Decentralized Global Digital Copyrights Asset Trading System

Blockchain Project White Paper

CATALOG

1. Market Analysis

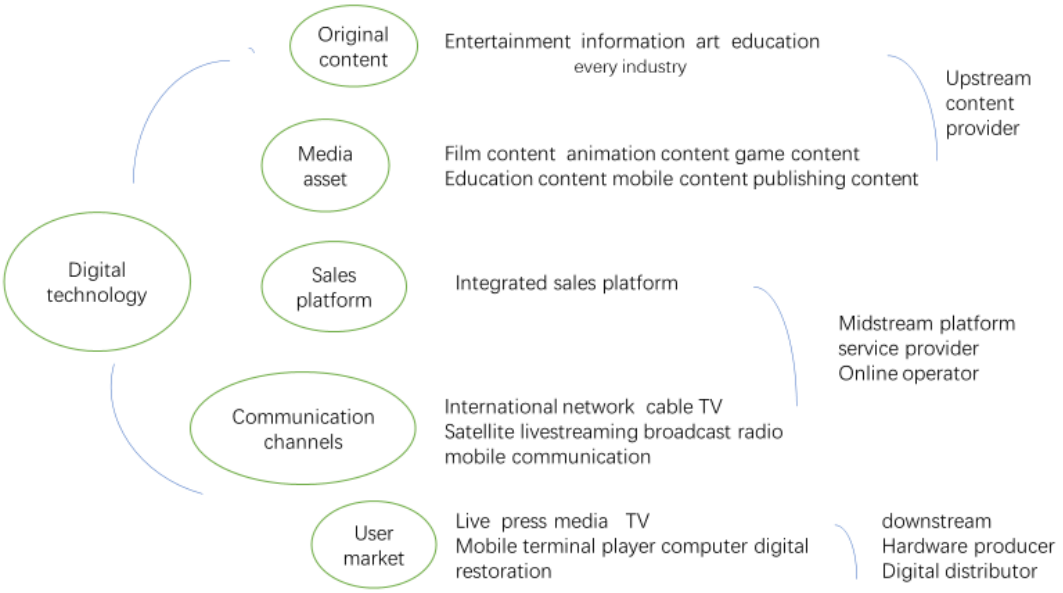
IP is an acronym for Intellectual Property. It is literally translated as "Intellectual Property." The World Intellectual Property Organization defines IP works as "intellectually created achievements: inventions, literary and artistic works, exterior designs, symbols, names and images used in commerce, etc." Copyright in intellectual property includes movies, texts, dictation, music, drama, geisha, dance, acrobatics, fine arts, architecture, photography, graphics, models, and computer software. After the wave of the Internet has engulfed the world, a deep integration of culture and technology gave birth to the digital copyright industry. The digital copyright industry conducts digital content development, visual design, planning, and creative services through technology, creativity, and industrialization. It uses digital technologies for content editing and processing, and disseminates digital content copyright works through the Internet.

1.1 Digital Copyright Industry is a trillion-tier market

Digital Copyright Industry is a strategic emerging industry that takes cultural creativity as its core and digital technology as its carrier. It is a new economic form stemming from the integration of modern information technology and cultural and creative industries. It involves online literature, animation, film and television, games, and creative design, VR, online education and many other segments. Currently, major economies around the world are in the stage of oversupply, and the growth in both external exports and household consumption has slowed down. According to the experience of developed countries, the cultural industry will experience explosive growth if the per capita GDP exceeds 8,000 US dollars. The digital copyright industry will become a global strategic emerging industry.

At present, the digital copyright industry in the UK accounts for 8% of GDP, ranking first in the world. 15% of global music and 16% of global video games are from the United Kingdom; digital copyright industry in the United States accounts for 4% of GDP, and 1/3 of global box office are from the United States; digital copyright industry in Japan accounts for 2.4% of GDP, of which animation production accounted for 60% of the global share. The relevant data from Research Report on China's Internet Copyright Industry Development shows that China's online copyright industry market scale reached 636.45 billion in 2017, up 27% year-on-year.

At the same time, a more diversified group of participants are involved in digital copyright industry. At present, a complete upstream and downstream structure has been formed, mainly composed of upstream digital content providers, midstream platform service providers, network operators, downstream hardware manufacturers, and digital distributors.



1.2 Analysis of Industrial pain points

1.2.1 The piracy issue is still rampant.

On the one hand, although the problem of cyber piracy of traditional digital content has been curbed, cyber piracy has taken place in emerging digital copyright content such as virtual reality, augmented reality, holographic imaging, naked-eye 3D, interactive entertainment engine development, digital processing of cultural resources, interactive film and television, etc. There is no effective solution yet. On the other hand, most countries in the world have already concluded relevant international conventions, and the World Intellectual Property Organization has spared no effort to promote international copyright economic cooperation. However, because it is difficult for different countries to collaborate on cross-border copyright protection, the issue of piracy is very serious across the world.

1.2.2 The traditional copyright registration mode is not applicable to the digital copyright industry.

In the traditional copyright registration process, there exist problems such as lack of acceptance sites, long processing cycles, and high economic costs. Coupled with the fact that the copyright protection agencies are not cooperating, the data is not synchronized in real time, and it is difficult to prevent the occurrence of an “imposter” incident. With the increasing of original works, the traditional registration authentication method is showing more and more disadvantages.

1.2.3 Commercial institutions have a congenital defect.

The number of Internet copyright protection products has increased. The universal way of “confirming the right” is to use the “time stamp” technique to store the relevant abstract information of the work, and the stored data is stored in a centralized institution. Copyright laws of sovereign countries generally stipulate that copyright holders are

protected by law for a long period of time (for example, China is 50 years). If this central agency does not last long enough, these products may not exist before the originator claims their rights.

1.2.4 Copyright trading is inefficient.

IP licensing is now distributed in accordance with the umbrella structure and regulated through the paper agreement in accordance with the contract law with many intermediate links. Cross-licensing, over-range authorization, false authorization, fraudulent settlement is difficult to avoid. And because of the limitations of the company's life cycle and operations, the copyright agency chain is very easy to discontinue.

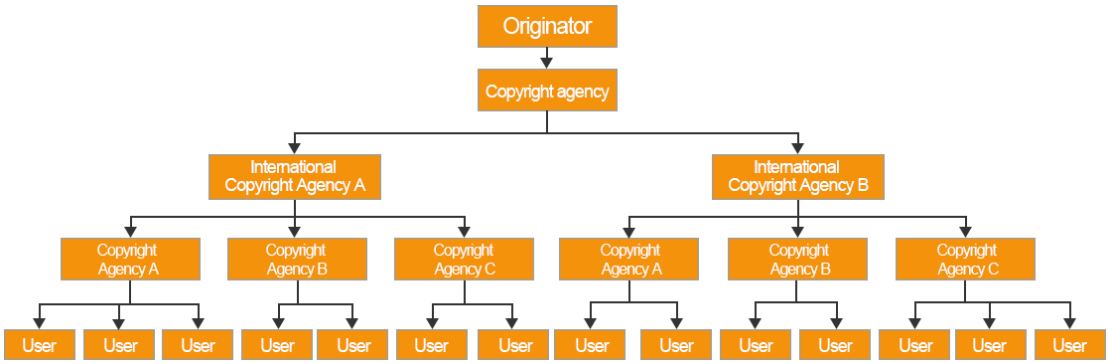


Figure: Schematic diagram of the traditional copyright distribution

1.2.5 Long period and high costs of rights protection.

Due to the current long period of traditional rights protection (usually 6-9 months), difficulty in collecting evidence and other objective factors, many original creators often give up the right to fight against piracy.

2. Vision

2.1 Blockchain: the best way to protect copyright.

Blockchain is a decentralized and de-trusted distributed ledger technology. It is composed of distributed data storage, point-to-point transmission, consensus mechanism, and encryption algorithms. Blockchain has been successfully applied in the financial sector. Copyright is another big application scenario of blockchain technology.

2.1.1 Copyright asset management can be carried out through blockchain.

Copyright is a property right that has been abstracted from the works, and it can realize the copyright assets uplink. Copyright management is also highly distributed, autonomous, contracted, and traceable. Like copyrights, equity, claims, options, and property rights, copyright can be involved in operations and direct realization of value through assessment, mortgage, transfer, sales, investment, licensing, etc.

2.1.2 Blockchain technology solves the problem in copyright asset transactions.

Traditional digital technologies and internet technologies can solve the issue of file distribution, but transactions are not transparent and rights cannot be guaranteed. By linking all the original creators and copyright users directly through the blockchain, the intermediate links are reduced and distribution is realized. This will bring a vast market space for the copyright industry. At the same time, the blockchain-based copyright trading platform will be transparent and sustainable, and the value of IP will be gradually amplified due to long-term operations.

2.1.3 Blockchain technology can achieve closed-loop copyright management.

Through the installation of DAPP, the controlled use of copyrighted works can be achieved, and the strict correspondence between copyright authorization and copyright use can be implemented according to uses, the use channels, use period, and the precise control of the used area, ensuring that the rights of the original creator are fully protected.

2.1.4 Blockchain technology can integrate global anti-piracy resources.

Anti-piracy has always existed in a centralized manner. Commercial organizations build their own monitoring clusters and complete the collection of piracy clues. With blockchain technology, it is possible to integrate the remaining computing power of the global computer into a globally integrated anti-piracy monitoring network.

2.2 Mission of “DCAex.io”

DCAex.io hopes to reshape the value ecosphere of global digital creative industry, empower content originators, search for potential copyright brokers, and help originators finish the realization of copyrights of works so as to get rid of the simple labor export and realize the wealth freedom.

DCAex.io is committed to establishing a transparent, decentralized and international innovation-valued community and driving the authorized trading, so that every participating vertical content platform can get rid of the ethical dilemma posed by piracy and share the fruits of copyright realization.

3. Project Introduction

3.1 Overview of "DCAex"

DCAex.io is a decentralized global digital rights asset trading system with its headquarters located in Canada, aiming to provide such basic functional services as copyright protection, copyright trading, copyright retrieval, infringement monitoring, rights protection assistance, etc. for original creators with great commercial potential worldwide. Any organization or individual can use the trusted digital identity to publish digital creative works on DCAex.io and make them trusted, protected and sharable digital rights assets. By utilizing the distributed management mechanism of blockchain technology, DCAex.io allows copyright brokers to use all functional modules to build their own fast and transparent digital creative cultural asset platform. In the future, DCAex.io will focus on the development and operation of securitization exchanges for digital copyright assets around the world.

DCAex.io attaches great importance to digital content, especially the emerging digital creative fields, such as virtual reality, augmented reality, holographic imaging, naked-eye 3D, interactive engines, IPTV. In 2018, DCAex.io will be applied in creative design, digital imaging, and online education, and take the lead to provide copyright services for designers, photographers, artists, network teachers and institutions. Later, DCAex.io will expand other applications in the cultural industry, e.g. virtual reality, augmented reality, and holographic imaging.

DCAex.io uses blockchain technology to integrate and speed up various links of industrial chain, thus effectively shortening the value realization cycle of copyrighted works, and keeping abreast of the works of creators to ensure the authenticity and uniqueness of ownership. By recording the transaction of works in real time, the entire life cycle management of the digital creative works can be realized. DCAex.io will cooperate with the official copyright management agencies of various countries to provide technical guarantees for judicial evidence collection. It is facing the vertical content platform and will provide point-to-point cross-platform content distribution and transparent copyright clearance and accounting services.

DCAex.io is a blockchain application system targeting in the commercial bottom platform at the initial stage. At present, all business development of generic copyright services and negotiation with clients in typical industry application has been accomplished. In Nov. 2018, one test application platform based on this system will be launched.

3.2 Solution to digital copyright issue

3.2.1 Solve cross-border copyright distribution and rights issues, and realize global IP business

The DCAex.io team has conducted business communications with partners in China, South Korea, Thailand, Malaysia and Canada, hunting for originators with great global potential, using blockchain technology for real-time worldwide distribution of works

copyrights, and work together with local copyright protection departments to achieve regional protection for the works.

3.2.2 Review substantially to solve the problem of copyright works registration

The DCAex.io team has independently developed a file gene extraction and comparison technology that supports digital files in various formats like photo, video, audio and text, and can search 100 million photo galleries per second to ensure that the works are substantively tested and the file gene is encrypted into Blockchain books. Originators at home can enjoy 7 * 24 hours online copyright protection services. It takes only a few minutes to complete a copyright registration application for a work. At the same time, DCAex.io can provide web site with copyright internet infrastructure services, to access to any one site through API, so that massive content can be genuine.

3.2.3 Reduction of distribution links, and transparency of transaction

DCAex.io has changed the traditional "umbrella structure" and adopted a more flattened authorization method, allowing "brokers" to create more vertical content copyright trading platforms and original users to directly face IP buyers through a series of smart contracts and transparent settlement. This model will greatly increase the income of the original creator and will also make the authorization behavior more credible and controllable. The entire process cannot be changed.

3.2.4 Solve the problem of online piracy and difficulty in finding infringement clues in time.

Cyber piracy discourages content creators. A few people deliberately crawl and synthesize copyrighted works under the disguise of “innovation” and “sharing”. Content creators rely on creation to sell their own creations and copyrights, which is the most important channel for content creators. For the digital copyright industry, piracy has become the biggest culprit hindering the development of the entire industry. DCAex.io integrates global computer computing capabilities, builds a distributed anti-piracy monitoring network and case mediation platform, stores infringement data via blockchain, and commissions related organizations to provide rights protection services for original creators and help originators to maintain their legitimate rights and interests.

3.3 Competitor Analysis

Since the technical characteristics of the blockchain are inherently used for digital asset management, copyright is also a major form of digital asset. Several entrepreneurial projects involving copyright have emerged in the area of blockchain. At the technical level, most of the related projects only apply underlying blockchain technology and build a basic “certification storage” model. The business model is still a loop to be systemized.

Monegraph is Pryor Cashman's new digital art and media platform using blockchain technology. Through the platform, various types of creators can easily build smart contracts and licenses for the commercial value of their digital work, simplify the processing of licensing, payment processing, media processing and distribution, and

assist right holders in obtaining the appropriate commercial remuneration for works.

Colu aims to transfer ownership through blockchain technology. The cooperation between Colu and Revelator simplified the music copyright and verification steps, allowing artists to manage and track their music directly. Revelator is a cloud-based information provider that specializes in providing sales, market intelligence and smart music services to independent musicians and is a leader in the music technology industry.

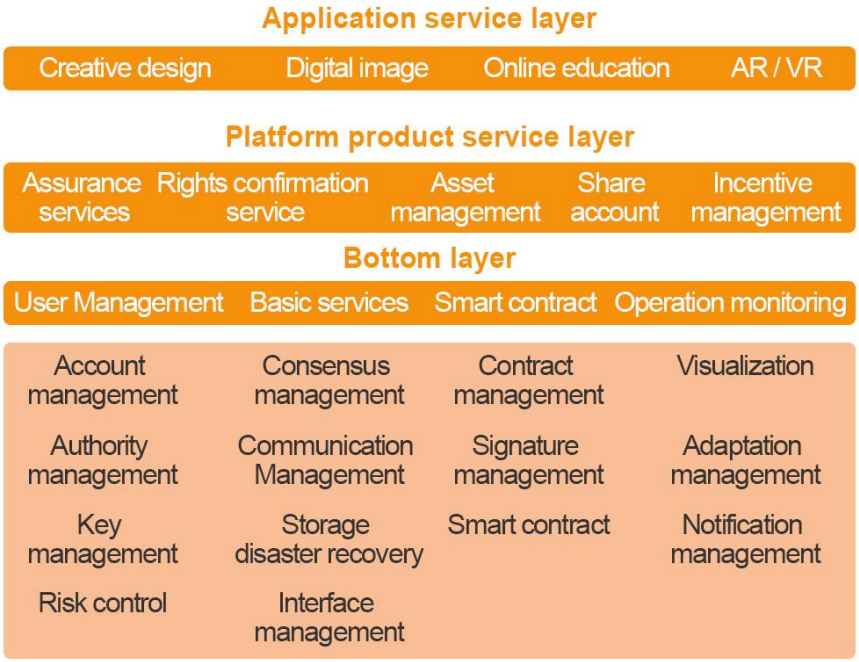
DCAex.io has its own unique advantages over other projects. DCAex.io uses a unique file gene extraction and rapid comparison technology in the certification of registration, more in line with the application scenario of copyright. In terms of business model, DCAex.io introduces in “copyright broker”, emphasizes the acquisition of the head content of each segment and helps originators to turn future copyright earnings into current earnings. A digital copyright assets exchange will also be built to achieve financialization and securitization of copyright assets.

4. Solution

The introduction of blockchain technology has greatly improved the operation efficiency of copyright service. Sophisticated issues on copyright can be solved from three aspects: confirmation of rights, licensing and protection of rights.

4.1 Technical Structure

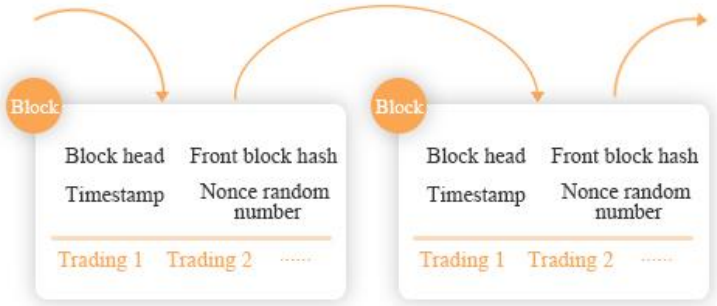
DCAex.io blockchain application system is mainly composed of three levels: the bottom layer of the system, platform product service layer and application service layer. The bottom layer is built the basic service and operation mechanism of DCAex.io based on DAG technology framework, and the platform product service layer packages the DCAex.io platform into an API interface for providing services on the bottom layer basis. Application service layer focuses on segments of each digital creative industry.



4.1.1 Blockchain bottom platform

The DCAex.io block data is stored in a chain structure. All the blocks have a pointer reference to the previous block to ensure that the data is not tampered with. The SHA-256 function is used to hash the file gene again, ECC asymmetric encryption algorithm is used for authentication, AES encryption algorithm is used to encrypt the private key and Merkle is used for authentication and storage transactions. User management covers management of all the originators identity information, including the maintenance of public and private key generation, key storage management. The underlying service is deployed on all nodes of the blockchain to verify the validity of the service request and record the valid request on the storage after consensus has been reached. Smart contracts are responsible for registering, issuing, triggering, and executing copyright contracts. Operation monitoring means taking the charge in

deployment, configuration modification and contract set-up in product release and output of visualized real-time state during product operation.



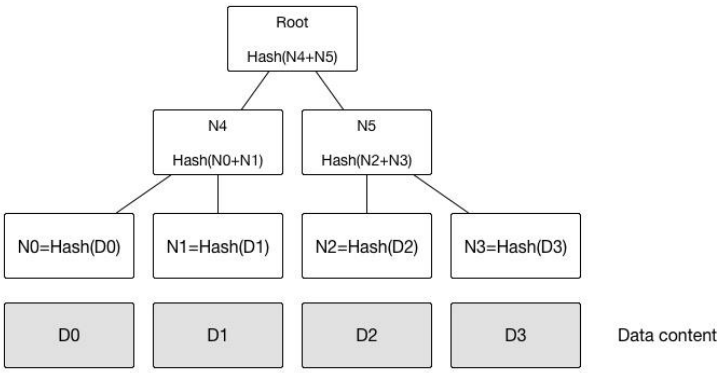
4.1.1.1 User Management

Users can create identities through DCAex.io and can authorize third parties to inquire or use them after getting privileged user identities and use them for digital rights confirmation and trading entity. The author of the user uses the private key to realize the registration of the work, the transaction control, and authorizes the third party to call the data storage module interface through the API interface to ensure the control of the contract and the copyright transaction; on the other hand, the external certification authority and the external client can also use the private key to sign on digital copyright and endorse user authentication through public key verification.

DCAex.io uses ECC asymmetric encryption algorithm to verify identity and AES encryption algorithm to encrypt user's corresponding private key, which balances the final solutions of software implementation, hardware implementation, and space-time resource occupation and other factors. It has mathematically provable security. Therefore, applying AES helps to reduce the workload and mistakes in user information security management. From a security perspective, 128-bit and above AES have not been cracked.

4.1.1.2 Merkle transaction verification

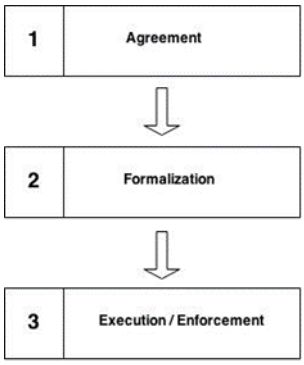
Merkle is used to validate transactions and each block contains a Merkle root, which is calculated from repeated transactions of multiple transactions by the standard of ERC20. If a block contains N transactions, each transaction can generate a hash value. The N hash values combine to generate N/2 hash, and then the two hashes get a hash value after performing a hash calculation. This hash value is the root of the Merkle tree.



When the user wants to determine the status of a digital copyright transaction, as long as the other party is required to provide a Merkel certificate, that is, to obtain a specific transaction, the root of the Merkel tree at the exchange is the block header, and the DCAex.io client will synchronize the latest transaction data to ensure the validity and security of the verified transaction.

4.1.1.3 Smart Contract

Blockchain-based smart contracts include transaction processing and storage mechanisms, as well as a complete state machine for accepting and processing various smart contracts. Storage and state processing of transactions are carried out on the blockchain. Transactions mainly include data that needs to be sent, and events are descriptions of these data. After the transaction and event information is passed to the smart contract, the resource status in the contract resource set will be updated, triggering the smart contract to perform state machine judgment. If the triggering condition of one or more actions in the DCAex.io chain is met, the contract is automatically executed by the state machine according to the preset information.



First registered on the DCAex.io chain, the blockchain returns a pair of public and private keys to the user; the public key serves as the user's account address on the blockchain, and the private key serves as the only key to operate the account. In light of actual needs, two or more users jointly agree on a commitment to stipulate the agreement on digital copyrights; these digital copyrights are embodied in an electronic way, programmed machine language; participants sign with their respective private keys; Ensure the validity of the contract. The signed smart contract will be transmitted to the blockchain network according to the promised content.

4.1.1.3 Blockchain API

The plan will provide API interfaces such as restful, rpc, websocket, etc. It can be called blockchain services.

4.1.2 Platform Product Service Layer

The product service layer is DCAex.io in the specific application of the digital copyright industry, providing the basic capabilities and implementation framework for typical applications. Based on this, the project user can easily complete the blockchain implementation of the business logic by combining the unique features of his own

business. It can help users to quickly build business scenarios and solve difficult problems by harnessing the properties of the blockchain, such as tamper-resistance and traceability.

4.1.2.1 Deposit Service

Blockchain technology has features such as decentralization, full data transparency, and tamper-resistance. In the DCAex.io technical solution, let any number of user nodes participating in the system calculate the copyright information data in the system for a period of time through a cryptographic algorithm, record it into a data block, and generate a fingerprint for the data block. Link the next data block and checksum, and all participating nodes of the system jointly determine whether the record is true. Through the depository service, the original creator publishes his work on the blockchain, so that all the witness nodes of the witness jointly testify for themselves.

4.1.2.2 Right confirmation service

On the technical level, based on cryptography, the RSA encryption scheme and the decryption scheme are adopted, the creator uploads the work to obtain the private key, the digital rights asset data is encrypted through the public key generated by the DCAex.io platform, and the confirmed copyright must pass. The author's private key can only be decrypted. Having absolute control over the private key of a digitally-encrypted asset can be used to decipher it, so that the asset can be claimed. A private key means a digital asset.

The RSA public-key cryptosystem adopted by DCAex.io contains the following three algorithms: Key Gen (Key Generation Algorithm), Encrypt (Encryption Algorithm), and Decrypt (Decryption Algorithm).

$$(PK, SK) \leftarrow KeyGen(\lambda)$$

The creator takes the security constant λ as input, and DCAex.io outputs a public key PK, and a private key SK. The larger λ is, the larger the prime number p is, which ensures the system has higher security. The key generation algorithm is as follows: The algorithm first randomly generates two different large prime numbers p and q and calculates N=pq. Then, the algorithm calculates the Euler function. Next, the algorithm randomly selects an integer e that is less than and computes e on the modulo element d. Finally, the public key is PK=(N, e) and the private key is SK=(N, d)

$$CT \leftarrow Encrypt(PK, M)$$

The digital copyright encryption algorithm takes the public key PK and the message M to be encrypted as input and outputs a ciphertext CT. In RSA, the encryption algorithm is as follows: The algorithm directly outputs the ciphertext as $CT = M^e \bmod N$.

$$M \leftarrow Decrypt(SK, CT)$$

The DCAex.io digital rights decryption takes the private key SK and the ciphertext CT as input and outputs the message M. In RSA, the decryption algorithm is as follows:

The algorithm directly outputs the plain text as $M = CT^d \bmod N$. Since e and d are inverse, we have: $CT^d = M^{ed} = M \bmod N$.

At the real scene level, it is through the rules in the centralized management system, such as certificates, contracts, contracts, etc., to realize the right. The key to achieving the full real name system at the first place is the key, and this is exactly the advantage of "DCAex.io". At the same time, DCAex.io will guarantee the long-term protection of copyright through effective management of private keys.

4.1.2.3 Asset Management

Set the use price of copyrighted works, the scope of authorization, the proportion of channels to be divided, cash withdrawals and other operations, and strictly control the public and private key system of accounts, and all operations will have signature verification, both parties will leave marks, cannot be deleted. In order to build a fully ecological management model of digital copyright assets, it will increase the income of creators from the aspects of asset preservation, asset realization, and asset conversion, while protecting the rights of creators.

4.1.2.4 Shared Accounts

The shared ledger of DCAex.io is a distributed decentralized ledger, and the transaction records of the copyright buyer and seller are all docked to the blockchain. In order to be able to quickly trace the entire authorization process of copyright, it is also guaranteed that every data cannot be tampered with. Creating a transaction on DCAex.io requires three steps: signing the transaction on the node; node selecting two unconfirmed transactions using the RWMC algorithm when creating a new transaction; checking the transaction Conflicts and proof of work. DCAex.io uses the Merkle Tree algorithm to perform Hash operations on each block that records transaction records so that the reconciliation can be performed at any time, realizing near-real-time transaction confirmation and fund transfer.

4.1.2.5 Incentive Management

The DCAex.io distribution plan has a community promotion fund that is designed to attract users to join the community and value transmission and asset exchange within the community system. According to the data contributed by the participating parties, according to certain rules, the original creators will be rewarded for publishing high-quality works, supporting various community activities such as organizing various digital creative classes, so as to cultivate more community members and excavate outstanding creative ideas and teams. data-based services of DCAex.io foster more blockchain applications and actively promote the overall prosperity of the digital creative culture ecosystem.

It should be particularly pointed out that although the blockchain is anonymous, in the copyright application scenario, both sides of the copyright sale and purchase need real name support. Because in the current environment, infringement does not happen anymore, and it is necessary to preserve the truth and ensure the rights and interests of

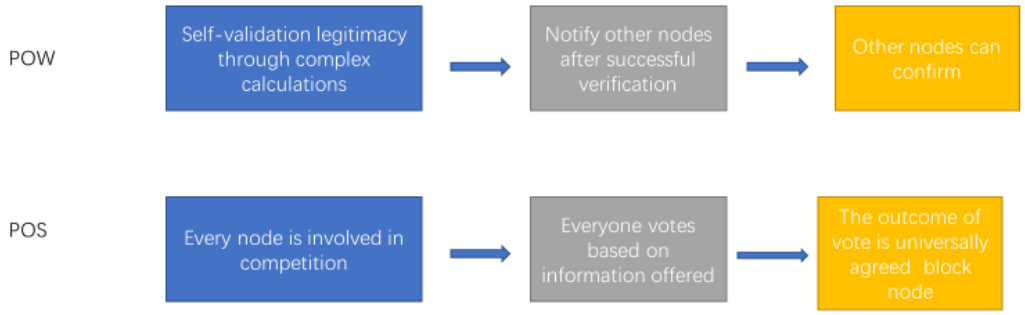
buyers and sellers, it is necessary to make a clear and irrevocable record of the authorization of the work. When the user uses "DCA" to purchase the copyright, the system will only write the user's public key address information into the blockchain. Therefore, from the perspective of "DCA" flow, the information of both parties is still peer-to-peer, anonymous, and traceable.

4.1.3 Application Service Layer

DCAex.io is positioned in the business application system. In the early stage, it will provide a common application protocol at the bottom layer, introduce the landing projects in different vertical fields as soon as possible, and realize the function transformation of DCAex.io from the copyright protection tool to the copyright trading platform. DCAex.io will provide algorithms for the extraction and comparison of document genes and gene bank data interfaces, providing blockchain certificate storage interfaces, official copyright registration interfaces, copyright retrieval interfaces, copyright monitoring algorithms and interfaces, and copyright authorization traceability interfaces.

4.2 Consensus mechanism

DCAex.io combines data identification methods such as DPOS (Delegated Proof of Stake), POW (Proof of Work), and proof of infringement. Both DPOS and POW are used in different business scenarios of copyright protection.



DPOS is used to store data such as the creation of original works and the transaction of copyrights. Due to the large number of works and subjects involved in copyright transactions, and the nonidentity of originators and programmers, long-run availability of device connected to the blockchain can't be guaranteed. So, DCAex.io did not adopt the typical PoW mechanism but adopted a witness mechanism with reference to the DPoS mechanism. The witness can testify about the generated blocks. Each user who realizes the copyright transactions on that day can vote for witnesses on the basis of the amount of his transaction, and the top 101 (in principle subject to the number of active users in the community) who receive the total number of votes for approval can be elected as witnesses. The witness's candidate list is updated once a day and each witness hold the same weight. Blocks are generated randomly. If not completed within the stipulated time, the block witness authority will be transferred to the subsequent corresponding witnesses. The newly created block is broadcasted to the network and the transaction is confirmed after the witness testifies about the block.

Witness mechanism reach a consensus in a fair and democratic manner, and users who realize copyright trading can vote at any time to replace witnesses. In order to be a witness, community users must publish their own outstanding works to promote copyright transactions, but also, they must go to the community to actively ask votes and mortgage a certain amount of Token.

POW presents digital copyright infringement results to users through computer nodes and verifies them in a calculated form. By verifying this result, anyone can confirm that the prover performs a certain amount of work to produce this result.

4.3 DAPP Functions and Business Model

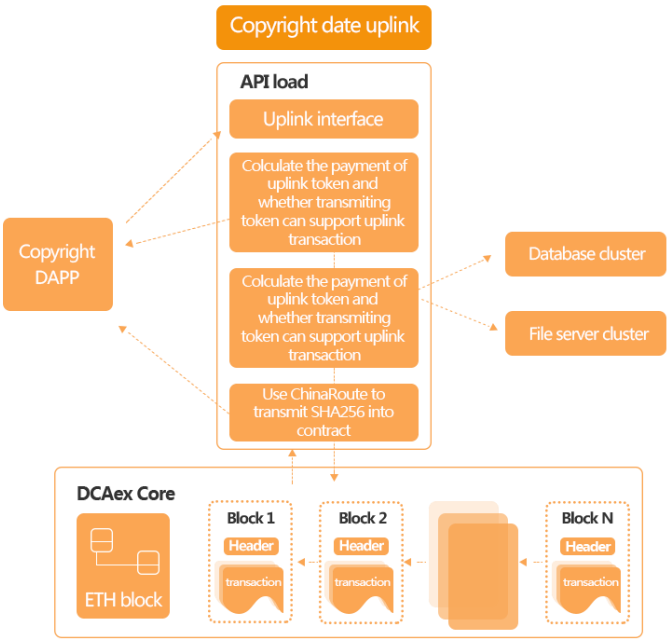
The DCAex.io team will carry out technological developments at the application layer of copyright protection general tools, copyright exchange management, and community construction. It will use digital copyright protection technology systems for digital visual works to realize copyright registration and copyright registration. Technical cooperation in all aspects of copyright transactions, copyright monitoring, and copyright retrieval.

4.3.1 Decentralized Application Platform

DCAex.io is an open source platform built on a distributed network. Participants of copyright asset transactions can not only guarantee the safe storage of information, but also their ownership as original authors can be confirmed at the entire network node. The data of the DAPP application corresponding to DCAex.io must be encrypted and stored on the public blockchain. It has a Token mechanism (a common Token based on the same underlying blockchain platform such as ERC20, a miner or application maintenance node, and creative works can get token rewards. At the same time, the application of Token produces a strictly standard encryption algorithm.

The DCAex.io user real-name authentication process is more convenient and credible. Under the DAPP scenario, the digital copyright creator transaction security has improved. The traditional way of copyright transactions is inefficient, the cost of credit production is high, and the period of time for ensuring rights and rights is long, and the existence proves difficult. UTXO (Unspent Transaction Output)-based blockchain technology can easily solve this problem. At the same time, the property rights of blockchain data and the two attributes of the value network can change the current production relationship in the intellectual property market. Based on the DAPP platform, digital copyright can be authorized by the copyright owner, and transaction-related fees can be Tokened. Blockchains are assigned to copyright parties and channel parties based on value networks. Within this ecosystem, the cost of copyright scramble will be reduced, the cost of project operation and maintenance will be reduced, and the security and convenience will be further protected.

4.3.2 DAPP login process



4.3.3 The adoption of ERC20 Token

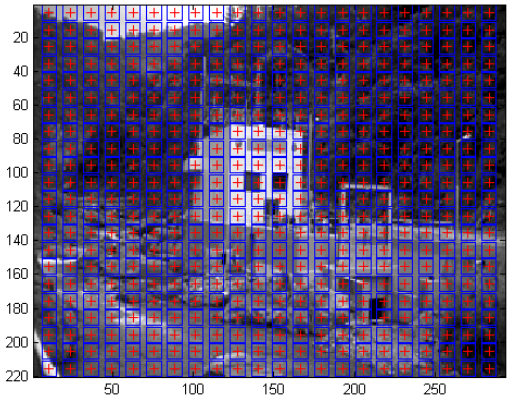
The DCA uses Tokens based on the ERC20, which are easier to exchange and can perform the same work on the DAPP corresponding to the DCA. ERC20's standards allow Token to be more compatible, which allows other features such as vote tokenization. Its operation is more like a voting operation. The Token holder can fully control the assets. The Tokens complying with the ERC20 can track how many Tokens anyone has at any time based on the sub-Tokens of the ETH contract, so it is easy to implement.

5. Application Scenario and Business Model

5.1 Function of confirming rights of works

Digital proof can guarantee the integrity and consistency of data and protect intellectual property rights. Currently, the blockchain copyright asset projects use hash algorithms to extract Hash values from user-uploaded works and utilize “time stamps” to record the certificate on the chain. Although such method has solved the problem of limited block capacity, it misunderstands the meaning of copyrighted works. The works mentioned in the copyright do not depend on the format and size of a particular file. Whether a photo is saved in jpg or bmp, or the size is 1M or 50K, does not affect the copyright owners to exercise their copyrights. According to the current practice, different users can upload works with identical contents but different format or sizes. Second, relying on platform technology to verify the originality of the work is also known as an over-centralized operation, containing the risk of users to use another person's work to “record the certificate”. This has obviously threatened the core basis of the entire blockchain copyright projects, i.e. trust.

DCAex.io independently develops artificial intelligence technology and implements gene extraction and comparison of images, videos, audios, and text files through a series of combination algorithms such as sift algorithm, clustering algorithm and inverted index. Any user can use this function to store the genes of his/her own work in DCAex.io or compare genes with those of other works. DCAex.io will perform a second-level duplicate checking and quick comparison of the work, which undoubtedly greatly improves the accuracy and efficiency of copyright protection. The original creator can also be protected by blockchain. In addition, DCAex.io allows users with ability to determine the originality of the works in a professional field to be “witnesses” and express their opinions on the originality of the works. With DCAex.io, people can establish a large and decentralized on-line data monitoring library, providing each "witness" with a report on retrieval of works and making it easier for "witnesses" to submit their opinions.



DCAex.io is seeking cooperation with those who are eligible for the copyright registration. In China, DCAex.io has reached a strategic cooperation intention with an official copyright registration agency to help Chinese original creators and foreign original creators who wish to enter the Chinese market, to implement a fast and convenient online copyright registration function. The service changed the registration form of the offline hall to online self-registration, shortened the copyright registration period from two months to several days, and drastically reduced the applicant’s economic costs.

In the future, DCAex.io will provide standard interfaces to other copyright users to help them solve the problems on the effectiveness of copyright tools; open the source of all genetic algorithms and entire gene pool to any developer who wants to optimize the corresponding algorithm, and use tokens to motivate them to carry out the researches on the gene comparison technology of emerging digital file formats, thus allowing more people to participate in the development of DCAex.io.

5.2 Auxiliary pricing function

The traditional copyright trading websites and blockchain copyright projects are both over-centralized. The products are usually priced in 2 methods: Unified Price Setting by Platform and Price Setting by Authors, and it normally takes a very long time for the platform, authors and users to coordinate and balance prices. DCAex.io adopts a "decentralized" pricing strategy, which, in accordance with the category of works, gives users the trading volume of works for their reference when setting the price; for example, if the price is set at RMB 100 and transaction probability is estimated to be 76%, the average turnover is expected to be RMB 480,000. The system also allows users to invite "witnesses" to participate in the pricing; for example, the price is at RMB 100, and 54 witnesses think of it as expensive.

Second, the pricing for the digital copyright of works is different from that of physical goods, involving rights combination. Based on market demand, different types of works come with different combination of rights. For example, the authors of new generation, in order to enhance their popularity, may authorize people to use their works for free in the short term; pictures of material type are more suitable for RF (Royalty-Free) mode of use, that is, users can use them forever after purchase; for the works with high artistic value which just made their debut, it is possible to sigh a buyout agreement; IP images, such as comics, normally comes with the authorization mode of classified license in more cases. In order to promote the trading of copyright assets, DCAex.io will provide a series of smart contracts to allow users to choose any one or several ways to upload their works.

5.3 Copyright trading function

Globally, the trading market for legal digital copyrights is severely plagued by piracy. Among the existing copyright trading platforms, most are the trading platforms of pirated products with unclear copyrights. They use “crawler robots” to collect works circulating on the Internet every day, and sell the copyrights of works without the consent of right holders by sales members or point redemption. Some of these platforms which are transforming to PGC only require up-loaders to make a simple self-declaration and fail to substantively test the originality of the work. Such platforms can only at most solve the problem of “finding pictures”, instead of the problem of copyright. The interests of original creators are completely unprotected, while the purchasers are easy to be brought to court for infringement. At the same time, a small number of legal trading platforms rely on “right protection-based marketing” and “phishing-based marketing” to drive the price up, thus making a picture sold at thousands of yuan or even tens of thousands of yuan in the name of combating piracy.

In order to solve the aforesaid problems, DCAex.io is based on artificial intelligence and blockchain to make the copyright of each digital work very clear. We also allow each user to publish copyright supply tasks by means of token rewards and use smart contracts to manage the multiple copyright product portfolios. We support to transfer the sales model of expensive single items into that of copyright data packages, thereby reducing the economic cost of individual buyers to use the genuine digital works and achieving the goal as everyone can afford to use genuine copies.

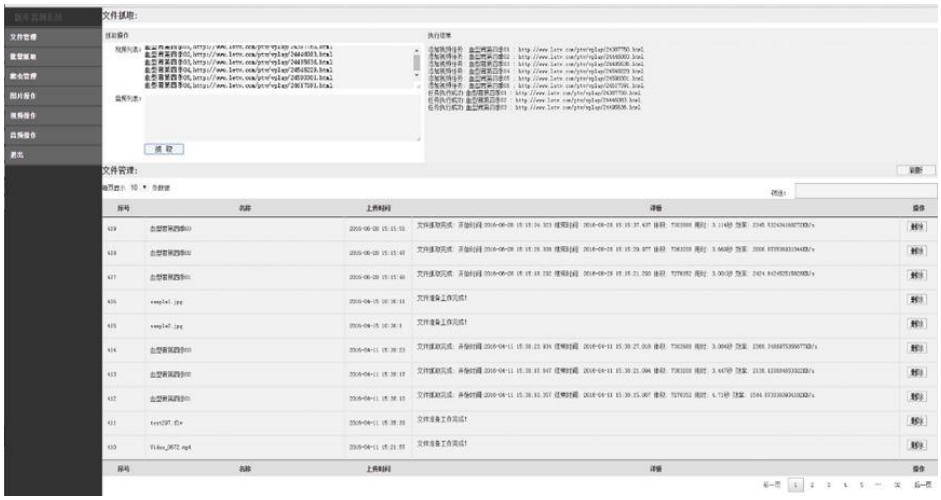
In order to improve the efficiency of copyright transactions, we use AI to perform data processing, such as color recognition, object recognition, and face recognition when users upload their works to DCAex.io and then the system automatically generates more than 10 work labels. We will provide purchasers with tools of “search by graph”, “color search”, “associative search”, and “semantic search”, so that the system can push the desired works to users more precisely.

Globally, the traditional copyright trading platform requires a commission of more than 50%. However, DCAex.io only asks for a 10% commission on the transaction, which enables more proceeds from the transaction to be paid to the original creators, and thus encourage them to create more excellent works. Among such 10% of commission required by DCAex.io, 50% will be transferred to the "recovery reserve fund" for later public acquisition of DCA Tokens in the secondary market.

5.4 Piracy monitoring function

Since digital contents are easily to be copied and distributed by “crawler robots”, copyright infringement happens all the time on the Internet. The original creators are not programmers or lawyers, and therefore unable to detect piracy in time.

At present, the anti-piracy online monitoring business has just emerged around the world. DCAex.io will establish a decentralized online copyright monitoring platform, whose core technology has been independently developed and is now under the testing stage. DCAex.io allows each creator of the ecosphere to submit piracy monitoring tasks and rewards them with tokens. Each user is allowed to undertake monitoring tasks to help provide the rights protection clues, and users successfully finding the piracy clues will participate in reward distribution. DCAex.io will provide users with monitoring engine and basic computing power. We hope those professional users with development capability can join the continuous optimization of monitoring algorithms, and hope more ordinary users will add their terminal devices to the monitoring network and achieve the crowdsourcing function of pirated surveillance. Such “monitoring mining" will use P2Pool; and each mining node works on the shares link. Due to the fact that there is no center, it is unlikely to be attacked by DoS, and the block on which each node is working includes the DCA Tokens paid to the owners of the previous shares and the node. 99% of the rewards will be evenly distributed to the miners, and the remaining 1% will be awarded to the people who make the block. Unlike the other blockchain mining, the monitoring miners have no authority to generate new blocks, in order to prevent miners from intentionally uploading infringing clues and fraudulently obtaining rewards.



5.5 Case mediation function

The proliferation of Internet infringement and piracy is closely related to the low cost of infringement. Offline rights protection is complicated for original creators. DCAex.io will provide original creators with peer-to-peer copyright mediation services. The system will push not only the IP monitoring reports on a regular basis, but piracy clues from "crowdsourcing" monitoring from time to time to the original creators. Only by confirming the need for “rights protection mediation” online, the original creators will gain the information of lawyers available in different areas pushed by the system, so that the rights of original creators can be defended collectively. The entire process requires original creators to neither submit additional information, nor bear any economic costs. The lawyers will complete all the procedures associated with the case offline and the compensation awarded will also be given to the original creators in large proportion. DCAex.io can implement the entire process from application, testification, cross-examination, mediation to execution. After the mediation is done successfully, the parties involved may obtain the Confirmation of Conciliation and the system will automatically transfer the DCA Tokens. At the same time, the result of infringement and record of rights protection will also be written into the blockchain as an important indicator of the ability to realize the values of the work.

5.6 Services of decentralized copyright asset exchange

DCAex.io will become a decentralized global digital copyrights asset trading system. Apart from the need to establish the first trading platform for demonstration applications, DCAex.io will no longer build the separate copyright transaction platform for end users, but modularize all functions and open it to "copyright brokers". The system will allow any user who has passed the background verification to use the modular functions provided by DCAex.io to build their own brokerage platform according to their unique position, and represent the works in bulk uploaded by the original creators in DCAex.io. Each trading platform will realize the certificate recording of blockchain, confirmation and registration of copyrights, automatic copyright registration of transactions, view of works and copyright information and copyright verification, sharing, collection, purchase and settlement of works, author

following, and recommendation of related works. The "broker" only needs to submit the application to DCAex.io according to his/her preferences and industry resources, and a vote will be carried out through the community.

Currently, DCAex.io team has reached agreements with several well-known vertical content platforms, such as brand innovation, illustrations, photography, and online education, to jointly promote the copyright transaction of digital creative contents.

6. Economic Model

6.1 Long-term appreciation scope for IP works

The period of protection of copyright works by the international community is usually 50-70 years, which means that a work has enough time to realize liquidation. The originator publishes the copyright of the work on DCAex.io and uses "DCA" as the point exchange unit to complete the initial pricing. With the increase of the copyright transaction, the copyright value of the work will be expanded.

6.2 Anchoring copyright trading as the value basis

When the underlying technology of DCAex.io is completed, the “DCA Token” will be the primary digital currency of the system. DCAex.io rewarded "DCA Tokens" to originators whose copyright deals ranked 1/10 of the total number of users through a rewarding mechanism. Therefore, the value basis of each DCA Token will establish a corresponding relationship with the average value of the originators' turnover.

In addition, 50% of “reserve for recovery” drawn from the commission on copyright transactions will also be regularly destroyed according to the actual amount of “DCA Tokens” recovered.

6.3 Realize the value circulation of the distribution network

“DCA Token” is a medium of copyright value circulation that reflects the overall digital copyrights economy in DCAex.io system. The DCAex.io team will use part of the money to target in 10 areas of digital creative culture globally, 1,000 originators and 10,000 copyrights of original works in each area. These will be invested in the DCAex.io IP incubation. Meanwhile, each originator will provide certain individual time as trading object and encourage by DCA Tokens.

Each area will be a vertical copyright trading platform with a unique type of work. DCA Tokens will help realize the cross-platform value transfer. All of the copyright assets in each platform allow the securitized split of rights and interests and can be traded on the digital copyright assets exchange built by DCAex.io in exchange for DCA Tokens. DCA Tokens can be used to link all DCAex.io-based industry applications, redeem the right to use the copyrights of works, and purchase the personal time of derivatives and original creators. The first originators will come from photographers, designers and artists.

6.4 Ecological incentive mechanism

6.4.1 Create rewards

DCAex.io hopes to value and reward originators by monitoring the works and derivatives of original masters. According to the turnover of the works, adjust the amount of work that the originators can trade. If the total volume of the works submitted by the originators resides in the first 1/10 of all originators, DCAex.io will allow them to upload the second batch of copyright works, according to the proportion of each day

to give the corresponding "DCA Tokens" award. Upon the inbound and release of new works, the system will remove the works with lower transaction volume.

6.4.2 Collaborative rewards

DCAex.io also encourages originators to freely form autonomous teams to jointly work on more complex and difficult creations. DCAex.io will allocate intra-team benefits and provide smart contracts that you can personalize and agree on. The work co-authored by the team generates the first 1/10 portion of the deal, and DCAex.io will rewards the corresponding "DCA Token" by the trade amount.

6.4.3 Share rewards

DCAex.io encourages the originators to participate in the process of community development and construction, for the opinion leaders and users who actively share community works will be rewarded with "DCA Tokens" based on their own contribution.

6.4.4 Monitoring rewards

DCAex.io encourages users with limited computing power and bandwidth to become a floating node in the monitoring network. DCAex.io will provide a monitoring algorithm to each monitoring node. The monitoring node takes charge for data collection and provides infringement clues for anti-piracy. Since the piracy lawsuit requires a certain period of time, DCAex.io will provide "DCA Token" for each monitoring node in accordance with the bandwidth and online time as a monitoring incentive. In the later period, it will gradually increase the share of compensation for rights protection and reduce the incentive of “DCA currency”.

5. Platform setting rewards

DCAex.io hopes to help copyright brokers with professional capability and industry channels to set up their own copyright trading platform as soon as possible and use DCA Tokens to enter the secondary market. As for the copyright brokers who meet the strategic development of DCAex.io, DCAex.io will give sufficient DCA Tokens as an incentive measure.

6.5 Token distribution plan

Coin name: DCA (Digital Copyright Assets), DCA Token;

Total coins: 1 billion DCA;

Distribution ratio:

Application	Amount of Token	Proportion in Total Amount	Notes
Directional Exchange	300 million	30%	6-month Lockup
Monitoring Mining	100 million	10%	

Ecological Incentives and Community Promotion	200 million	20%	
Foundation	200 million	20%	
Team	200 million	20%	24-month Lockup
In total	**1 billion**	**100%**	

7. Team, advisers and support units

7.1 Core founding team

DCAex.io is headquartered in Singapore. Based on the rapid development of the global digital creative market and the unique potential of the project, DCAex.io core team is built by members from several countries. In 2018, a professional team of 30 people has been formed, and recruit talented people as new blood to join in and employ 3-5 developer commanding high-level blockchain technology to become technical backbone of the project, enhance R & D capability, continuously research and develop new products and upgrade products.

7.2 Advisory Team

In order to keep abreast of the latest market information and industry development status, DCAex.io has hired a number of industry experts as project consultants, project management to provide professional advice.

7.3 Support Units

BLOCKCHAIN INVESTMENT

币本资本 BIBEN CAPITAL

乌托邦联合资本 Utopia Joint Capital

紫金资本 Purple Gold Capital

8.Project Implementation and Path Planning

8.1 Development path

- Oct. 2017 Project launched
- Mar. 2018 Official website put online
- Aug. 2018 Foundation set
- Jul. – Oct. 2018 Listed on 2-3 mainstream exchanges
- Nov. 2018 The first copyright blockchain certification storage services opened

8.2 Strategic goals in the following 3 years

- To gain profit from commercialized applications that are system-built for copyright service.
- Through incubation in the community, foreign strategic investment, business cooperation, etc., at least 10 applications will be landed, 10,000 originators will be settled, and an amount of more than 5 million users will be reached.
- The total market value of the industrial chain will exceed 10 billion.

9. Disclaimer and Risk Warning

This document is used for communication only and does not constitute any opinion regarding the acquisition of "DCA Token". Any such proposals or solicitation will be made under a credible term and with the consent of the applicable securities laws and other relevant laws. The above information and analysis do not constitute investment decisions or specific recommendations. This document does not constitute any investment advice or instigate investment concerning securities. This document is not composed nor should it be construed as providing any sale or purchase or sale of any type of securities nor is it a contract or promise of any kind. The DCAex.io team makes it clear that relevant users have a clear understanding of the risks involved in DCAex.io and that users who once participate in the conversion are aware of and accept the risks of the project and are willing to take personal responsibility for any consequence.

DCAex.io expressly disclaims any liability for any damages caused directly or indirectly by this project including but not limited to:

- Any financial risks may be brought by the project recommended by "DCAex " which Users participate in platform may bring;
- Any mistake or omission caused by user misinterpretation of information;
- Asset loss resulted from user transactions of various types of blockchain and any following consequence;
- Direct or indirect economic losses of the users caused by blockchain market economic fluctuations.

"DCA Token" is a digital token used by value-sharing in the blockchain applications system of DCAex.io and is not an investment. We cannot guarantee that the value of "DCA Token" will certainly be added. Users who do not use the "DCA Token" properly may lose the right to use "DCA Token". "DCA Token" is not a kind of ownership or control right. Holding a "DCA Token" does not imply ownership of the DCAex.io platform, and "DCA Token" does not confer any individual rights to participate, control, or make any decisions about the DCAex.io platform, but users who hold "DCA Tokens" would have the right to vote on the DCAex.io platform.

Given the uncertainty regulatory attitude of blockchain and cryptocurrency in various countries, the risk of setting up this project is objective. As the blockchain industry is still at an early stage of development, it poses a number of uncertainties. In addition, the storage of digital currency is somewhat special, so financial risks may also be caused by human error. In response to the financial risk, all large digital asset stores affiliated with the foundations take multiple signatures and jointly manage cold storage with Foundation autonomous Committee.

10. Conclusion

Copyright has been a hot digital asset worldwide for a long time. Unlike the published

blockchain copyright items, DCAex.io can better conform to copyright application context and meets requirements of originators. DCAex.io pays more attention to the head content and head originators of the emerging digital creative industries, and establishes a business model of "IP-based operations." With the rapid socio-economic development, international trade practices on intellectual property will become more and more stringent. Relying on blockchain technology and business model innovation, we will achieve the global distribution of copyright works, and vigorous development of human culture.

DCAex.io Team