



# **ACTION CHAIN WHITE PAPER**

BLOCKCHAIN IS A KIND OF CHAIN DATA STRUCTURE THAT COMBINES DATA BLOCKS IN A SEQUENTIAL MANNER IN A CHRONOLOGICAL ORDER, AND IT IS A

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## Foreword

With the rapid rise of global finance, digital asset trading is entering people's vision in a unique attitude. So far, blockchain technology has been accepted by the world, and the application in various industries has become more and more widely applied, and its value is increasingly recognized. When the progress of digital assets has blown off the corner of the times, financial investment and monetary attributes also get rid of the traditional definition. It cannot be denied that blockchain technology will be an important trend of irreversible development in the future.

The continuous upgrading of communication network and the continuous improvement of computing power have resulted in a new round of the technology of block chain. In recent years, as more and more power has entered the market, the development of block chain technology has increased significantly, and various applications have sprung up like spring bamboo shoots. More importantly, block-chain technology is accelerating the integration of the physical economy and boosting the transformation and upgrading of the industry. Great health industry, modern agriculture ecology, real estate ecology, tourism industry ecology, hotel management ecology, advertising media ecology. These are not only the familiar terms of our ears, but also the new technology that brings convenience for our production and life.

It is because block chain technology is more and more application and landing in production and life, so that people begin to explore the integration and development of all kinds of application and block chain. Block chains can make the data market more equitable and boost the rapid development of the industry's ecology in emerging markets and create more wealth miracles.

# 1. Block chain \_ Subversion of future technology in the field of global digital ecology

## 1.1 Block chains come along with the times

Block chain (Blockchain) is the most popular technical topic in the new era, which integrates distributed data storage, point-to-point transmission, consensus mechanism, encryption algorithm and other computer technologies. It is considered to be another subversive innovation in the Internet age. Because of its great breakthrough in data storage and information transmission, it is likely to fundamentally change the operation mode of the existing economy and finance, and may even cause a new technological innovation and industrial change on a global scale. Block chain is a kind of chain data structure, which combines data blocks sequentially in chronological order and guarantees them in cryptography. The certificate can not be tampered with and can not be falsified distributed books. The essence of block chain is a distributed accounting system, and encrypted digital assets (such as Bitcoin) are the assets or currencies in digital form carried by this system, that is, encrypted digital assets are just the representation of accounting, and blockchain is a set of distributed, encrypted, trusted accounting system and clearing system.

Block chain is the underlying technology of digital encrypted currency represented by Bitcoin. With the rapid development and popularization of Bitcoin, block chain technology has shown explosive growth, which has attracted the attention of government departments, financial institutions and social media. As a subversive technology, block chain is leading a new round of global technological change and industrial change, and is expected to become the "birthplace" of global technological and model innovation, and promote the great change from "information Internet" to "value Internet". As a result, blockchains are seen as the fourth technological revolution after steam engines, electricity and the Internet.

At present, the block chain technology has become one of the important infrastructure of the "value internet", many countries start to embrace the technology of block chain actively, and gradually open the new track of the international industry competition, try to seize the high point of the new round of industry innovation and strengthen the international competitiveness of the market, This "new track" of block chain strives for a first-mover advantage. According to the IBM block chain development report,9 per cent of the country's governments are planning block chain investments and will enter the substantive phase by 2020. In the block chain system, the participants do not need to know the background information for others and do not need to use any third-party machine A guarantee, or a guarantee.

The information revolution has greatly changed the world of our life, the dominant position of the pure basic structure world is being challenged, and under the background of the great data singularity and the improvement of the large-scale computing capacity, the Internet is facing the transition phase from the "Information is the power" to the "computing power", And the world economic structure is composed of bit information more than the power migration. The new technology of the disruptive block chain will induce the new economy, the new industry, the new industry and the new mode of the society, and will have the unprecedented and even the revolutionary influence on the human production, the life and the thinking way.

## **1.2 Natural advantages of block chain technology**

### **open type**

Based on the block chain system, which uses open source programs, open rules and high participation, except that the private information of the parties to the transaction is encrypted, the data of the block chain is exposed to everyone. Anyone can query the block chain data and develop related applications through the open interface. The information of the whole system is highly transparent.

### **distributed;dispersed**

The distributed feature of blockchain, also known as decentralized, is the most basic feature of blockchain. In the traditional centralized network system, the destruction of a central node can paralyze the whole system, but for the block chain network, due to the use of distributed accounting and storage, there is no centralized hardware or management organization, the rights and obligations of any node are equal, the data blocks in the system are maintained by the nodes with maintenance function in the whole system, and attacking a node can not destroy the whole network.

### **non-tamper**

Once the information of the block chain system is verified and added to the block chain, the data on the chain is backed up in each network node and will not be deleted, which leads to the high cost of attacking the whole network, thus ensuring that the data in the block chain network is difficult to tamper and unique.

### **Hidden security**

Although all the data recording and updating operations in the blockchain system are exposed to the whole network node, the private information of the trader is processed by hash encryption, that is, the data exchange and transaction are carried out anonymously. Encryption is simply the process of converting the original information by an algorithm, and the recipient of the information can decrypt the ciphertext through the secret key to obtain the original text. Block chain uses many mature encryption algorithms to ensure the reliability and security of the system.

## **1.3 value of block chain: machine trust, value delivery, intelligent contract**

What is the value of the resulting blockchain? In fact, this can be concluded from the characteristics of block chain: decentralized, transaction point-to-point, untampered characteristics can achieve machine trust; transaction irreversible, information encryption characteristics can achieve value transmission; in addition, information point-to-point, untampered and so on can also achieve intelligent contracts.

### **Machine trust**

For example, on the block chain, there is no central mechanism of a third party, and the trust is guaranteed by the peer-to-peer and non-tamper-free trading mechanism. Blockchain technology can't be tampered with, change the central credit creation mode, reduce the cost with the mathematical principle and the non-central credit institution, and establish the credit.

### **Value transmission**

Block chain is the first network that can realize the value transfer: on the one hand, the simple value transmission allows the digital assets to freely flow on the block chain; on the other hand, the token is issued to make the financing more convenient, At the same time, the holder can also enjoy the entire ecological service (such as a token being generated based on a block chain application, having a token, representing the owning application service).

### **Smart Contract**

This clause is recorded in a computer language rather than a legal language, meaning that an electronic contract is combined with a block chain technique, and when a preedited condition is triggered, the smart contract performs the corresponding contract terms.

## 2. ACT \_ to build a digital asset platform in the field of all-ecology

### 2.1 ACT Introduction

From the point of view of industry ecology, ACT (Action Chain, action chain is a comprehensive application platform which combines block chain with all kinds of application scenarios and application ecology. it is committed to providing the most valuable digital asset service for each user, and at the same time contributing to the coordinated development of block chain technology and various applications. From the point of view of blockchain industry, ACT is an extensible public chain based on distributed storage and search technology, and it is an industrial alliance in which business enterprises participate in innovative technology and blockchain landing applications. It is also based on block chains and intelligent networks, with participant-related technologies, Data, products and scenarios are supported, served for the C-end users and the B-end basic master chain. The core main chain can effectively support the business model of asset release, transfer and exchange, and the internal smart contract can directly support the online hosting and crowdfunding, and most financial core business can be supported in the core chain. The side chain can customize the specific personalized business scene and bind(anchor)to the main chain to realize various applications. In the future, ACT will build a brand new one based on the exploration and penetration of blockchain technology, deep excavation including encrypted assets, blockchain projects and digital assets. ACT digital asset ecological chain.

### 2.2 ACT ecological platform based on block chain technology

ACT has sufficient scalability and extensibility in the basic applications of the global commercial Internet, and at the same time realizes the real seamless link in the global information exchange. The goal of ACT is to use blockchain technology to construct a

trusted and distributed business ecological public chain that can not only cycle itself, but also expand outward.

In this ecology, the information is relatively transparent and symmetrical, a large part of the source of profit comes from the realization of real value, only a small part comes from information asymmetry (absolute symmetry does not exist);

in this ecology, each business participant can make the trust friction of the cooperation minimal, making the commercial cooperation between the parties more simple, efficient and low-cost, and further enabling the resources to be concentrated in more advanced technology, better products and higher quality service, to produce greater value;

In this ecology, every natural person, each enterprise can find their own place, according to what they are good at contributing their own value, and get a relatively fair reward;

In this ecology, the technology of block chains should have a space in all its aspects, including commercial activities and corresponding economic activities;

In this ecology, value is accompanied by the rapid transmission of commercial activities in an expanding closed loop. The form of value may be goods, services or direct "funds".

## **2.3 ACT's vision and goals**

The emergence of blockchain technology is another subversive technological revolution after big data, cloud computing, Internet of things and artificial intelligence, which has been highly concerned by governments, financial institutions and science and technology enterprises all over the world. Since 2016, developed countries such as the United States, the United Kingdom, Japan and other developed countries have raised blockchain technology to the national strategic level to support the research and

application development of blockchain technology. At the micro level, because of its natural technical characteristics and advantages, large enterprises all over the world actively pay attention to and explore the combination of block chain technology and real economy, try to use blockchain technology to solve industry problems, and promote the industry to renew. Be alive and alive.

ACT is committed to achieving various applications in the chain and forming its own unique ecosystem in various fields. Based on block chain technology, ACT will create a public chain of value that adapts to the landing of ecological applications, and develop its own block chain advertising, APP, digital assets, e-commerce, mobile payment, social networking, data storage, financial insurance, financial transfer services and other omnidirectional and multi-domain ecosystems in value communication. The ultimate goal of ACT is on the basis of traditional digital currency. Will extend a universal public chain suitable for the whole industry application.

## 3. Analysis on the present situation of Industry Ecology

### 3.1 Industry status of block chain

At present, the blockchain industry is in the stage of rapid development, and the number of entrepreneurs and capital flows in, and the number of enterprises increases rapidly. Blockchain application accelerates the implementation, promotes the high-quality development of traditional industries, and accelerates industrial transformation and upgrading. Using blockchain technology to "reduce costs" and "raise efficiency" for the real economy, the development of traditional industries is promoted. In addition, blockchain technology is being derived as a new business form, becoming the new kinetic energy of economic development. Blockchain technology is pushing forward a new round of business model change, becoming an important support for building a good faith social system. At the same time, local governments actively position blockchain technology, policy system and regulatory framework from high level of industry. Step-by-step development and improvement.

At present, one of the most common and successful applications of blockchain technology is digital currency, which is mainly represented by Bitcoin. Based on Bitcoin, a series of competitive coins are derived, such as Swiss coins, dog coins, latte coins and so on. Up to now, thousands of digital currencies have appeared in the world, and there are about 700 existing ones. With the help of frequent transactions, decentralized and other characteristics, the transaction and circulation value of digital currency is relatively high and more stable. After the global blockchain constitutes the information system, it will be more widely used in digital currency.

As with the development of the Internet, blockchain, a subversive technology that requires large-scale collaboration and participation, will rise longer than most people expect, and the ultimate impact will be far more extensive and deep than most people

think. The future development of blockchain may not be smooth sailing, but as the core technology of the next stage of digital wave, it will eventually build a diversified ecological value Internet, thus profoundly changing the structure of the future business society and everyone's life.

## **3.2 existing pain points in blockchain and digital asset industry**

### **1) Digital assets are not easy to manage**

With the rapid development of digital asset industry, the management threshold of different asset allocation or diversification is too high. It is difficult to use decentralized wallet and there are hidden dangers in the central organization. How to better take into account the safety and convenience is a long-standing problem in the industry.

### **2) The transaction and the conversion difficulty are large.**

At present, the trade and exchange of the digital currency in the market are mostly done through the exchange, the operation difficulty naturally forms the user threshold, the transaction also has a certain limit, and also the risk that the platform has the possibility of default.

### **3) High cost of blockchain development.**

Blockchain technology is increasingly recognized by the public, but the high development costs have also deterred many enterprises. For example, the mining model of POW has been competitive for a long time, the price of mining machine is high, and the cost of electricity is high, which makes it difficult for blockchain technology to serve the general public.

#### **4) lack of practical landing application**

For the blockchain industry to have a longer-term development, there must be a wider range of application scenarios to the ground. At present, some product schemes and enabling real economy have been gradually developed in the field of blockchain, but the application of real landing and standardized implementation is scarce.

### **3.3 Ecological Application and Landing Market Analysis of ACT**

#### **1) large and healthy market size and consumer demand**

The low cost and high efficiency medical health system will have a profound impact on the global medical industry pattern; the opportunities and challenges of economic globalization coexist; the aging of the population, the sub-health state and the change of climate and environment have created a broad space for the development of large health industries; at the same time, the development of science and technology will also provide inexhaustible impetus for the development of large health industries.

As one of the world's largest industries, global health spending is about one-tenth of the total GWP, a new engine for global economic development. In 2011, the global health sector was \$6.97 trillion. The highest proportion of health and health expenditure in high-income countries is the lowest in low-and middle-income countries, and low-and middle-income countries need to strengthen their investment in the health sector. The global output value of the health industry in 2020 will reach US \$13.93 billion, or about 1.9 times in 2011. Global per capita health expenditure will continue to grow, to \$188,2.188 per capita by 2020. whether or not the market rules

## **2) Status quo of food traceability in global agriculture.**

In the face of hidden dangers of food safety, it is recognized that it is one of the more effective management means to establish the whole quality supervision system of food safety, and to use tracking and traceability means to meet the requirements of consumers and government regulators for food safety. Many countries in the world are gradually establishing animal product marking system and traceability system, some of which have been enforced by legislation. For example, the traceability system of the United States has brought great economic benefits and improved the core competitiveness for the export trade of animal products. The European Union requires that food exported to the country must be able to track and trace, or it will be banned from being sold on the market. Japan establishes pork, aquatic products and A traceability system for spinach. Australia has established a traceability system for livestock products. Sweden, France, Britain, Germany, Belgium and other European countries, as well as Canada, Argentina and other American countries have established traceability production systems.

## **3) Current status of real estate online transaction.**

As a special asset with multiple values, such as residence, investment and education, the real estate has stable purchase and transaction demand in the world. However, traditional transactions that rely on local and offline mode have caused a series of problems, such as large geographical restrictions, difficult acquisition of purchase qualification, limited currency exchange, poor liquidity, long transaction period and high threshold, which makes it difficult to realize internet.

## **4) lack of advertising media market**

At present, for the traditional advertising media model, there are a variety of media operators platform in the market. The channel layout of the city, location, coverage of

the crowd are different, when media customers have targeted advertising media needs, can not better integrate media operators channel resources, to achieve a more efficient delivery effect.

## 4. Multi-domain Ecological Application of ACT combined with Block chain

The field of vision of ACT never stands still. Looking at the future, grasping the future is the direction of ACT's efforts. ACT will effectively implement application construction in many ecological fields, such as agricultural ecology, large health ecology, real estate development ecology, tourism industry ecology, hotel management ecology, advertising media ecology, ecological construction composition of commercial value system, the ecological environment of global historical culture, global commercial super ecological, etc

### 4.1. Large healthy ecological application of ACT

The large health industry is a general term for providing preventive, diagnosis, treatment, rehabilitation and palliative medical goods and services in the economic system. However, there are many problems in the current global health products and service market, such as the secondary charging, the high price and the non-transparency of the product, which are difficult to solve in the traditional technology and market system.

In response to these problems, ACT will be based on offline entity support, take advantage of the de-centering feature of block chain to effectively land in the construction of large-health industry, provide safe and convenient payment channels for all parties in the field, and provide sufficient consumption protection for consumers. Provide more profit-to-profit models for investors and suppliers. The ACT hopes to further optimize the security, reliability and other advantages of block chain, and solve all kinds of problems in the related industries. The industry-related subjects can carry on the activities such as information transmission, data mining, asset trading and fund distribution on the ACT, which are protected and encouraged by the block chain technology.

## **4.2 ACT Modern Agriculture Traceability Ecological Application.**

Nowadays, agricultural production will apply more Internet technologies such as intelligent interconnection, Internet of things, big data, e-commerce and so on, effectively get rid of the factors of natural disasters, do not bind to the constraints of soil planting, and make agricultural operations more ecological, intelligent, urbanized and liberalized. Human beings can get healthy, clean and sustainable food and good things from nature with lower cost, better resource structure, better circulation link.

With agricultural products as the link, ACT will use block chain, Internet of things, Internet of things and other information technology as a means to integrate agricultural production, trading, circulation, finance and other industrial elements to implement "order-based" sales to achieve "on-demand customization model". In short, ACT's new agricultural 3.0 model is to make products directly linked to demand from the beginning of production, and to truly realize the traceability of agricultural products. It is a more advanced agricultural economic organization model in which agricultural real economy and virtual economy blend each other, which can be said to be the overall, systematic and subversive reconstruction of the traditional agricultural industrial chain.

## **4.3 ACT Ecological Application of Real Estate Development**

The real estate development industry has always been the most profitable industry in the world, but it has been difficult to realize the Internet: at the real estate end, the traditional Internet technology is unable to realize the line-up and the transaction of the real property, and the nature can not cross the region transaction; at the end of the transaction, The real estate trader needs to solve a series of problems such as currency exchange and transaction qualification, which further increases the difficulty of the real

estate on the line. The above two problems have caused the real estate industry to be hard to get rid of the local, offline business model, information transparency, global trade, high-speed circulation and other Internet dividends are difficult to cash out. With the advent of block chain technology, the above question The question is the possibility of a solution. ACT will be realized by means of the digital currency payment in the ecological system, the non-tamper-proof property information chain, the centralized trading mechanism, the automatic disposal of the physical assets brought by the intelligent contract and the like.

#### **4.4 ACT advertising media ecology**

ACT introduces the ecology of commercial advertising to the ground, introduces the principle of attention economy, and quantifies the attention value of users through block chain technology, so that the attention value can be circulated and realized. Through the incentive mechanism of token reward for users' attention, the subjective initiative and enthusiasm of users are better stimulated, and the characteristics of block chain decentralization and data openness and transparency are used to solve the problem of value trust and form a reliable data flow closed loop.

The ecological application of ACT commercial advertising creates a new business environment and commercial relationship, changes the concept of the market and completely subverts the value distribution of the traditional advertising media industry, and shapes the new mode of advertising media.

#### **4.5 ACT Cultural Reading and the Application of Cultural traceability**

On the premise of tracing back to the source of cultural preservation, block chain technology provides the possibility for cultural dissemination and the transformation of intangible culture into digital assets. Under the technical background of blockchain, in

the process of holding and circulating digital assets, ACT will use the way of "reading is mining" to link books of Chinese traditional culture, and store a large number of books digitally, and score books reasonably and extensively through user evaluation. Let the user's choice of reading become more intuitive and convenient. At the same time, ACT will promote the enthusiasm of reading users and commentators through the combination of incentive mechanism and digital assets, so that the culture can be passed on. The broadcast mode and promotion back to most people's hands. Reading is the most direct and effective way to experience and trace culture. ACT's application in cultural reading will greatly promote the spread of Chinese traditional culture, let more people experience the real pleasure of reading, and at the same time, obtain corresponding objective benefits and interests, promote the popularization of cultural reading, so as to realize the real and practical application of the blockchain to Chinese traditional culture tracing and communication.

## **5. Core strengths of the ACT public chain**

### **5.1 weak centralization**

The core design idea of traditional blockchain technology is decentralization. The characteristic of decentralization reduces the trust cost of value interaction, but the power of "decentralized" organization is more decentralized, and anonymity increases the cost of supervision in the actual landing scheme of blockchain. Therefore, weak centralization is replacing complete decentralization in some scenarios. This is a breakthrough in the original public chain model.

### **5.2 No modification of the original chain system is required, and the access threshold is low**

In the cross-chain trading scheme, our account locking mechanism does not adopt the two-way anchoring method, and does not need to add the script extension to the original chain to identify and verify the SPV certification. All the transaction data are restructured and synthesized on the ACT verification node and passed into the original chain node network, all of which are legal formats that meet the requirements of their transaction types, which completely ascribes the specific operation and calculation of cross-chain transactions to the ACT network. There is no need to make any changes to the mechanisms of the original chain, so that the alliance chain can freely access ACT, with low threshold, whether it already has a public chain or a private chain based on other platforms. Reduce the cost of cross-chain transaction cooperation and realize the free flow of assets between chains.

### **5.3 Security assurance based on cryptographic algorithm**

The mechanisms used by many of the existing cross-chain exchanges are often based on logic security and need to be driven by cross-chain transaction participants based on their own interests, i.e., the participants will not destroy the cross-chain transactions at the expense of the detriment of their own interests, which introduces the participant's rational assumptions. In that ACT, in addition to the original elliptic curve password system to ensure the security of the original signature scheme, a plurality of protocols and algorithms are used to protect the system security, the strong consensus mechanism and the anonymous declaration protect the transaction privacy, All subsequent operations do not need to be matched by the transaction participants and will be in A The automatic completion of the CT verification nodes makes the smooth operation of the whole system rely on the security of the cryptographic algorithm, and improves the security of the algorithm on the basis of the logic security.

## **5.4 Privacy protection for cross-chain collaboration**

In the cross-chain cooperation scheme of ACT, the assets on the original chain exist in the form of tokens in the intelligent contract on the ACT. On the one hand, we hide the sponsors of the intelligent contract token transaction in a collection of accounts through the relevant protocols, so that the sponsors are untraceable to anyone, on the other hand, through the intelligent contract, the original chain can not establish a corresponding relationship with the original account on the ACT common chain. Isolate the contract account from the original account. By combining the two aspects, the privacy of intelligent contract token transaction is realized, that is, the transaction after asset cross-chain is protected by privacy, which provides users with the same experience. And the application scene is expanded.

## **5.5 unprecedented high performance**

### **1) Rapid transaction verification**

By optimizing the key links such as signature algorithm, account book structure, data operation, serialization, consensus mechanism, message diffusion and so on, the ACT common chain can realize the fast transaction verification at the second level. Meet the user experience of most blockchain application scenarios.

## **2) Mass data storage**

In the mode of block chain double accounting, the historical data accumulate continuously under the long run of the system. ACT draws lessons from the mechanism of separate storage and table storage of cold and hot data in the traditional financial system to realize the effective storage of massive data. Old transaction data, passive asset data and other information can be stored using big data storage platform (such as Hadoop, PB level data storage).

## **3) High throughput**

The essence of block chain is a distributed shared accounting technology, and its distributed characteristics are mainly reflected in distributed consistency rather than distributed concurrent processing. In order to ensure the consistency of the data and prevent the Byzantine problem, some specific links can only be executed serially, not in parallel. Through long-term testing and optimization practice, the processing performance of ACT has been able to meet the requirements of ten-level TPS. If Off-Chain and other mechanisms are introduced, the transaction throughput can be further greatly improved.

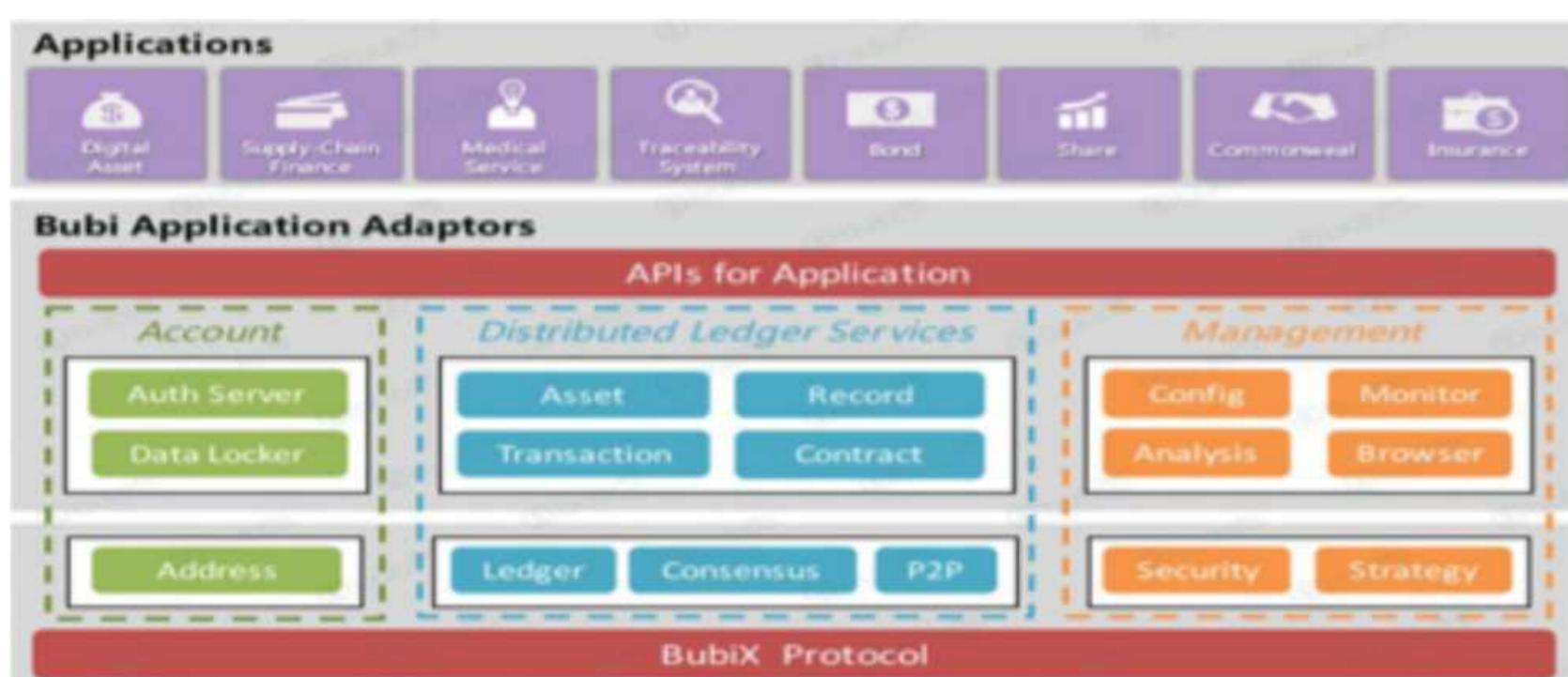
## **4) Fast synchronization of node data**

The ACT public chain support mirror (Snapshot) mechanism can mirror the local ledger and implement the convenient rollback mechanism. Under the unified consensus, the mirror label can be specified for rollback; at the same time, the period of adding the new

node to the operation is shortened, and only the latest image and a small number of recent transaction sets need to be synchronized, so that the network can be integrated into the network and participate in the consensus verification.

## 6. ACT implementation and product architecture

In order to solve the various obstacles that the block chain technology may face in the application of the landing process, the ACT block chain platform adopts a two-layer structure: (1) the bottom layer ACT chain end provides a block chain basic service; (2) the upper layer ACT Application Adapters are packaged internally and externally subjected to modeling and adaptation, A series of interfaces that meet the application scene is provided to reduce the complexity of the application docking, as shown in the following figure.



ACT product architecture is divided into three components: account center, distributed accounting service, strategy and management. Most of them are implemented from scratch, some of them use some standard open source components, and others are optimized and improved on a mature framework.

Account center: public and private key generation, public key writing, private key signature and management; application layer user information mapping to block chain address; regulatory requirements to support real name authentication and audit.

The distributed ledger service is based on the underlying networking of the P2P protocol, and the nodes are distributed through the P2P protocol; the definition of the account structure and the storage of the account book data are provided; the pluggable consensus module is responsible for ensuring the strong consistency of the underlying data while resisting the attack from the "malice" node. The modeling and adaptation of the application, including the modeling and implementation of various objects, such as assets, records, transactions, contracts, etc.

Policy and management: provide complete data privacy security and access policy control solutions. A variety of visual management tools, bottom block chain health monitoring, system parameter configuration, data analysis, block chain browser and so on.

## 6.1 Account Centre

Unmanaged interface: suitable for enterprises with the ability to generate and use private keys at a high level of security on the application side. For example, in the field of finance, the generation and management of private keys are combined with the existing secure client systems such as U shield, electronic signature and so on.

Managed interface: suitable for application scenarios with high degree of interconnection. The use of public and private keys directly as user names and passwords is poor for ordinary users. Most users are used to using mobile phone numbers, mailboxes, nicknames and so on as user names. Therefore, in the managed interface, through the secure private key generation and management system, the application layer user information is mapped to the block chain address, so that the upper application and the underlying blockchain platform can not touch the user's private key. The managed interface uses the account center architecture and consists of authentication service, private key safe and block chain account tree.



### Authentication service

The authentication service mainly solves the security problem of the third-party application and the account center. By adding the random number and the blind signature technology in the interactive process, the security of the key is enhanced, the possibility of violent cracking is reduced, and the access security of the client is enhanced by using the white box encryption technology.

### Private key safe

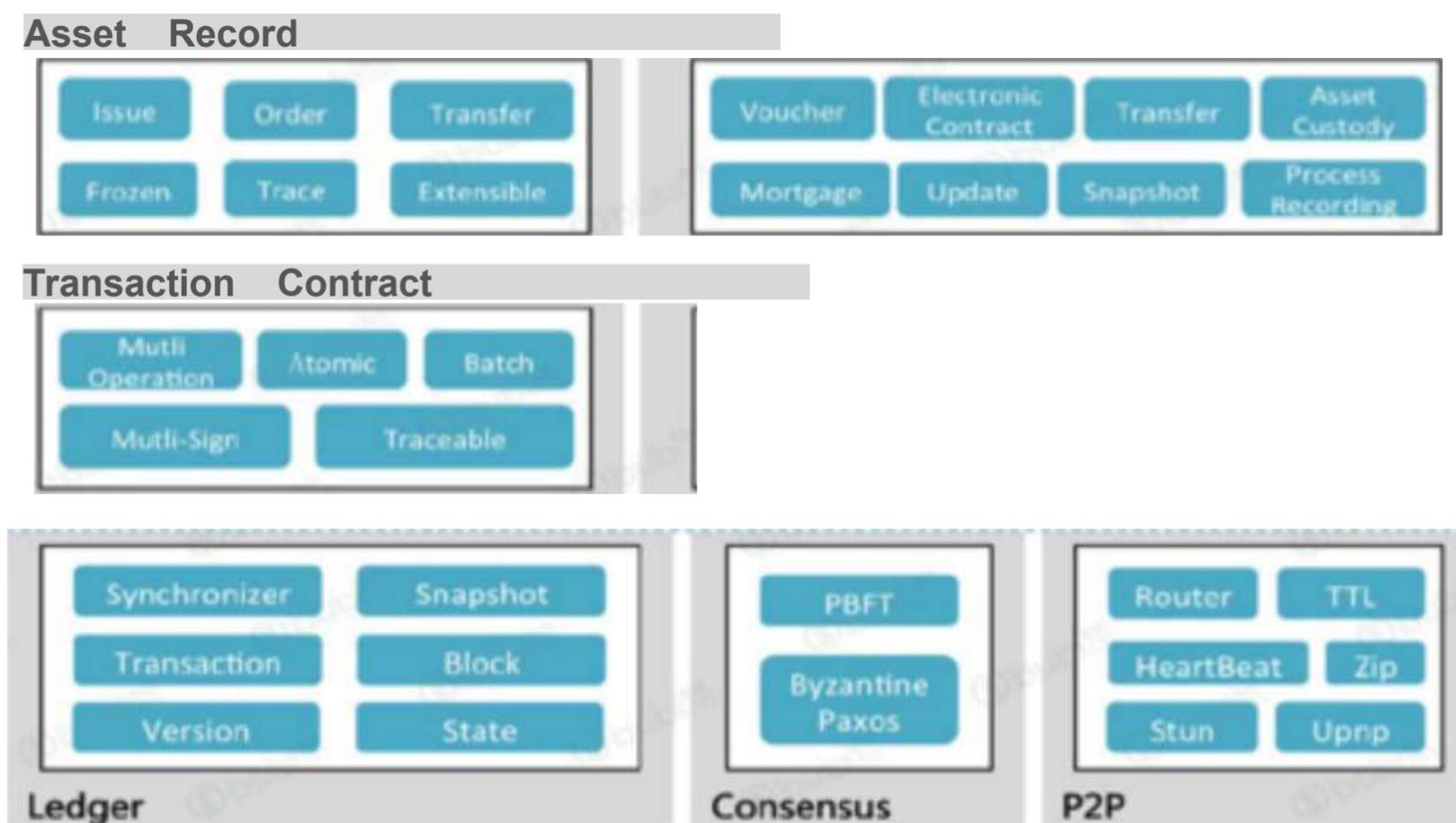
The writing and reading of private keys are transmitted and stored in ciphertext in the safe system. The user corresponds to the key one by one. The key is generated on the client side and the client does not need to save it. Every time the private key is needed to sign, the client can get the encrypted private key and decrypted key through the blind signature process.

### Block chain account tree

The ACT block chain stores a complete account tree, each leaf node records the asset information and identity information of an account (optional); each account can support the use of multidimensional assets. Support a variety of encryption and decryption algorithms, according to different scenarios to choose to use.

## 6.2 Distributed Ledger Services

The base service of the ACT block chain is composed of the P2P network, the distributed ledger and the consensus service. At the same time, to facilitate the application layer understanding and docking, the application component is abstracted in the distributed ledger service adaptation layer. (as shown in the figure below)



### Underlying architecture

P2P networking: peer-to-peer protocol (Peer-to-Peer) realizes basic networking and communication, maintains a list of neighbors per node, realizes dynamic self-organizing

network, and can be used in conjunction with existing security protection facilities to ensure the security of commercial networks.

Distributed ledger: solve the problem of data format, data recording, data storage, generally speaking, "what account and how to keep an account". Therefore, the design of distributed ledger determines the ability of the bottom of the block chain to provide services to the outside world.

Consensus service: it is the core of block chain and the biggest difference between block chain and traditional distributed system. It ensures the strong consistency of the underlying data and can resist the influence of "malicious" bad guys. ACT consensus service provides a set of abstract consensus interfaces for connecting consensus algorithms and other ACT Chain modules. It is responsible for accepting and processing Transaction, and giving consensus results. Consensus service adopts an open framework that can support different kinds of consensus algorithms. At present, ACT has developed Byzantine Paxos, Byzantine R. Aft commercial consensus algorithm, which supports PBFT and other consensus algorithms, can select different algorithms according to the performance, security, fault tolerance and other requirements of the upper application.

### **The application component**

In order to facilitate the understanding and docking of the application layer, various components such as assets, records, transactions, contracts and the like are abstracted in the distributed ledger adaptation layer.

Assets: support the assets that are currently digitized and the assets that can be digitized by asset securitization and assets in the future.

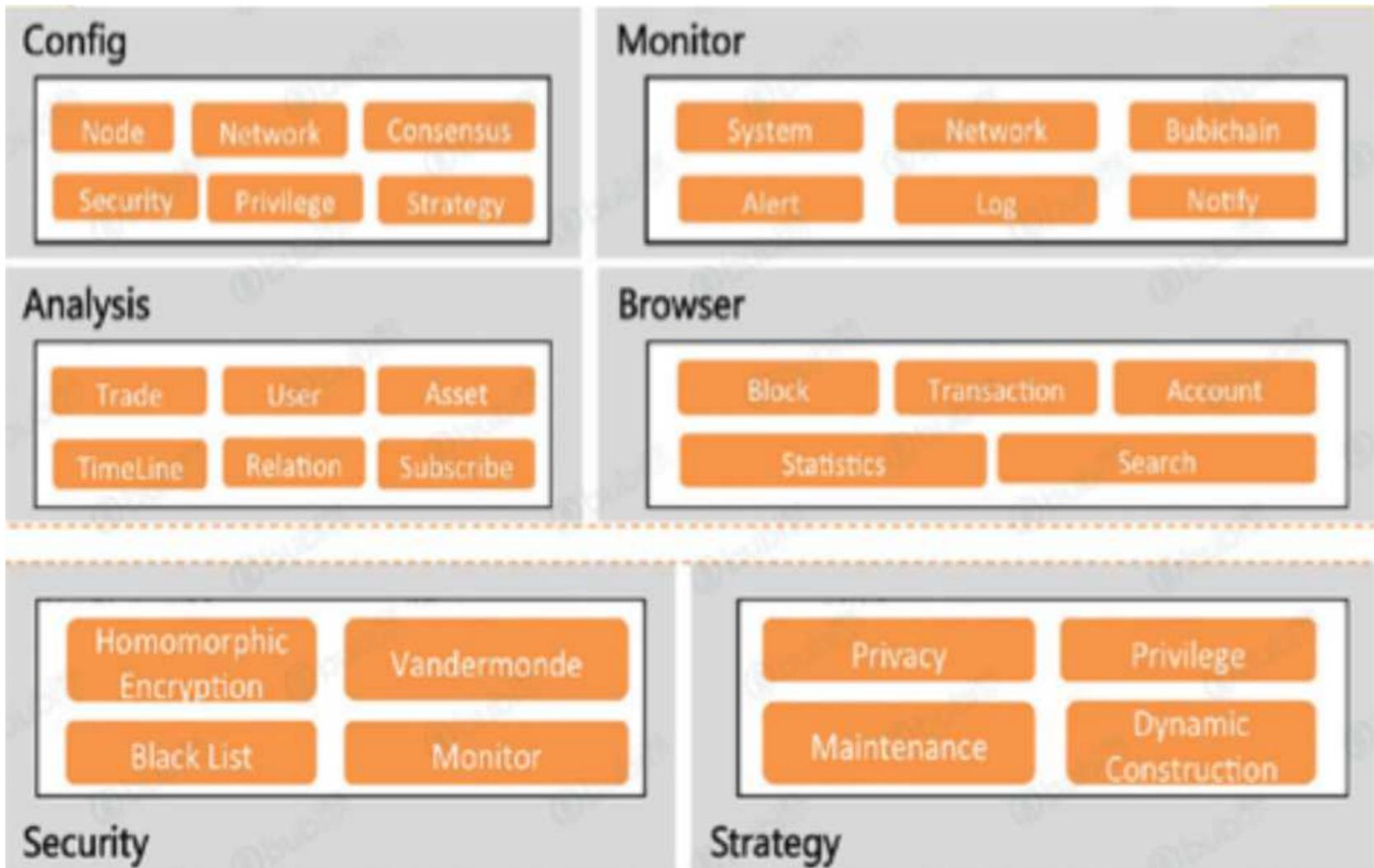
Record: it is necessary to use blockchain to increase the authenticity and trust of information records, such as vouchers in the financial field, traceability information of supply chain, etc.

Transaction: an atomic-level operation that interacts with the bottom of a blockchain. An upper application can correspond to a transaction or be completed by a set of transactions.

Contract: provide two kinds of contracts-standardized contracts, programmable contracts. Standardization contract, it is mainly aimed at the relatively simple scenario, high degree of standardization, at the same time, the implementation efficiency has a high requirement of business requirements. For example, asset exchange transaction consistency protection, asset transaction listing and brokering, and so on. Standardized contracts can be directly linked to the chain through configuration generation without programming or virtual execution to reduce the cost of upper application and improve the efficiency of contract execution. To cope with the complex business logic of users, ACT also supports user self-programming and provides a wealth of components for users to respond quickly to specific needs Build applications, such as encryption components, privilege management components, and so on. At the same time, ACT provides the corresponding template for general scenarios such as assets and storage. Users do not need to write code from scratch, only need to change the key parameters of the template, plus the characteristics of their own business to establish mature contract applications.

### **6.3 Strategy and Management**

The security and policy mechanism provided by ACT block chain platform can not only manage and maintain the configuration and security of block chain system itself, but also manage the access policy and privacy security of block chain storage data.



As shown above, the bottom of the blockchain provides two basic functions: secure (Security) and policy (Strategy). The adaptation layer provides a series of visual management tools, including configuration management (Config), health monitoring (Monitor), data analysis (Analysis), blockchain browser (Browser).

## Security

The underlying security service is responsible for solving system networking, interface access, consensus algorithm, data privacy and other security issues. At present, most industry applications are alliance chain and private chain.

**System networking security:** networking can be strengthened with some traditional security measures, such as access to IP control, special lines, node authorization access, node trust list and so on.

Interface access security: The CA mechanism can be introduced at the interface layer, and only the authorized mechanism can access the interface of the block chain platform.

Consensus algorithm security: different consensus algorithms have a security margin.

Taking PBFT as an example, the security problem of  $N^3$  is determined by configuration, and the security and fault tolerance are at the maximum value of  $2^3$

threshold. In order to achieve the security of the consensus algorithm, the voting threshold can be set at 90% or higher at the expense of some fault tolerance. At the same time, malicious node discovery and processing, black and white name single system and so on can be added to strengthen the security of consensus algorithm.

Data privacy security: block chain as a data warehousing solution, it can provide privacy protection is not very different from the traditional database: symmetric encryption and asymmetric encryption, common technologies are homomorphic encryption and RSA; privacy protection and block chain data sharing trust balance is determined by the business scenario.

### **Policy (Strategy)**

Policy services not only provide the above security policies, but also include node deployment policy, data access authority policy, multi-signature (Multi-sign) joint control policy, compliance policy, performance policy and so on.

### **Configuration management**

Configuration management service mainly provides visual configuration operation, aiming at the above security, policy, authority, block chain node, distributed account structure, consensus algorithm, system parameters and so on. Configuration itself can

also be used as a block chain transaction, which can be determined by the joint voting of the nodes.

### **Health monitoring (Monitor)**

ACT block chain health monitoring platform provides three dimensions of monitoring: physical layer (CPU, memory, disk, etc.), network layer (delay, broken line) and business layer (block generation, transaction verification), and provides a perfect alarm, log, message notification mechanism system, which is convenient for the operation and maintenance of commercial systems.

### **Data analysis (Analysis)**

The majority of the storage in the distributed ledger is the original data, and there is a small number of standardized association relationships. In order to meet the complex data analysis requirements of the upper layer, the data analysis service supports both the standard data query interface and the two customized interface services for batch export and subscription.

### **Block Chain Browser (Browser)**

In the absence of privacy, the block chain browser can see the data information stored at the bottom of the entire block chain in real time, including block information (Block), account information (Account), transaction information (Transaction), contract information, and the like.

## 7. Issuance Programme

### 7.1 Quantity planning

The ACT Coin has a global constant of 600 million.

### 7.2 Distribution programmes

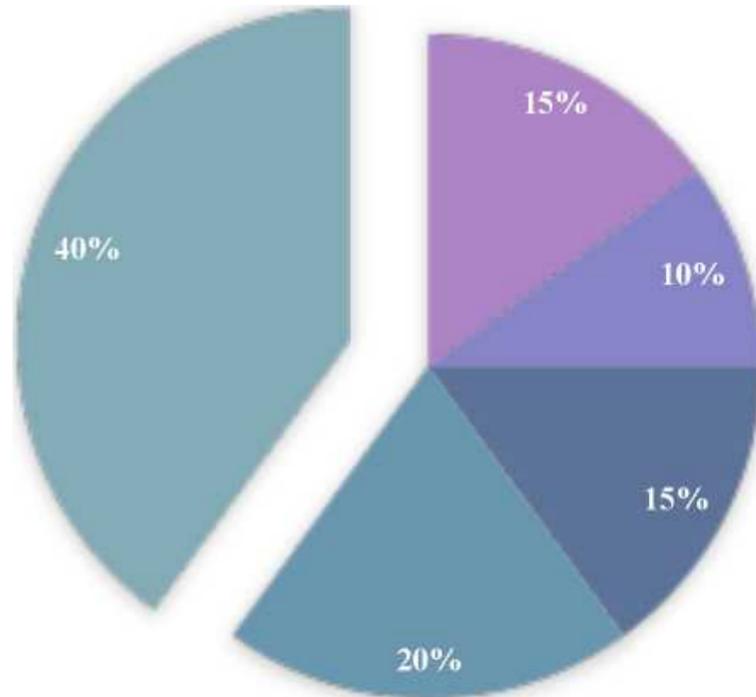
Technical operation team: 15%, 90 million, and lock bin or two years

Founding team: 10%, 60 million, and lock bin for 3 years Fund

team: 15%, 90 million, lock bin for one year to two years Consensus

mechanism: 20 per cent, 120 million (halved every two years)

## ACT Coin Release Scheme



■ Technical operation team ■ Founding team ■ Fund team ■ Consensus mechanism ■ Community Promotion Award

Community Promotion Award:40%,240 million

## 8. Development planning

Layout of the global market, ACT project launched

- Elite team set up

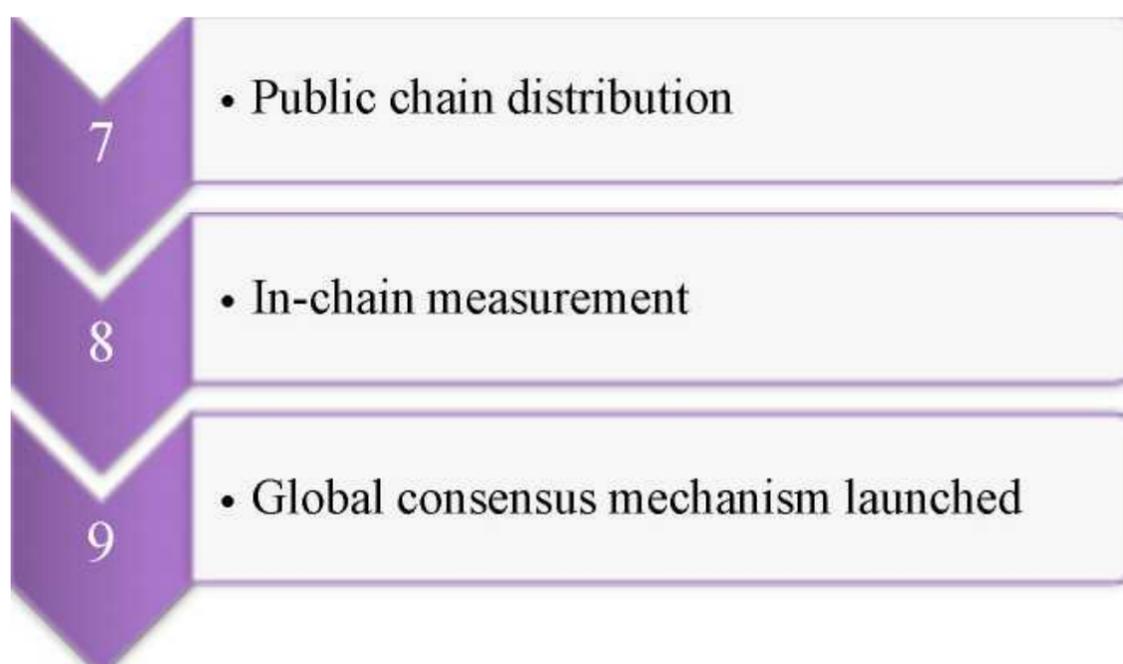
Project token online

Project roadshow starts

Automatic community establishment, community promotion start

The market resources, the ecology and the application of the whole market are on the ground.





## Appendix Risk Tips

There are various risks in the development, maintenance and operation of ACT, many of which are beyond the control of ACT developers. In addition to the other elements described in this white paper, participants are invited to be fully aware of and agree to accept the following risks:

### Market risk

The price of ACT Coin is closely related to the whole digital money market situation. If the overall market situation is low or there are other uncontrollable factors, it may cause the ACT Coin itself to have a good prospect, but the price is still undervalued for a long time.

## **Regulatory risk**

As the development of the blockchain is still in the early stage, there are no relevant regulatory documents concerning the pre-end requirements, transaction requirements, information disclosure requirements and locking requirements in the process of raising in the world. It is also unclear how policies will be implemented, and these factors may have an uncertain impact on the development and liquidity of the item 目. Blockchain technology has become the main object of supervision in various major countries in the world. If the regulatory subject is involved or affected, the ACT may be affected by it, for example, the use of the law is restricted, and the ACT may be restricted, and the application and development of ACT can be blocked or even terminated directly.

## **Venture of competition**

At present, there are many projects in the field of block chain, the competition is very fierce, there is strong market competition and project operation pressure. Whether ACT project can break through many excellent projects, has been widely recognized, not only linked to its own team ability, strategic planning and other aspects, but also affected by many competitors in the market, there is a possibility of facing vicious competition.

## **The risk of brain drain**

ACT brings together a team of talents with both vitality and strength, attracting senior practitioners of block chain and experienced technical developers. In the future development, it is not ruled out that there are core personnel leaving and conflicts within the team that lead to the negative impact of ACT as a whole. The accelerated development of project technology risk cryptography or the development of science and

technology, such as the development of quantum computer, or bring the risk of cracking to ACT platform, which may lead to the loss of ACT data. In the process of project update, there may be vulnerabilities, which will be repaired in time after discovery, but there is no guarantee that there will be no impact. Not yet. The other risks identified in addition to the risks mentioned in this white paper are, in addition, a risk that some of the founding teams have not mentioned or are not yet anticipated. In addition, other risks may occur either suddenly or in a combination of a variety of already mentioned risks. Participants are invited to fully understand the team background before making a decision to participate in decision-making, to know the overall framework and thinking of the project, and to participate in the rational participation.