on. The reliance on a global network of experts to maintain and develop personal relationships with local art creators is an important part of the RCCC business model. These experts will be able to review through visual inspections when necessary and ensure the quality of artworks. If necessary, trading rules for certain artworks will require the publication of product identification videos and interviews with art creators. In addition, RCCC will also record the reputation of experts in the blockchain, prompting experts in the rating system to remain honest and fair.

RCCC guarantees that each platform's appraisal expert can evaluate each artwork fairly and honestly. The figure above shows the identification process of an artwork on the RCCC platform. The specific rules of appraisals are as follows:



The expert appraisal mechanism provided by RCCC platform ensures the high credibility of the appraisal with the following essential points:

- Randomly selected experts on RCCC platform prevent unfair identification from biased review because that the owner and the expert know each other beforehand.
- During the appraisal, the owner of the artwork did not know the appraisal experts. The experts did not know the identity information of the owner, which will prevent offline communication and transactions between them, which may affect the appraisal result.
- RCCC platform also anonymizes experts among each other, in order to prevent communication among experts, and avoids bias on the appraisal result.
- RCCC platform keeps the appraisal results from each expert confidential, avoiding expert's judgments are influenced by the appraisal results from the other experts.
- RCCC platform agrees with the appraisal results from the majority of experts. The majority experts share the appraisal fees evenly. The minority experts lose their appraisal deposit. This strategy encourages experts to appraise each artwork honestly.
- RCCC platform records the success rate of each expert, and high success rate experts will be assigned with more appraisal tasks and in return, earning more appraisal fees.

All of the appraisal experts in RCCC platform are rigorously examined offline. RCCC platform in return provides them with a platform to earn appraisal fees. The rigorous appraisal process ensures the fairness of the art appraisal and confidence of the result. If an RCCC user wants to become an expert in art appraisal, if there is enough RCCC users to vote for a user and think that the user's knowledge and interest in the artwork have reached a certain level, then the user can apply to become an expert in appraisal.

RCCC Data Storage

RCCC uses blockchain storage and cloud storage to store data. In the following sections, we will introduce the application of these two storage technologies in details.

RCCC Blockchain Smart Contract

Although the detailed attributes of assets are stored off-chain (stored in HDFS in the RCCC cloud), the relevant records confirming their provenance and ownership are stored on the blockchain registry in the form of smart contracts. RCCC uses EOS as its underlying blockchain infrastructure. EOS is like a distributed operating system, where developers can build their own distributed cryptocurrency applications for their business needs on the EOS platform. Who owns the EOS token has the requirement for server resources because the developer needs to have EOS currency to use the platform. However, this does not mean that developers must consume EOS to use server resources. EOS tokens can be used to support blockchain bandwidth, computing power, and storage capabilities. EOS uses the equity-protocol formula algorithm, so there will be no energy-intensive power mining processes like Bitcoin and Ethereum. EOS allows developers

to make applications for end users. Applications on EOS will be able to communicate with each other, sharing frameworks and libraries. This feature will make applications on EOS run faster and with greater security. At the same time, EOS will make the interaction completely transparent to the user, making its user experience better than other blockchain platforms because most end users may not know that they are interacting with such applications when using EOS.

The smart contract in RCCC contains the definition of data types and instructions for data manipulation, ie the collection of data structures and related algorithms. The definition of data manipulation is the core of a smart contract because it implements the actual logic flow of the contract, and the definition of the data type is an aid to this implementation. The operation of the RCCC smart contract runs in a message-based communication architecture, and the client invokes related operations by sending or pushing messages to the nodes of the EOS. After the EOS node receives the message, it requests the relevant resource and executes the smart contract WebAssembly (WASM) code. If the code runs smoothly, the EOS node will continue processing the next operation. Multiple operations in a smart contract can be combined to form a transaction that is executed by a combination of EOS nodes. Of course, the operations can be sent individually, or they can be sent and executed in combination as a whole.

From the macro level of the blockchain, each node in the blockchain network gets a copy of the smart contract and runs each operation in each contract. After the contract is sent to the blockchain, the smart contract owner receives the transaction receipt generated by the corresponding node. However, this receipt does not mean that the transaction has been confirmed, it only means that the node accepted it without mistakes. In the actual processing, not all nodes will actually execute each smart contract. On the contrary, some nodes in the blockchain will perform the actual work of the smart contract, while other nodes need to handle the task of proving the validity of the transaction block.

If a transaction in the contract fails to execute, the blockchain node must roll back the results of all operations in the transaction. Before processing an operation, the node executing the smart contract establishes a clean working storage area for the operation to save the working variables. These memories are only suitable for this specific operation, even if different operations in the same transaction can not share memory to ensure the security of smart contracts.

Smart contracts and smart contracts are also interactive. However, the communication modes between contracts are asynchronous because different contracts may run on different nodes in the blockchain, which is a large distributed computer. Therefore, the output of the running results cannot be Guarantee effectiveness and consistency. The smart contracts on EOS mostly use online communication and delayed communication. The online communication is in the form of an operation request as another operation that needs to be performed as part of the calling operation. The online operation uses the same scope and permission of the original transaction to operate. And it is guaranteed to execute with the current transaction, that is, to call the nested transaction in the transaction. If any part of the transaction fails, the online operation will roll back with the rest of the operation. In the delayed communication model, the communication party needs to estimate the waiting time based on its own judgment, so the result of the contract execution cannot be guaranteed. Because of this, the initiator of the communication can cancel the delay operation without necessarily waiting for the other party to return the result forever.

RCCC Blockchain Smart Contract

In order to support higher frequency transactions and queries for users on RCCC platform, the use of proof of work (PoW) consensus algorithm is unrealistic because the proof-of-work algorithms often rely on a large amount of computational effort and result in lower transaction throughput. Therefore, we must adopt an equity-consensus consensus algorithm to support efficient and rapid transaction processes. RCCC uses a consensus algorithm similar to EOS, that is, DPoS, which is an authorization and equity consensus algorithm. The DPOS algorithm is divided into two parts: the election of blockchain packers and the packaging of blockchain transactions. The block packers' election algorithm is an important prerequisite for ensuring the orderly operation of the blockchain. After the packers are elected, the specific transaction packaging process is relatively easy to solve.

Blockchains using the PoW consensus algorithm have obvious drawbacks, including a large amount of computational resources and computational effort, as well as lower transaction throughput. One of the most obvious examples is Bitcoin. Since the Bitcoin blockchain was launched in 2009, more and more users are engaged in mining, and the mining equipment has evolved from the original CPU machine to a GPU and a dedicated ASIC mining machine. According to digoeconomist calculations, bitcoin costs about 900 kWh for each transaction, while bitcoin mining machines consume more than \$3 billion a year in total electricity consumption, which is similar to a year's total electricity consumption in a medium-sized country. However, even if more and more users are involved in bitcoin mining, the computing power and energy consumption are getting higher and higher, and the transaction speed of the Bitcoin blockchain has not improved. From the date of getting online, the transaction throughput that the bitcoin network can support is limited by its block size and block time. The original design of the Bitcoin blockchain limited the network to generate a new block approximately every ten minutes, and the size of each block is limited to a maximum of 1MB, resulting in an actual transaction throughput of the blockchain network of approximately 3.6 to 7 transactions per second. In order to increase the transaction throughput of the blockchain, the blockchain technology represented by Ethereum generally reduces the block generation time. Ethereum's block time is about 15 seconds at this stage, so its transaction throughput has been greatly improved compared to the Bitcoin blockchain. However, because Ethereum continues the work proof mechanism of the first-generation blockchain technology, the Ethereum blockchain also often suffers from situations where large amounts of transactions cannot be processed in time.

In order to support users of higher frequency transactions and queries on the RCCC platform, it is unrealistic to use working proof PoW consensus algorithms because the proof-of-work algorithms usually rely on a large amount of computational effort and lower transaction throughput. Therefore, we must adopt an equity-consensus consensus algorithm to support efficient and rapid transaction processes. The RCCC uses a consensus algorithm similar to EOS, that is, DPoS, which is an authorization and equity consensus algorithm. The DPOS algorithm is divided into two parts: the election of blockchain block packers and the packaging of blockchain transactions. The block miner's election algorithm is an important prerequisite for ensuring the orderly operation of the blockchain. After the miner is elected, the specific transaction packaging process is relatively easy to solve.

The DPoS mechanism guarantees the security of voting while providing a higher transaction throughput per blockchain. DPoS uses strict proofs to safeguard the fairness and safety of the notarization of the vote. Among them, DPoS can effectively avoid a variety of existing blockchain attacks, including:

Multiple-consumption attacks Attackers exploit the weaknesses of blockchain transaction data in distributed systems that cannot be synchronized in real-time to attempt to

transfer assets they own multiple times. This type of attack in DPoS cannot be successful, because as long as transaction data in the system is confirmed by honest participants, it can no longer be modified, and these data will be synchronized to other participant nodes in time. This makes it impossible for an attacker to invalidate information that has already been confirmed by the entire system.

Deal Denial of Attack In this type of attack, the attacker tries to reject a transaction that is being verified in order to break the transaction of others. Such attacks are also unlikely to be successful in DPoS because the online nature of DPoS guarantees that as long as there are enough nodes to confirm a certain transaction, the transaction will be confirmed.

Anti-synchronous transactional informational attacks In this type of attack, the attacker intentionally or unintentionally synchronizes the blockchain information with other nodes in the network and attempts to perform offline transaction tampering. DPoS will not allow such attacks because all transaction information is time stamped. The attacker's failure to synchronize the latest blockchain information means that his block information contains an incorrect timestamp. Other network participants rejected it. As long as less than 50% of the network nodes are correctly synchronized, such attacks are unachievable.

51% attack When an attacker owns 51% or more of the blockchain, he can tamper with the data. First of all, the distribution of shares in DPoS is a strictly controlled process. Usually, the distribution of shares of all participants will be very even, so that this problem can be eliminated from the source. In addition, even if some attackers succeed in acquiring more than half of the shares, other participants can quickly transfer to another fork, thus making the shares obtained by attackers lose any meaning.

Selfish Mining Attacks In this type of attack, the attacker retains certain blocks of the package for a period of time and waits until it is released to try to eliminate the blocks that are packaged by the honest nodes from the main chain. In traditional bitcoin rewards, this behavior can allow attackers to have higher rewards. However, these behaviors are neutralized in DPoS. This means that the attacker cannot obtain any additional rewards from this type of behavior, thereby encouraging the participating nodes to promptly publish correctly packaged blocks to the main chain.

Obviously, the security of the DPoS algorithm is not limited to the above points, because its security performance and low-cost features allow us to minimize the operating costs of the system, while supporting secure blockchain operations, DPoS is the best consensus algorithm for RCCC platform.

Smart Contracts and Traceability of Artwork

The key attributes of RCCC blockchain platform are its comprehensive support for IoT hardware and sensors, as well as advanced machine learning and big data mining algorithms. Comprehensive IoT sensors provide the ability to tag and monitor art objects and transmit relevant data to smart contracts. This compatibility allows us to keep track of the artwork's flow trajectory and status information for a long time and ensure the integrity of the data.

RCCC collects data mainly from tags, trackers, and sensors. The label is usually located on the invisible part of the artwork (such as the back of the picture frame) to provide information about the product and its identity. Common labels include barcodes and passive electronic RFID stickers. The tracker is a natural component of an artwork or an additive. The component

is inserted into the product (including the addition of specific additives in modern inks), while the sensor is detectable and responds to certain types of input. The physical environment sensor characterizes the product and its environmental properties. By collecting and tracking such data, we can easily detect data anomalies and perform specific automated or manual inspections.

The physicochemical structure, composition, properties, and quality attributes of an artwork may change slightly throughout the life cycle. Therefore, the analysis system of RCCC is mainly based on physical analysis methods, including optical, electrical, and acoustic technologies. At the same time, the environment of the works of art will greatly affect its preservation and value. Therefore, we also need to record the surrounding environmental information of the artworks, such as temperature, exposure, humidity, movement, and oxygen content. The hardware device will automatically record this information with the smart contract on the blockchain, and the smart contract will allocate this information to the corresponding data storage, and perform preliminary data analysis and subsequent processing.

When information is transmitted from the device to the RCCC network, the data is bounded to a specific smart contract and broadcasted to the entire network. The public information sent by smart contracts includes:

- 1.Tag ID or sensor ID, location and time
- 2.Digital certificate and transaction ID
- 3.Art Condition and Safety Attributes
- 4.Ambient environmental data (such as transportation, handling, storage conditions, etc.) measured by sensors
- 5.Testing system integrity



Public information sent by smart contracts

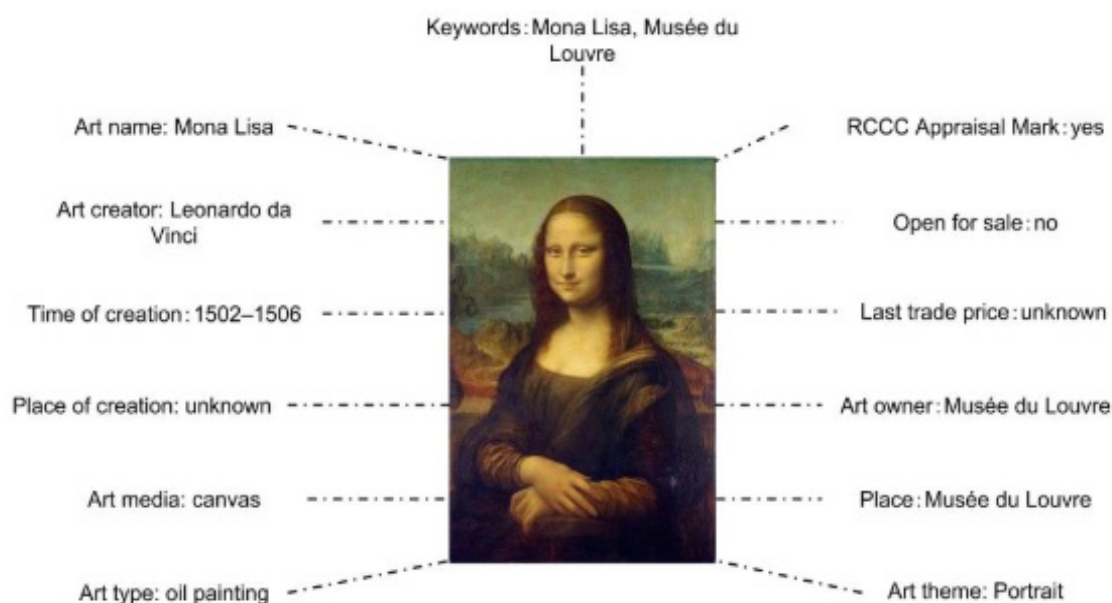
It is worth noting that all data transmission processes are strictly encrypted to ensure the security of data transmission. At the same time, the smart contract will also delegate abnormal data to the artificial appraisal expert for professional identification after the preprocessing of the artificial intelligence detection algorithm. Expert appraisal results will also be stored in blockchain data to ensure data consistency and integrity.

Due to the open and transparent nature of blockchain technology and the immutability of data, the historical information of an artwork can be retrieved at any stage. At the same time, these historical data can accurately describe the entire process of creation, display, and transaction of the artwork due to its authenticity characteristics, which runs through the entire life cycle of a work and is therefore extremely valuable. The search for historical information on artworks can promote the mobility of the token economy and attract more users to join RCCC platform to promote the development of the art ecology.

Cloud Storage Technology: HDFS

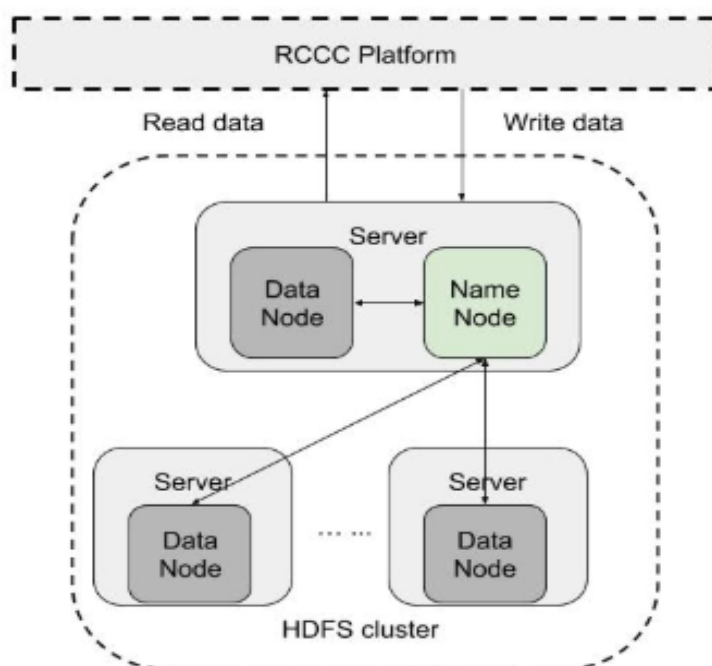
HDFS is an abbreviation of Hadoop Distributed File System. It is the mainstream platform for big data cloud storage. Data stored using HDFS can be efficiently read by the upper application to do big data processing such as machine learning and data mining. Specifically, RCCC uses HDFS to store information describing a piece of art in the cloud. RCCC's cloud HDFS can hold detailed information on almost all known art (past and present). These works of art include paintings, illustrations, photographs, antique furniture, jewelry and sculptures with complete attributes. Different art types will contain different attributes. For example, paintings, photographs and antique furniture will require different attributes to depict.

Here is a list of attributes stored in the HDFS for a painting:



RCCC data storage platform is powerful and provides a variety of query tools, allowing users to search the database and find information on the artworks they want. Users can use art creators' names, art times, art names, cities or countries where artists were born, exhibition art galleries, main colors, and objects in paintings/photographs to search through a large number of art databases. Optionally, to help locate and identify the artwork, the user can enter a color or the shape of the object in various parts of the image, and the object (ship, man, woman, child, animal, tree, snow, rock, etc.) to search. This search experience is provided by an artificial intelligence search engine on the RCCC data platform. We also use artificial intelligence algorithms to compare works of multiple art creators and recommend similar works to users. We will introduce in details the technical implementation of RCCC's big data platform in the following sections.

HDFS is currently the most advanced storage solution for deep mining and big data processing. Specifically, HDFS is the Apache Software Foundation project, which is the parent project of the Apache Hadoop project. Hadoop is ideal for storing large amounts of data (such as TB and PB). HDFS allows us to connect nodes (usually virtual machines) contained in multiple computers or clusters, and distribute data files on these computers. Then, we can access and store the data file as a seamless file system. Access to data files is streamed, which means that applications or commands can be executed directly through the MapReduce processing model. In addition, HDFS is fault-tolerant and provides high-throughput to large data sets. Therefore, HDFS is an ideal distributed storage system for RCCC large-scale data sets, that is, artwork-related pictures and text data.



In HDFS, the NameNode manages file system namespace operations such as opening, closing, and renaming file and directory operations. The NameNode also maps data to DataNodes to handle read and write requests from HDFS clients. The DataNode also creates, deletes, and copies data based on the NameNode's instructions. NameNode and DataNode are software systems implemented in JAVA. The design realizes that the system can run on commodity hardware across multiple heterogeneous operating systems in a

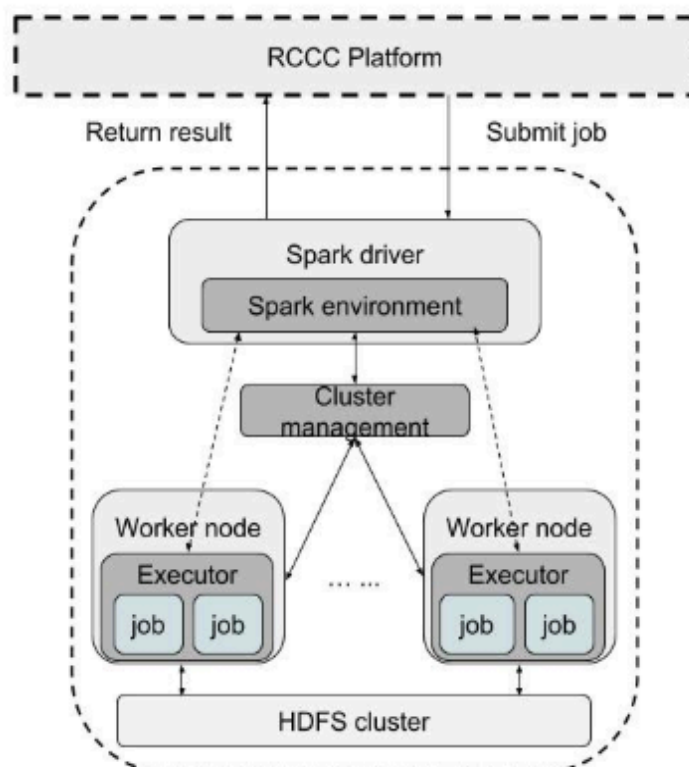
distributed manner. A typical HDFS cluster has a dedicated server running a NameNode, and the other servers in the cluster run as DataNodes. The DataNode keeps waiting for the NameNode command. Each DataNode maintains an open server socket so that clients and other DataNodes can read and write data. The NameNode knows the server socket number of all DataNodes and provides this information to clients and other DataNodes in the cluster. Specifically, all HDFS internal communications are based on the TCP/IP protocol. The HDFS client connects to the NameNode, opens the Transmission Control Protocol (TCP) port, and then communicates with the NameNode using a proprietary protocol based on Remote Procedure Call (RPC). The DataNode communicates with the NameNode using a block-based proprietary protocol.

RCCC Big Data Platform

Big Data Processing Engine-Spark

Spark is an open-source cluster computing environment similar to Hadoop, but there are some differences between the two. These differences make Spark perform better in certain workloads. In particular, Spark enables distributed data sets in memory to optimize iterative workloads and providing interactive queries.

Although Spark was created to support iterative jobs on distributed data sets, it is actually a supplement to Hadoop running in parallel on Hadoop file systems. This is supported through a third-party clustering framework called Mesos. Spark is ideal for building large-scale, low-latency big data analytics and learning applications. This is why RCCC platform supports Spark processing engine.



The advantages of Spark:

Fast Spark has an advanced DAG execution engine that supports looping data flow and memory calculations. Spark program runs in memory at a speed 100 times faster than Hadoop MapReduce, and Spark runs 10 times faster on disk than Hadoop MapReduce.

Easy to use Spark supports rapid application writing using the Java, Scala and Python languages, providing over 80 advanced operators, making it easy to write parallel applications.

General Spark can combine SQL, Streaming, and machine learning. Based on Spark, there are a series of advanced tools including Spark SQL, MLlib (machine learning library), GraphX, and Storm that support the use of these architectures in an application.

Integrate Hadoop effectively Spark can specify Hadoop, YARN version to compile the appropriate version, Spark can easily run on EC2, Mesos, can also be run in stand-alone mode, and read from HDFS, HBase, Cassandra, and other Hadoop data sources data.

High resource utilization The multi-frame shared resource model effectively solves the problem of task congestion during peak hours due to application imbalance or idle tasks during idle periods. At the same time, it balances the utilization of resources such as memory and CPU.

Data sharing With the increase of data volume, the cost of data migration will increase, and network bandwidth, disk space, and disk IO will become bottlenecks. In the case of distributed data, the cost of task execution will increase, and the cycle of obtaining results will become longer. The data sharing model in Spark allows multiple frameworks to share data, significantly reducing data transfer costs.

Effectively reduce maintenance and management costs: With the shared mode of Spark, only a small number of operation and maintenance personnel and managers is needed to complete the unified operation and maintenance of multiple frameworks.

Cluster Resource Manager: YARN

RCCC uses YARN to manage and arbitrate RCCC platform resources. It tries to maximize the use of platform resources while satisfying the data user's computing quota. In other words, it will automatically assign the user's computing task to the server that is best suited for execution. Specifically, in the YARN architecture, the global ResourceManager runs as the main background process, which usually runs on a separate computer and arbitrates the available cluster resources of competing applications. The ResourceManager keeps track of how many available nodes and available resources are in the cluster, and coordinates user-submitted applications and helps them acquire these resources. The ResourceManager is the only process that owns this information, so it can allocate (or schedule) decisions in a shared, secure, multi-tenant manner (eg, based on application priority, queue capacity, ACL, data location, etc.). In addition, ResourceManagers do not care about the type of application or task. All application framework-specific code is transmitted to its ApplicationMaster so that any distributed framework can be supported by YARN—as long as someone implements the corresponding ApplicationMaster for it. Therefore, thanks to this common approach, YARN can manage the cluster resources of many different workloads. In the RCCC platform, YARN supervises the operations of MapReduce, Storm, Spark, SparkML, and Mahout. This method obviously offers many advantages, including:

- Higher cluster utilization, unused resources in one frame can be used by another framework
- Reduce operating costs because only one "all-in-one" cluster needs to be managed and run
- Reduce data movement because there is no need to move data between Hadoop YARN and systems running on different machine clusters
- Managing a single cluster will also lead to greener data processing solutions. It uses less data platform space, uses less silicon, consumes less power, and has less carbon emissions simply because we performed the same amount of computation on a smaller but more efficient RCCC cluster.

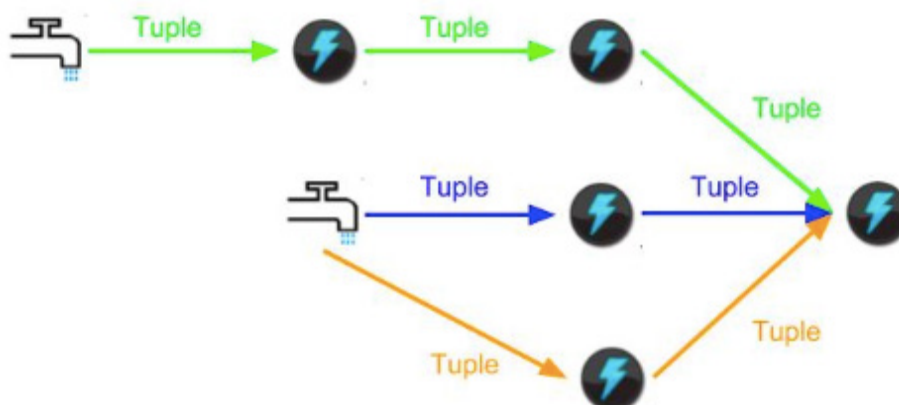
Stream Processing Engine: Storm

RCCC uses Storm for stream processing on its big data platform. Storm can handle continuous data streams from any data source. The RCCC uses Storm in many scenarios, including updating artwork bids and tracking the sale of all artwork on the platform.

Storm is a free open source distributed real-time computing system. With Storm, it is very easy to handle unlimited data flow. Like Hadoop batching big data, Storm can process data in real time. Storm is simple and can use any programming language. Before Storm, doing real-time processing was a painful thing: there was a need to maintain a bunch of message queues and consumers, and they formed a very complex graphics structure. A large amount of time is paid to sending messages, receiving messages and how to serialize messages. The real business logic only accounts for a small part of the source code.

Storm completely solved these problems. It applies to distributed scenarios, abstract messaging, and automatically handles flow calculations on cluster computers, enabling users to focus on real-time business processing logic. Storm implements a data flow model in which data flows through a network of many transformed entities. A Tuple is like a data structure that can represent standard data types such as int, float, and byte arrays or user-defined types. Each Tuple is identified by a unique ID that can be used to build data sources for various components in the flow topology.

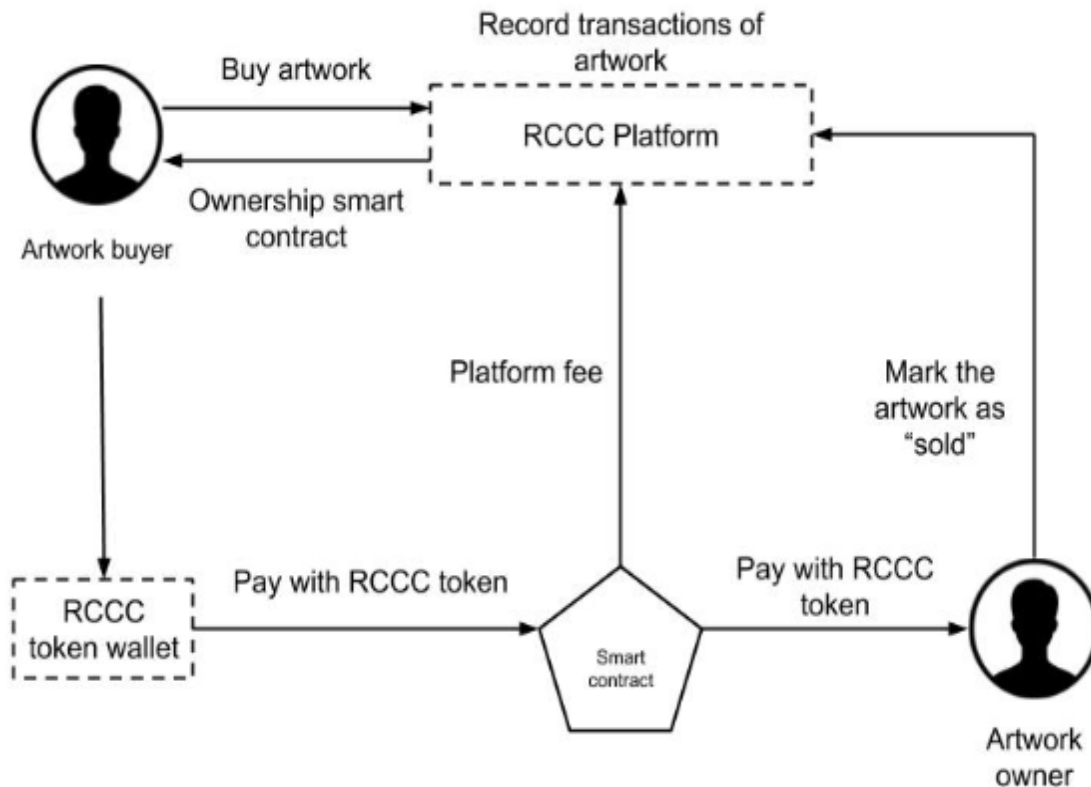
As shown in the figure below, the tap represents the source of the data stream. Once the tap is turned on, the data will be processed continuously through bolt. There are three streams in the graph, represented by different colors. Each data stream contains continuous data Tuples that carry specific data. Tuples process through the different transformation entities in the bolt.



Storm does not impose any restrictions on the destination of data input and output data. Like Hadoop, it is necessary to put data into its own file system, HDFS. In Storm, any data input source and any data output can be used as long as the user implements the corresponding code to read/write (deserialize/serialize) the data. In typical scenarios, input/output data is based on message queues (such as Kafka or ActiveMQ), but databases, file systems, or Web services are also possible data sources.

RCCC Platform User Cases

Art creators, art collectors, and art dealers are users of the RCCC Art Platform, and RCCC platform provides them with appropriate services. RCCC platform services are completed using RCCC tokens.



Artwork Trade based on Blockchain

Artists will benefit most from using RCCC tokens. First, they will be able to protect their artistic assets. They will have full flexibility to generate unique asset tags linked to individual art assets, and we record this ownership in a unique smart contract. This unique smart contract will identify that the art creator owns the specific artwork, and that only the art creator can decide the ownership transfer. As a result, this unique smart contract can have an additional price (eg, 100

RCCC tokens), which is determined by the art creator/art owner with the assistance of an appraisal expert. Art creators can sell this smart contracts for the ownership of artworks on the platform and receive payment guarantees when all terms related to the "sales of smart contracts" are met. These terms can range from full sales and on-site delivery to packaging, transportation, insurance and delivery to buyers. As long as the terms of the "sale smart contract" are met, payment can be guaranteed to the art creator regardless of where the buyer comes from. The use of RCCC tokens to trade artwork will ensure that the works of art creators worldwide will be guaranteed. Specifically, when they use RCCC tokens, the ownership of their artwork will be written forever in a one-time record in the immutable blockchain smart contract. Artists can register as RCCC platform users through the user-friendly RCCC user interface. Once the art creator/owner registers on the platform and creates a personal profile, they can start uploading pictures of their work and store detailed tag data in the work to create their own art catalog. Artists can upload snapshots of his/her work in multiple resolutions for a better user experience. RCCC supports rich artwork labels, such as the size, orientation of the artwork, the

Each art asset can only be represented by a single proprietary smart contract. If an art creator wants to sell four original works of art he owns, he needs to create four separate proprietary smart contracts, one for each asset. To obtain this special proprietary smart contract, the art creator/work owner must upload a photograph of the artwork to the smart contract registry. After complying with the terms of the smart contract and completing expert appraisal, the ownership of the work will be linked to this proprietary smart contract, and the artistic creator who owns this proprietary smart contract will be the owner of the artwork. Once the work enters the blockchain, permanent connections will be established between the artists and their artistic/creative works. This link - ownership records, can be permanently verified and tracked. Because artworks are represented by proprietary smart contracts, art creators/owners can use RCCC tokens to price, sell, commission, rent, mortgage, give away, or donate artwork. Every transaction of the artwork will generate a new proprietary smart contract. The person who owns this proprietary smart contract will be the new owner of the artwork, and all transaction records for a piece of artwork will be available through blockchain. And it is fully traceable.

Art Market without Barriers

Art buyers and collectors can search for their favorite art creators and artwork through RCCC platform, including art museums, galleries, and individual works in any city or country. As long as the searched artwork is labeled as "for sale," they can purchase the work through RCCC platform. RCCC platform provides a very comprehensive user search interface for art buyers and collectors. The basic search provided by RCCC uses keyword matching, such as: the name of the art creator, the city where the art creator was born, the name of the artwork, the age of the artwork, the type of artwork (landscape, portrait), the main colors of the artwork, the theme of the artwork or other related keywords. RCCC also provides a more powerful search function. By uploading images by the user, the RCCC searches for exact matches or similar works by using the platform's image recognition function so that the buyers and collectors of the artworks can find their favorite artworks through images. At the same time, this artificial intelligence (AI) system can also recommend artwork based on the user's browsing history and set art preferences. When art buyers and collectors find their favorite work and the work is available for sale, they can query all the transaction records of the work and all the historical expert appraisals through the blockchain interface provided by RCCC platform before deciding to purchase.

The Value of Art Trade Record

RCCC platform allows anyone to track the transaction history of an artwork so that buyers can better understand the origin of an artwork. On the other hand, through RCCC platform traceability, galleries and art collectors can better track their promising artists, understand the direction of their works, and predict the market value of these artists' future works based on historical transaction records, or arrange targeted marketing activities like the following example.

Usecase: an auction house owns a large number of works by an artist. Through the RCCC data platform, the auction house traced the recent buyers from Taiwan to the artist's works. So the auction house can hold the auction in Taiwan. The auction house then used RCCC's transaction records to carry out effective promotion and promotion of the artist's works, which greatly promoted the artist's popularity in Taiwan and the value of his artistic works.

Quantify the Value of Art

The value of art is often difficult to quantify using simple rules. It is influenced by many factors, such as exhibitions of artwork, publications and awards, or transaction price records from major markets and auction houses. In addition to these quantifiable standards, the value of artwork often fluctuates along with the economic conditions of society or social trends. Therefore, it is difficult to define whether a work of art has value or how much the value is.

Usecase: a collector from Chongqing inherited a porcelain bowl from his father, but he did not have much confidence in the value of the porcelain bowl. With the help of the RCCC platform, this work of art was expertly appraised and commented on the RCCC platform. At the same time, it also attracted a lot of platform users who liked this artwork. Through the trade records of the RCCC platform and similar works of art, he clearly saw this type of artwork very popular. He understood the value of this artwork and finally sold it at a satisfactory price.



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RCCC Token Economy

Traceability, Appraise and Trade

RCCC tokens are digital assets that are distributed on the blockchain, so users can own, trade, and use the tokens in exchange for services on various applications in the blockchain. The RCCC token is an important part of the traceability of the artwork and the identification of the blockchain ecology. The token can help stakeholders to obtain practical and important usage value. At the same time, RCCC tokens can be obtained using mainstream cryptocurrency transactions such as Bitcoin, Ethereum, Litecoin, and ADA. In addition, mainstream cryptocurrency exchanges also support the use of fiat to buy RCCC tokens.

The main usage scenario of RCCC tokens is to obtain various services of the RCCC platform for artworks. Our artwork traceability appraisal platform provides a variety of services related to artwork, and this platform was designed to allow art lovers and industry participants to exchange information quickly and securely and reliably. All artwork sales and purchases on this platform as well as the transfer of assets require RCCC tokens. Specifically, the main usage scenarios of RCCC tokens include:

- Register new users on the platform and authenticate
- Pay for the cost of obtaining artwork traceability information
- Expenses paid to experts for expert appraisals and reviews
- Buying, selling and trading activities such as purchasing artwork and transferring ownership
- Paying for the printing and reproduction of copyrighted artworks
- Paying for to exhibition services
- Participate in exclusive art events and gallery opening days
- Purchase discounted tickets for visiting exhibitions and museums
- Pay for the promotion of artworks
- Get expert opinions and suggestions on artworks

In RCCC token ecology, users can not only use tokens for consumer activities, but can also provide professional services to obtain tokens. For example, users can provide the following services in exchange for RCCC tokens:

- Provide professional opinions and suggestions on artworks
- Answer users' specific questions
- Acting as an arbitrator
- Assess and appraisal artworks
- Confirmation of ownership, location, storage and preservation of assets, etc.
- Provide insurance for artworks

- Provide packaging, transportation and handling services for artworks
- Provide storage facilities for artworks

For art creators or artwork owners, RCCC ecology also rewards them. For example, they receive token income in the following areas:

- Copyright fee
- Cross marketing
- Rewards from consumer contributions

At the same time, RCCC is an art traceability and authentication platform, RCCC token can also be used to issue unique appraisal mark to each art piece registered on the blockchain in order to uniquely identify the art and prevent counterfeiting and abuse. This appraisal mark can confirm the following information of the artwork:

- The identity of the artwork
- Creator identity
- The authenticity of artwork and attributes
- Art location and condition

Because artwork information remains on the blockchain forever, regardless of the sale of the artwork or who owns the artwork or its rights (i.e. derivative works). These attributes are always stored in the blockchain. The ownership of RCCC token can be viewed on the blockchain as proof of ownership of artworks.

EOS-based blockchains broadcast publicly the ownership and transaction records of artworks in the world. Users who own RCCC tokens will become owners of corresponding artworks and have ownership rights of the relevant art assets. These ownership rights are not limited to the sale or lease of artistic assets. RCCC's token owners can create as much derivative products as they see fit, and can create prints or copies, sales rights, display rights according to their purpose and usage cases (e.g. according to galleries, dealers, and artwork distribution Business requirements). RCCC token's price reflects the selling price of the relevant asset. Once the current artwork owner sets its status to "for sale" at a valid price, the token will be available for sale. According to the terms agreed between the buyer and the seller, the sale, rental, lease, auction, insurance and pledge of smart contracts are used. With smart contracts, embedded conditions can be basic or complex. Payments can be made in any popular cryptocurrency or fiat currency, and the currency exchange function on the platform will help convert the currency according to the real-time exchange rates for the seller and the buyer.

We believe that a work of art should not only belong to one owner. Instead, we should allow investors to invest in the share of artworks that they believe are valuable and potentially profitable in the future in order to create more liquidity and benefit more art lovers. Smart contracts on RCCC blockchain will include warehousing, insurance, and auditing as part of the stock investment model in art.

For high value artworks, there are many companies that provide special-purpose safe art storage facilities. The high security vault can be run as a gallery or a dedicated room can be used for viewing purposes. These storage facilities usually reside in international designated areas near the international airport so that artworks stored during the transaction will not attract local taxes and therefore be attractive to investors. We will ensure that investors and their delegates have access to the collections stored in these facilities.

The Application of RCCC Tokens in Art Derivatives

Artworks as a special kind of asset can be derived from a variety of sub-assets, such as photo prints, copies, publications, derivative works, signature silver gelatin photos and black-and-white prints, file pigment prints, expensive black-and-white print signature platinum version, paintings and other prints. Artwork derivatives must be linked to the original artwork. When it is not sold, it can be cancelled by the owner. RCCC token owners are free to create and sell these tokens, granting print copies and certain derivative rights, such as the digital printing of the no.xyz artwork. The benefits of these tokens include the fact that artwork owners do not have to sell their artwork, but they can continue to sell the right and license, resulting in a steady stream of revenue. There can be many art derivatives with different permissions for any single artwork. For example, a derivative license may allow a certain number of copies to be printed on the canvas within a year, and another license may allow for printing N copies without time restrictions.

If an artwork is unsaleable, the buyer can still purchase derivatives or prints of the work under the conditions allowed by the artwork owner. In this case, the buyer can make a request and the owner of the artwork can accept or reject the request. In the case of acceptance, a specific number of RCCC tokens will be transferred to the artwork owner's account and specific authority is granted to the buyer. The entire process, including the currency payment and permission transmissions, will be stored in the blockchain through smart contracts.

The arbitration function in the platform guarantees the completion of the terms of the transaction between the buyer and the seller and resolves conflicts between art creators and appraisal experts by hiring qualified and pre-approved arbitrators. In the event of a dispute, the parties related to the transaction may use an arbitration mechanism. Arbitration costs will be determined by the transaction amount. Each arbitrator will state an independent decision, and the overall result will be based on the arbitrator's personal rating and the majority votes. If the transaction cannot be not completed, the funds will be returned to the buyer. The arbitration algorithm is briefly described as follows:

- The system selects N arbitrators from the pool of pre-approved arbitrators
- Buyer and seller submit opinions on this issue
- Each arbitrator independently decides and submits their opinions on this issue
- The arbitrators vote and the result is determined by the weighted majority vote
- Each arbitrator has an individual rating, and the decision of the higher-ranking arbitrator is more weighted and regarded as more reliable

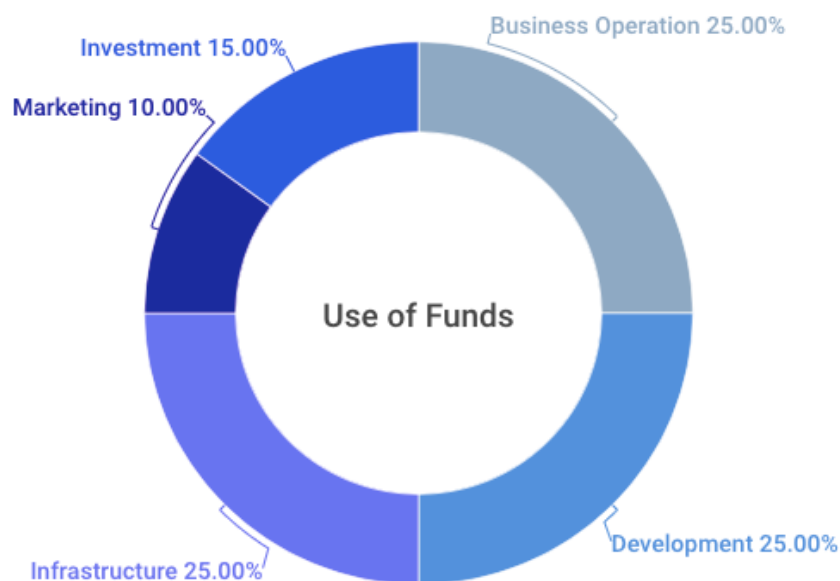
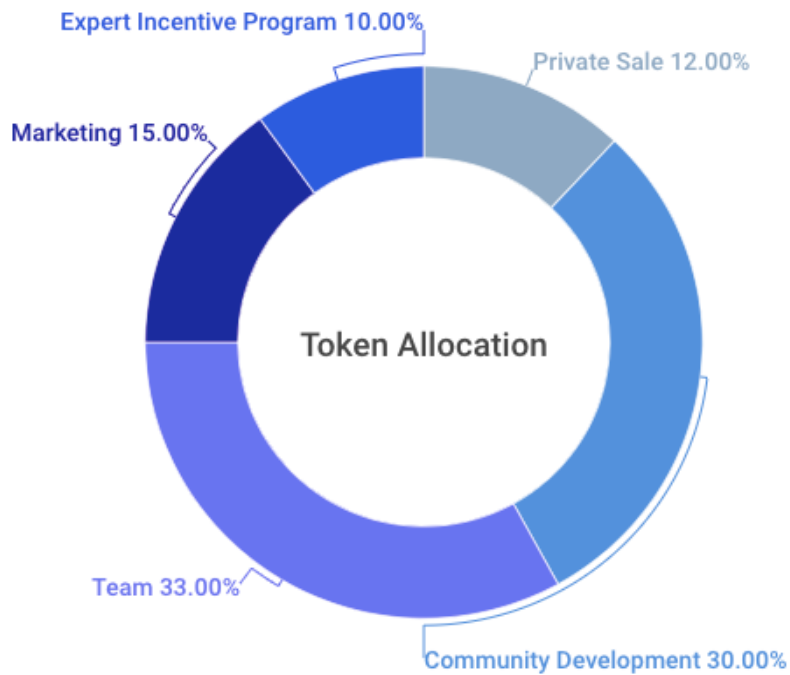
Token Supply and Demand

During the sale of RCCC tokens, the number of tokens issued is limited, and the contributors to token sales will be the initial token holders. Given that supply is fixed, as more and more people are interested in RCCC ecology, tokens will be appreciated based on the evolution of supply and demand, leading to higher RCCC prices. To prevent scarcity, RCCC meets high demand by providing new users with reserved tokens. In addition RCCC can also be divided into smaller units to prevent potential liquidity problems.

In order to encourage users to use RCCC tokens, we encourage users to actively participate in the construction of RCCC ecology by continuously providing innovative functions, rewards, and discount information for artwork services. Providing discounts on RCCC platform services encourages a large number of new users from non-encrypted currency communities to purchase and retain a certain amount of tokens. Users paying with fiat do not have token wallets from the RCCC ecosystem and therefore do not benefit from RCCC token holders' exclusive discounts. In addition, users with a large number of RCCC tokens will enjoy special offers. For example, art experts can receive awards on the platform for providing their professional advice, appraisal review, and artwork recognition services. In order to motivate such art experts and arbitrator communities to provide the best services, RCCC will distribute tokens from the reserve to the largest contributor (i.e., the user with the highest positive rating received in a given period of time). In addition, since timely feedback is important for the sales process of artworks, art critics and professionals will receive a certain amount of token rewards when they release high-quality reviews of artworks. The quality of the assessment will be voted and evaluated by the RCCC community.

Initial Coin Offering (ICO)

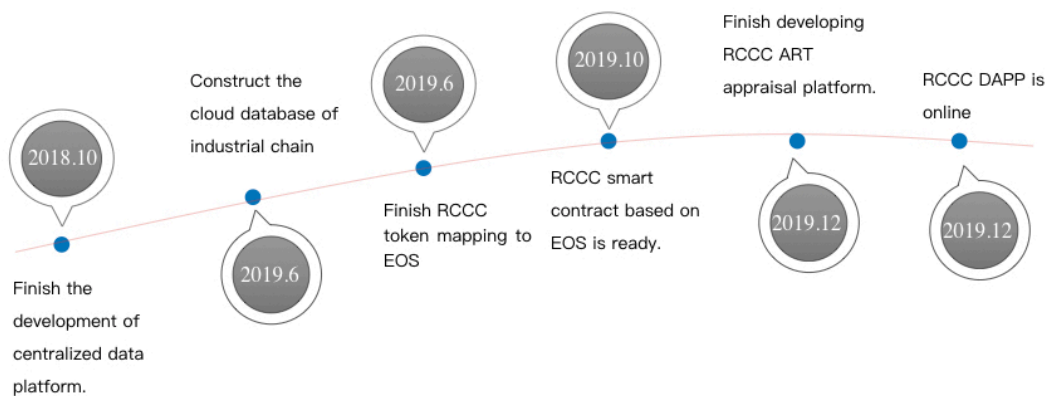
The total number of RCCC tokens is 500 million. 12% (60 million RCCC tokens) will be allocated for private sale; 33% will be held by the team; 10% will be used for expert incentives; 30% for community development and 15% for marketing. The usage of funds is as follow, 25% is used for business operations, 25% is used for technology development, 25% is used for infrastructure development, 10% is used for marketing promotion, 15% is used for investment.



Roadmap

RCCC will adopt a two-step strategy. In the first phase, we will release a centralized solution for RCCC 1.0 in the third quarter of 2018, with the main purpose of constructing the ecosystem. On this basis, the preparation of smart contracts and the reconstruction of the transaction layer will be announced in the fourth quarter, and will be commercialized among many cooperative customers.

In the second phase, we will focus on the construction of a decentralized data platform and the development of an EOS based RCCC DAPP to form a new version of RCCC 2.0. At this stage, all the decentralized constructions have been completed and the RCCC tokens will become the only transaction carrier for the entire network.



RCCC Team

Goals of RCCC platform

To become the top5 of the global Arts data platform within one year.

Provides basic blockchain support for all types of ART data center

The RCCC platform will be internatalized.

Xing Wang

CEO & Co-founder

Has made outstanding achievements in the field of Internet consumption and cultural e-commerce. He is well versed in the digitized operation of art e-commerce, operations, and art assets. Senior big data experts.Has rich experience in large-scale enterprise software development and management. Chinese Australian.

Piter Stephen

CTO

Piter Stephen is a senior computer research engineer. He has been engaged in the field of blockchain research for many years. Has extensive experience in blockchain technology and IT field. Has been responsible for multiple blockchain projects, and has over 25 years of experience in technical consulting.

John Flores

Big Data Consultant

Graduate from University of Queensland.Customer Focused Technologist and Data Science Leader with Strong Commercial Acumen and aPassion for Digital Innovation and Transformation.

Zobi Adar

Business Operation Director Planning Director

Zobi used to be blockchain analyst at Blockchain Capitalist. He manages the world's premier blockchain payment company Specialties:TMT, Fintech, Robo-Advisor, Blockchain, eCommerce, Marketplace, B2C, C2C, Cross-border,Mergers & Acquisitions, Fundraising, Corporate Development, Investor Relations.

Xiaoping Su

Has more than 5 years of corporate planning experience. Has a strong ability to resist pressure,adapt to different occasions, adaptability, active work, and strong appeal.A number of planning cases were shared by the industry as successful experiences. Chinese Australian.

Cathleen John

Fashion Design Instructor

Fashion Consultant and Lecturer and to work as a Collection Director and Lecturer in Melbourne.

Shousong Wang

General Counsel

Senior advisers of the Netherlands Working Group of the China Development Bank, Director of the European Commission for Cultural Affairs, Chairman of the Chinese Overseas Chinese Poverty Alleviation Foundation of China and President of the Chinese Calligraphers and Painters Association.

George Steem

Technical Engineer

Quality Improvement Consultant At Melbourne, Australia. ANCA Machine ToolsMonash University Has its own unique insights in mechanical engineering and industrial design, and has an industry-leading position.

Advantages

Q Products

The team has been working in the field of data platform system for many years. We have mature solutions in design, implementation and promotion of the platform, as well as the design of relevant big data monitoring platform.

A Technology

Over many years, the team has accumulated in artificial intelligence and promotion of big data. In combination with the data platform system and the block chain technology.

Q Customers

The team has already served millions of global users.The customer has a strong demand for high quality art data platform.

RCCC Team

Ablmad Sokkarky

Technical Engineer

Ablmad was a blockchain developer at wiki. He is a full stack developer with 14 years of experience and over 30 projects with multinational companies worldwide. He is an expert in programming languages as GoLang, NodeJs, C++,C. React,etc. He has 2-year experience in Solidity and Ethereum related programming.

Aduk Pinch

Technologies Consultant

Education and Business Strategy Consultant at the Melbourne Blockchain Centre and Intraverse Blockchain Technologies. Blockchain Educator and Business Strategy Consultant. Leading workshops and consulting on the application of Blockchain technology to a range of corporate and community issues.



RCCC