

# The Data Validation --- Blockchain



**KorthoChain**

Whitepaper

**Mar 2021**

# Executive Summary

Since the human society entered the 21st century, information technology has developed rapidly, driven by computers and the Internet. People have stepped into the era of the Internet, so that human beings can share and connect information in all corners of the world, working together as one big family. However, with increasing dependencies on the Internet and the convenience brought by technology to human beings, data security problems have become increasingly serious. Nowadays, permission access for information are chaotic, data information leakage is rampant, smart terminals are compromised, and other problems follow one after another. When faced with various information plagiarism and terminal data analysis, people will have no privacy and are exposed. Important issues on how to optimize the online data, security and ownership will have to be reexamined.

To this end, the KorthoChain blockchain ecosystem has emerged at the right time, providing a brand new blockchain solution for data encryption and desensitization, transaction information storage and data confirmation in the Internet field.

The KorthoChain is affiliated to the Kortho Foundation in Singapore. It is the pioneer of the public chain in the field of data right confirmation. KorthoChain has a complete blockchain architecture, including P2P network architecture, DSL specific smart contracts, PPOS consensus algorithm mechanism, ED25519 signature algorithm, SHA-3 encryption security algorithm, and Badger persistent k-v storage database.

KorthoChain is based on the POW+POS consensus algorithm, which has high fault tolerance, solves the problem of inconsistent block information in the network, and also greatly improves efficiency. It is expected that TPS

can reach more than 100,000 transactions per second. While protecting the interests of all participants, and effectively integrating resources in various industries, KTO Pass will build a new value Internet ecology with multiple participation and multiple benefits, and provide new business directions and underlying technical architecture support for the field of data right confirmation.

KorthoChain will create a new type of shared data ecology that is equal, mutual trust, inclusive and efficient. Protecting the rights and interests of ecological participants through smart contracts; realizing the transmission and protection of information value through DSL contracts, PPOS consensus and other technologies, attracting multiple parties to participate in the ecology; reducing storage and bandwidth costs, and ensuring information security and inquiries; facilitating sharing through the development of a series of DAPPs The retail ecosystem is developing rapidly.

KorthoChain uses the decentralization of the blockchain, distributed access to the database and the token economy to promote the ecologicalization of data confirmation. This includes data information traceability, data on-chain, equity token incentives, etc. Data verification can be applied to various fields of the Internet and even the physical industry. For example, in the field of e-commerce, it can effectively ensure the quality and safety of goods. From manufacturers to merchants to consumers, the production and circulation data of every product is uploaded onto the blockchain. While ensuring the quality of the goods purchased by consumers, the transaction timestamp is put on the chain to ensure the rights and interests of consumers, promoting the quality assurance of consumer goods and the integrity of merchants, and thereby increase the production capacity of the consumer ecology. Participants in the ecosystem measure the incentives of their equity tokens through their contribution value. The higher the contribution value, the more equity token rewards they will receive.

This white paper has designed a public chain platform that meets the ecological needs of KorthoChain, and is connected to public chains such as Ethereum and Polkadot through cross-chain protocols to realize the transfer of cross-chain asset value. In the ecology, scenarios such as shared data application scenarios, token incentive systems, people's livelihood application scenarios, secondary token issuance scenarios, and traceability cloud services have been realized. Building a full ecological consensus incentive system through blockchain technology, allowing all participants, including consumers, collaborators, investors, and other parties, to jointly create and maintain the economic ecology of the KorthoChain token.

# Terminology

## “ KTO

KTO is the decentralized Token of the KorthoChain public chain platform

## Smart contracts

Smart contracts are event-driven, stateful, recognized by multiple parties, programs that run on the blockchain and can automatically process assets according to preset conditions. The biggest advantage of smart contracts is that they use program algorithms instead of relying on people for the arbitration and execution of the contract.”



# CATALOGUE

## **Executive Summary**

## **Terminology**

## **01 Vision and Mission**

### 1.1 Vision

To empower new business ecosystem through data confirmation

### 1.2 Mission

### 2.1 Market Analysis

### 2.2 Identify Market Problems

## **03 Ecosystem**

## **04 Ecosystem Application**

### 4.1 Decentralized Financial Services (DeFi)

### 4.2 KorthoChain Token Incentive

### 4.3 Data Traceability and Validation

## **05 Technical model and development blueprint**

### 5.1 Technology Architecture

### 5.2 Core Technology

### 5.3 Development blueprint

## **06 KTO Introduction**

### 6.1 KTO Introduction

### 6.2 KTO Advantage

### 6.3 KTO Circulation

## **07 Issuance and Distribution**

### 7.1 Foundation Governance

### 7.2 KTO Distribution Plan (2 stages)

## **08 Team introduction**

### 8.1 Core Team

## **Disclaimer**

### 9.1 Legal Notices

### 9.2 Risk statement

# 01

## Vision and Mission

### 1.1 VISION

Bulid a global personal data security underlying system

### 1.2 Mission

Make human data more valuable !

# Background Analysis

## 2.1 Market Analysis

Today, data is called the "oil of the 21st century." The Chinese government has listed data as the five major production factors alongside capital, land, labor, and technology. In the future, data will play an increasingly important role in human society.

### • Analysis of Global and China data application status

A report called "Data Age 2025" in IDG shows that the annual global data will increase from 33ZB in 2018 to 175ZB in 2025 (1ZB is equivalent to 1.1 trillion GB).

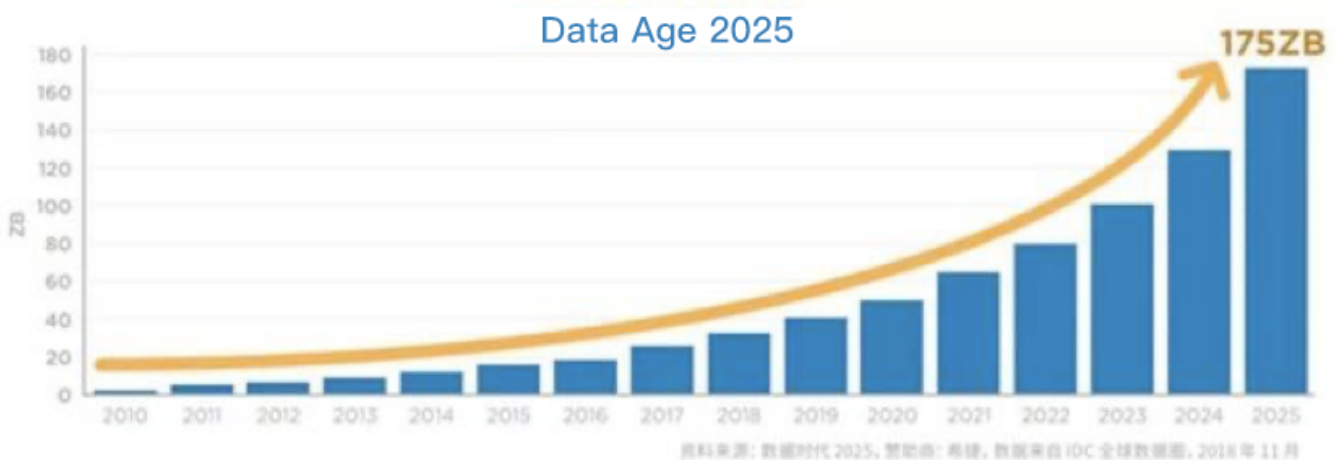


Figure 2-1 Annual scale of the global data circle Source: IDG

We can see that the scale of data generated every year has increased exponentially. With the advent of the digital economy era, everything such as the Internet of Things and the smart economy is inseparable from the support of the underlying big data. The future data scale will ever increasing.

However, the problem with data applications at this stage is that, in Internet applications, data is controlled and monopolized by a centralized platform, and data cannot be confirmed. The producers and providers of data are individual users, but the final ownership and use rights of data are taken away by third-party companies. The resulting

data privacy leakage, data is-lands, data value deprivation and other issues have increasingly become stubborn diseases in the digital age.

In response to the increasingly serious data problem, Professor Zhao Yanqing of Xiamen University analyzed in the article "Platform Economy and Socialism: The Essence of the Ant Group Incident" that the reason why platform-based companies such as Ant Group and Tencent Group have such a high market value, it is because they are taking big data, a public resource, as their own, and because the market has calculated the value of big data created by China's huge user base into the assets of these companies.

The creation of property rights is essentially a process of cost-benefit weighing. Property rights will only be produced when the benefits of internalizing externalities are greater than the cost of engaging in this behavior by defining property rights. When the benefits of determining the data property rights are greater than the cost of determining the data property rights, the data has the basis for determining the rights.

It can be seen that the economic basis for the confirmation of data property rights has long been created.

#### • **Development status of global data validation**

At present, the laws of various countries around the world do not have a clear legal explanation for the ownership of data property rights. The ownership of big data is still in the hands of technology-based platform companies. Once the data is refined, it means that all future data will be generated with clear data subject, data revenue, remuneration pricing, distribution model and circulation configuration.

If the future period is likened to the "Era of Big Data Navigation," where massive amounts of valuable data bring the advancement of world technology, then the period now and before would be a period of data dividend development. Generally speaking, big data is generated by individuals and users on the Internet. However, in the Internet era, the property rights or ownership of the data are, by default, large Internet platform companies, such as Amazon, Google, Alibaba, and Tencent, which are equivalent to these giants. In the window period of the Internet and in the era of unconfirmed data, the company has obtained the window bonus period of big data, using massive user data to occupy the industry moat and grow.

After big data is identified as a production factor, it means that it has to face the distribution of production factors. The distribution of production factors involves the distribution of wealth, which also involves fairness and justice. Therefore, data validation and the huge impact brought about by the fair distribution of data value can be said to be the greatest change of this era.

## 2.2 Identify Market Problems

- **Data centralization monopoly is serious, leading to the use of data for unsavory practices**

The massive amounts of data in the online world are actually controlled by data oligarchs and large-scale data platforms. As long as you have the data of a large number of users, you can perform data analysis and have stronger business competitiveness. Therefore, data is regarded as the core asset of each enterprise. It constantly obtains data from users, freely control network users' data without being responsible for users' data, and only large platforms that master big data can have the right to price data. On multiple Internet platforms, there are more or less big data problems. For example, on a local lifestyle platform, it is relatively cheap for Android users to book a ho-tel, while the same hotel an iPhone user will cost dozens of dollars more. On a certain travel platform, it is cheaper for users who occasionally hire a car, but cost a few dollars more for frequent users. The frequent occurrence of data monopoly and big data has become a serious problem in the Internet industry.

- **Data leakage is serious and user privacy cannot be guaranteed**

As users passively or actively hand over the ownership and use rights of data to third-party platforms, a large amount of private information and data are maliciously acquired, used, leaked, and even sold by third-party platforms. After personal information is leaked, it is often subject to information harassment, advertising harassment, fraudulent information induction, etc. This may lead to many problems such as personal safety, personal property safety, etc. However, users do not have any rights protection channels and cannot guard against it. The anonymity of blockchain data encryption can effectively solve the problem of personal privacy data leakage and as well as plagiarism.

- **Data islands, each centralized entity blocks data liquidity**

In all aspects of social development, data needs to be shared, open, and fair use. Because data is monopolized and controlled by various centralized platforms, valuable data cannot be efficiently transferred and circulated. Data cannot be correlated with each other, and their choices are not compatible. Instead, their own data moats are established, which creates a serious problem of information and data islands.

- **Lack of credible data value transfer system**

In the era of digital economy, data has become the foundation of social productivity. The operation of all economic and social organizations cannot be separated from the support of huge data. However, data nowadays is transmitted freely and without a bottom line. It is often used by third-party agencies or platforms to sell, transfer, and exchange to each other to form commercial benefits. However, the creators and providers of huge data commercial benefits-the majority of users, are deprived of the right to share data benefits. Which is equivalent to being deprived of the value of data. Only by constructing a good data right confirmation system and data value conversion system, and perfecting a fair data distribution system can data generate real value and turn society into a credible value data society.

## Ecosystem

The KorthoChain ecology is a new ecology of shared data economy based on the openness, mutual trust, and inclusive quality of the blockchain. A large number of community users, investors, technology developers, advertisers, service providers and other parties jointly participate in ecological maintenance and development. The KTO Chain is based on blockchain, smart contract, DSL, PPOS and other technologies to protect the interests of various participants while solving the pain points



faced by data confirmation in various industries. It effectively integrates various industry data resources and builds multi-party participation and multi-party based on KTO. Participants benefit from the new ecology of shared data along with various DAPPs such as data media application DAPP, local life O2ODAPP, membership platform DAPP, and decentralized financial platform DAPP. Multi-format use case such as urban lifestyle, localized services, membership services, product traceability, traceability cloud, and AI data analysis have been realized. We will comprehensively build a new future-oriented, trusted value Internet economy, and allow people to enter a new era of more open, mutual trust, quality, and inclusive sharing of value data.

- **User groups**

User groups play a pivotal role in the entire Ketu Chain ecosystem. They are the users and promoters of smart contracts and DAPPs, the creators and providers of all data on the chain, and the creators and creators of all relationships in the chain. They can play a decisive role in the maintenance and development of the Ketu Chain ecosystem.

### **1. Community Users :**

A large number of community users can use multiple DAPPs for block chain cognitive learning, local lifestyle, group buys, commodity traceability, decentralized transactions, investment in encrypted digital assets and other decentralized and trusted exclusive services. KorthoChain realizes the confirmation and privacy protection of data and assets of users in the community through blockchain technology. Community users conduct commodity consumption, provide activity, data and other behaviors through the DAPP application based on KorthoChain. The value of their contribution and the data generated will form a contribution value. The incentive of their equity tokens is measured according to the contribution value and comprehensive computing power. The higher the contribution value, the more equity token rewards will be obtained. The obtained tokens can be used for consumption within the ecology, and also complete global peer-to-peer circulation through blockchain wallets, obtaining real economic value incentives, and return the value of data to users themselves.

### **2. Investors :**

Blockchain and smart contracts will lower the investment threshold for investors and protect the interests of investors; Building a trustworthy value network, and carrying out various financial activities such as commodity crowdfunding, service crowdfunding, equipment crowdfunding, mutual insurance, etc. based on smart contracts. The various ecological tokens of KorthoChain represent the value of its application. All investors who



recognize its ecological application hold the tokens of the corresponding platform, which means that they stand together with the ecosystem and provide a sufficient economy for the development and growth of the system. As the ecology of the KorthoChain continues to enrich and the consensus of the community continues to increase, the value of the ecological tokens of the KorthoChain will also gradually increase, thereby providing investors with substantial economic returns.

### **3. Technology Developers**

The technical service provider will be responsible for the contract deployment and technical support of the entire ecosystem. Technical service providers are important participants in ecological maintenance. They, and other participants will work together to achieve sustainable ecological development. The underlying technology code of KorthoChain is completely open and open source. Anyone and any organization can develop and deploy ecological applications based on the underlying technology of KorthoChain. The support of the majority of community developers for the underlying technology of KorthoChain is also an important driving force to help perfect the ecology of KorthoChain and progress.

### **4. Advertisers, service providers**

When external advertisers or service providers cooperate with the KorthoChain ecosystem, they need to use the Kortho Token as a cooperation medium, which can provide sufficient liquidity and value empowerment for the Kortho Token. Advertisers and service providers are also an important driving force for the Kortho ecology, they help Ketu Chain to expand its influence, popularize the consensus and scope of use. They let the wider community understand, agree and participate in the Kortho ecology, and let the KorthoChain grow step by step.

#### **• Use cases**

Use case is the general term for community users to use various DAPPs to conduct various activities online or offline. In this process, all participants are not only consumers, investors, and data providers of products in each scenario, but also the beneficiaries and builders of the ecology.

Regardless of the participants, they follow the same principles in the ecology :

#### **1. Openness**

In the ecology of KorthoChain, openness and cooperation are the first principle. All participants in the ecology open part of their data to other nodes, such as transaction informa-

tion, product information, service information, etc., because KorthoChain is decentralized. In the public chain, these information are all encrypted with high strength. It is also because of the use of the most basic feature of the blockchain: encrypted data is irreversible, making the data on the chain more secure and reliable. At the same time, due to the use of distributed ledgers technology, all transaction records, contracts and other information cannot be tampered with or lost, which further guarantees the security of transactions. Participants in the ecosystem follow uniform standards and technologies, making cooperation between nodes easier and more diverse, and the benefits generated will benefit the entire ecosystem.

## **2. Mutual trust**

In the traditional Internet or various traditional industries, it is difficult to achieve mutual trust. For example, in the area of local lifestyle, low-quality goods and services have produced the effect of inferior products driving out good ones, and businesses are pursuing profits and ignoring quality. On the KorthoChain, since all transaction records will be on the chain, any bad business behaviors of the merchants are faithfully recorded, and consumers' evaluations of the merchants are also recorded on the chain based on objective facts, and are based on the blockchain. These records cannot be tampered with or destroyed, and everyone's credit information has also been reviewed extensively based on this. At the same time, those fine merchants who value credit and quality will have better and better credibility, which will be recognized by more consumers and will gain more and more benefits from the ecology. In addition, good merchants can also get more token rewards, which in turn enable merchants to further reduce operating costs, making the good ones better, and the bad ones eventually fades away.

## **3. Token Incentive**

The ecosystem of KorthoChain is a highly liberalized combination of all participants. Each participant is not only a user of ecological resources, but also a contributor of resources. For example: Consumers purchase goods from merchants to promote consumption, merchants provide goods or services beyond imagination, consumers pay for sharing, organizations or individuals introduce necessary resources for the ecology, provide voluntary services for ecosystem management, etc., all of which will receive the corresponding token incentives. These token incentives are issued in the form of tokens into the account designated by the recipient, which can be consumed and paid within the ecological scope, so that merchants can reduce costs and return benefits to the ecology; it can also increase consumers' desire to consume, which also makes each participant more motivated to carry out ecosystem design.

## 4. Asset confirmation

Asset confirmation is a more extensive and advanced application of blockchain technology. Since the data information on the KorthoChain is ir-reversible, non-tamperable and immutable after being encrypted, it becomes possible for the asset to be chained as an asset on the chain, plus a pass. The value given by the economy makes these assets become items that can be traded freely and safely. The assets can be clearly attributed to certain organizations and individuals. All this information will be fully recorded on the KorthoChain, making them assets. When financing on the basis of assets, it is no longer necessary to list tedious asset certificates. While increasing the credibility of asset holders, it simplifies financing procedures and lowers the financing threshold. In addition, the assets that can be chained through confirmation are no longer limited to tangible items. Intangible assets can also be confirmed and chained in this way, thereby expanding the scope of financing.

## Ecosystem Application

### 4.1 Decentralized Financial Services (DeFi)

KorthoChain establishes financial service applications through blockchain and smart contracts. Blockchain technology builds a trustworthy value network, and smart contracts ensure the interests of participants

Due to the immutable nature of information on the blockchain technology chain, it is possible for assets to be linked to the chain to confirm rights. This provides the basis for financial services on the KorthoChain. After the high-quality assets on the KorthoChain are confirmed, the rights of investors are protected through the smart contract KorthoChain, which eliminates



the possibility of default.

KorthoChain provides flexible and efficient decentralized financial services for investors and community users through multiple methods such as encrypted digital wallets, pledge voting, DeFi liquidity mining, and DEX decentralized exchanges.

KorthoChain Equity Token KTO adopts a pledge mining system. All KTO holders in the consensus community can pledge KTO to vote to obtain additional KTO income, which can be redeemed at any time, which is convenient and flexible. DeFi liquidity mining is based on the DeFi experimental protocol built by the developers of the underlying smart contracts of KorthoChain. The DeFi experimental protocol built through the underlying technology of KorthoChain has the advantages of fast speed, low handling fees, and low operating thresholds. In this way, some Ethereum migrated users and developers will come to the KorthoChain community to develop and collaborate; in the decentralized exchange, users no longer need to worry about the security of assets controlled by the centralized platform. Through the exclusive sub-token of the DEX platform, the development of the DEX ecosystem is independently governed, including currency listing, voting, trading, etc., so as to create a more open, democratic and efficient digital asset trading environment.

#### **4.2 KorthoChain Token Incentive**

Any capable enterprise, institution or individual in the ecosystem, considering business development, can develop their own business tokens on the KorthoChain by virtue of their high-quality assets or excellent business models, and circulate them among other businesses or trades. We call it equity token. This is completely unimaginable under the traditional model. The issuance of currency used for payment and circulation can only be carried out by the central agency, and merchants and individuals can only use and circulate, and the exchange loss caused by overseas trade will eventually be passed on to consumers.

This kind of equity token can be the right to use products and services, or it can be a voucher for sharing future benefits. KTO has become the link between the various rights and interests tokens, which can effectively launch the construction of a cross-industry and cross-field multi-industry cooperation community and promote the prosperity and development of the ecology of various industries.

The above use cases transformed traditional offline operations and centralized management to KorthoChain, they will cause a chain reaction in the ecology, making it possi-

ble for each enterprise or platform to become a financial system. The use of emerging technologies makes mutual trust between people simpler and safer, and an autonomous community ecology will gradually grow and become the mainstream form.

### **4.3 Data traceability and validation**

The traditional Internet industry generates a lot of data, which is often stored in third-party organizations. On the one hand, centralized and opaque storage methods reduce the credibility of data and reduce the value of data. On the other hand, the ultimate beneficiary of data belongs to a third-party organization rather than the producer of the data.

Based on blockchain technology, smart contracts, and DAI, KorthoChain has built a precise data service scenario for the entire ecology, so as to achieve data traceability, data verification and privacy protection. Moreover, the data producer—ordinary user, also becomes the owner of data ownership. The majority of users can provide their data and information to the ecology in a paid way, so as to prevent data from being misused, and at the same time return the revenue generated to the user.

The KorthoChain ecosystem will use blockchain technology to confirm the data rights of device personal data, consumption data, personal profile data, basic attribute data, and operator data. Through smart contracts, digital advertising purchases, personalized digital marketing, business analysis and applications, portraits and credit reports, privacy data are prevented from leaking, and accurate advertising services and data privacy protection are realized. Advertisers use smart contract transactions, pay KTO, and use effective structured data to carry out precise advertising. KTO Chain will reward all participants in the inclusive advertising system by rewarding KTO.

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# Technical Model and Development Blueprint

## 5.1 Technology Architecture

KorthoChain will be a completely autonomous main chain that integrates a variety of advanced technologies, making KorthoChain reach an unprecedented height in terms of fault tolerance mechanism, smart contract deployment, network communication, and ecological DApp management. KorthoChain adopts the PPOS (POW+POS) consensus mechanism to ensure the safe and reliable operation of the whole chain nodes. It also adopts the DSL language to make the deployment of smart contracts easier and more efficient. It uses the ED25519 signature algorithm to verify the inter-block Consistency, the Sha3 encryption algorithm is used to prevent the information on the chain from being leaked and tampered with. At the same time, there are reliable communication protocols and network protocols to ensure the efficient and safe transmission of information on the chain. All data such as transaction content and user portraits are safely stored to achieve data protection and reliable value transfer. As an open public chain, KorthoChain helps small and medium-sized enterprises to quickly build their own DAPPs through the expansion of the application technology ecology, so that they can flexibly participate in the ecological construction and enjoy the dividends brought by the ecology.

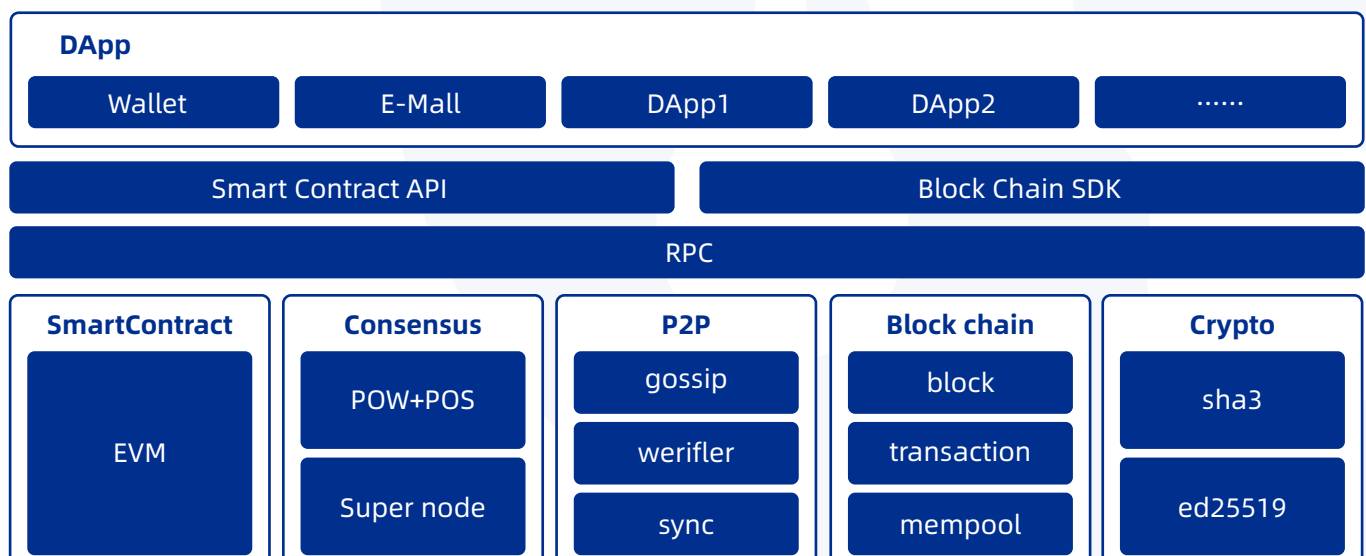


Figure 5-1 KorthoChain Technical Architecture

## 5.2 Core Technology

### • PPOS (POW+POS consensus mechanism)

Since the emergence of the Bitcoin network system in 2008, many blockchain projects have emerged from time to time, and each block-chain project has its own specific mechanism. But almost all blockchain projects have a starting point, that is, the blockchain is the core of their architecture. Like most distributed accounting systems, network participants of blockchain projects need to agree on the current status of the blockchain. This is what we call consensus. However, it is not a simple matter to reach a consensus on a distributed network by means of efficiency and energy saving. In light of this, Bitcoin and Ethereum's POW have exposed their drawbacks, such as high energy consumption, low efficiency, and monopoly of computing power. Hence, how would KorthoChain avoid these problems? KorthoChain adopts the consensus mechanism of POW+POS to achieve low energy consumption, high efficiency, avoid computing power monopoly, and achieve a consistent mechanism

Simply put, the PPOS mechanism is based on POW plus Proof of Rights, which combines the advantages of the two and balances each other's weaknesses.

KorthoChain adopts the PPOS mechanism, which is the best solution that can be used in the current stage of blockchain development. To a large extent, the problem of inconsistent block information in the network has been solved, and the efficiency and energy consumption problems have also been greatly improved. To a large extent, it solves the problem of inconsistency of block information in the network, and also greatly improves the efficiency and energy consumption issues, greatly improving the transaction performance under the premise of obtaining security guarantees. KorthoChain adopts the PPOS mechanism, which is the best solution that can be used in the current stage of blockchain development. It solves the problem of inconsistent block information in the network to a large extent, and also greatly improves efficiency and energy consumption. The problem makes the entire chain interaction greatly improve the transaction performance under the premise of obtaining security guarantees, which is a degree that other consensus mechanisms cannot achieve. This is a level that cannot be achieved by other consensus mechanisms

### • ED25519 Signature algorithm

Ed25519 is an elliptic curve encryption/signature/key exchange algorithm independently designed by the famous cryptographer Daniel J. Bernstein in 2006. It is completely inde-



pendent of any existing elliptic curve algorithm. Ed25519 is mainly used for signature security in KorthoChain check.

### **The Ed25519 algorithm has the following advantages :**

#### **1. Fully open design**

This feature makes the selection of the parameters of the algorithm straightforward, very clear, without any suspicious points, and will not use parameters of unknown origin. It is very suitable for blockchain projects with large transaction volume and high security requirements.

#### **2. High security**

Even if an elliptic curve encryption algorithm is mathematically safe, it is not necessarily safe in practice. It has a high probability of destroying security through caching, time, and malicious input. The 25519 series of elliptic curves are specially designed to be as safe as possible. The probability of errors is minimized, and it can be said to be the most secure encryption algorithm in practice. For example, any 32-bit random number is a valid X25519 public key, so it is impossible to attack by malicious numerical value. Some branch operations are deliberately avoided when the algorithm is designed, so that it is not used in programming, Reduced the probability of timing attacks with different if branch code execution times. After examining all the encryption algorithms on the market using 12 standards, ED25519 is almost the only one that meets these standards.

#### **3. High Speed**

The ED25519 series curve is currently the fastest elliptic curve encryption algorithm. Its performance far exceeds that of the NIST series, and it has higher security than other algorithms. It is that KorthoChain has both security and efficiency.

#### **• EVM Smart Contracts**

KTO runs on KorthoChain in the same way as ETH on Ethereum, so it is the native currency of KORTH0. KORTH0 supports the programmability of EVM and the compatibility of smart contracts.

#### **• SHA-3 Encryption security algorithm**

Hash functions used to generate data fingerprints have been used in various fields of economic life, protecting data security on the blockchain at all times. SHA-3 (Keccak) is

the third-generation hash function standard confirmed by the American Institute of Standards and Technology, and is the most important hash function in the next few years

SHA-3, formerly known as Keccak algorithm, is an encryption hash algorithm. Due to the successful cracking of MD5 and the theoretical cracking of SHA-0 and SHA-1, NIST felt that it needed a different and replaceable encryption hash algorithm, which is now SHA-3.

This is an encryption algorithm that has been more rigorously demonstrated, so that the encryption performance of the blockchain after adopting this technology has achieved unprecedented heights, but at the same time, there is no significant drop in performance, which has become the current blockchain project. The best security encryption algorithm used. After KorthoChain adopts SHA-3 encryption technology, its security has been greatly improved, and it provides reliable security guarantee for transactions in the ecosystem and on-chain of sensitive information.

#### • **Badger Key-Value (KV)**

An embeddable, persistent, simple and fast key-value (KV) storage database is essential for every blockchain project. Badger is written in native Go, which is the fastest storage method in Go. Badger is reading randomly Time is at least 3.5 times faster than RocksDB. For data between 128B and 16KB, the data loading speed is 0.86x-14 times that of RocksDB.

The advantages of Badger are obvious: random read speed, can be directly embedded in applications, simple and convenient to use, support for multiple loading modes, optimized for SSD, written in pure Go, and more compact based on LSM-tree.

#### • **DApp Ecosystem**

On KorthoChain, users can quickly develop their own independent distributed application DAPP based on a large number of mature components. So as to create a three-dimensional ecosystem and build a one-stop blockchain content and value delivery network

Shared retail users use KTO Chain as their DAPP construction, purchase corresponding technical support products or components, and use KTO as a token for circulation between DAPPs. Third-party developers can also provide technical services to the Kortho-

Chain ecosystem to obtain token rewards. KorthoChain is an open and open source platform. While continuously forming more commercial application DAPPs, we welcome other partners to participate in improving the entire platform ecology and promote innovation and technological breakthroughs in data security and data value transfer.

### 5.3 Development blueprint

After several years of development, KorthoChain has begun to take shape. Our next goal is to build KorthoChain into a system that is more open, international, high-throughput, more secure and takes into account the right to data privacy. In the near future, we will focus on R&D and technological breakthroughs in the following areas:

- **PoS-based consensus algorithm and a more open ecosystem**

The KorthoChain technical team is further improving the code and technical documentation, and is preparing to open it to third parties, blockchain developers and users around the world, so as to facilitate their participation in order to make the Ketu ecosystem more decentralized. We are preparing to establish developer communities and block production nodes in Japan, South Korea, the United States, Europe and other places. At the same time, on the basis of PPOS, we will join the PoS (Proof-of-Stake) consensus algorithm, and all nodes will determine the rights and rewards of the block based on the amount of KTO pledge. Compared with traditional PoW, PoS consumes less computing power and energy, and can support higher throughput.

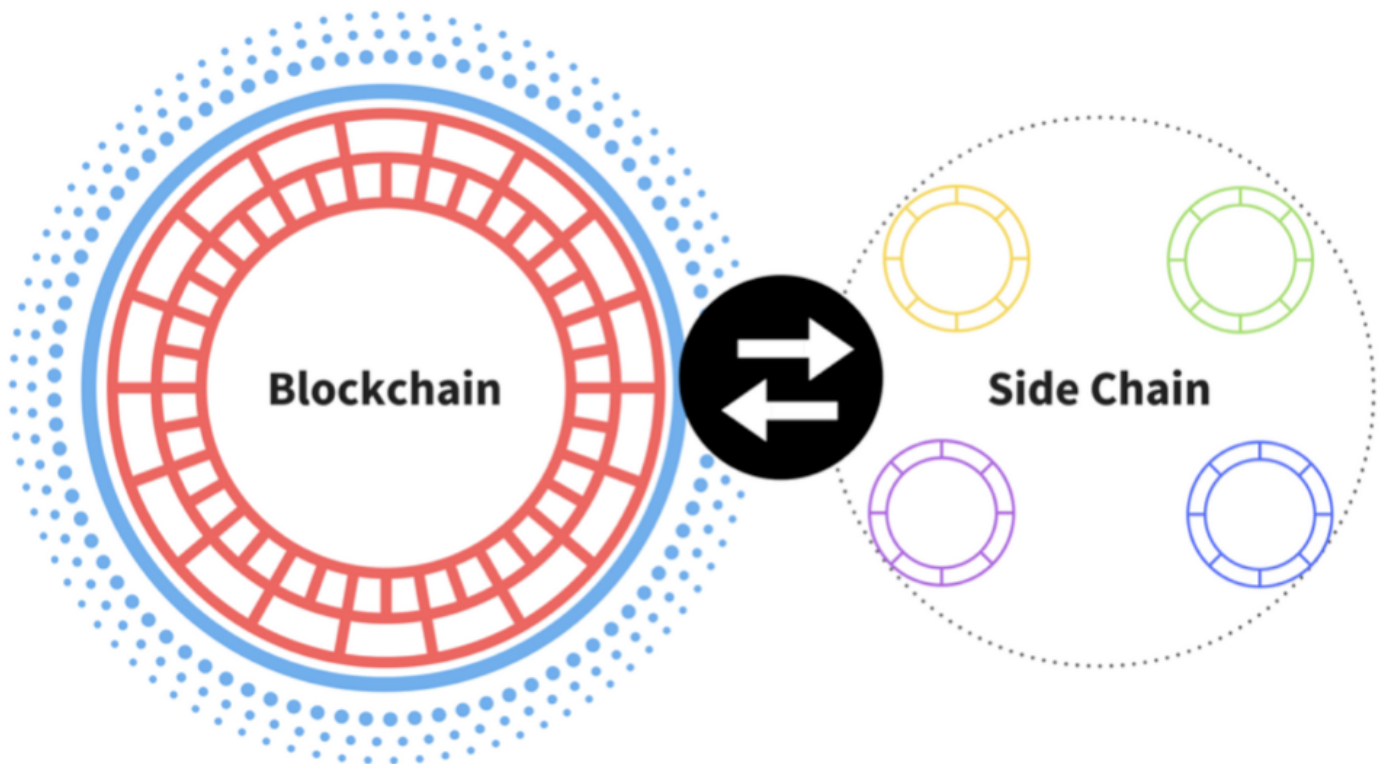
- **Layer 2 expansion plan**

With the continuous expansion of blockchain application scenarios, its throughput requirements will become higher and higher. In the future, it may be necessary to reach the order of hundreds of thousands of transactions per second of traditional payment systems such as Visa and Alipay. As a distributed decentralized system, it is technically challenging to achieve such a large throughput only in Layer 1. A better solution is to add a Layer 2, which is also the current direction of major public chains. In the field of layer 2 technology, the current main attack directions of Ketulin include ZK rollups, Optimistic rollups, and off-chain payment channel technology similar to Lightning Network.

- **Multi-Chain Support**

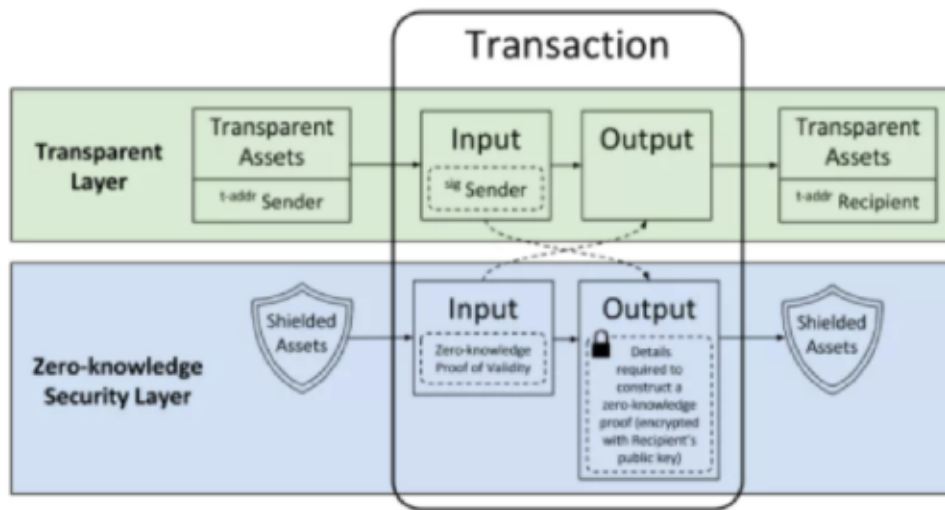
Due to different application scenarios, the future blockchain is likely to be a state where

multiple chains coexist, so the intercommunication between them will be an important issue. The KorthoChain team is also making technical preparation in this regard. We may participate in cross-chain systems such as Polkadot and Cosmos in the future, or develop our own cross-chain communication or sidechain mechanisms, as shown in the figure below :



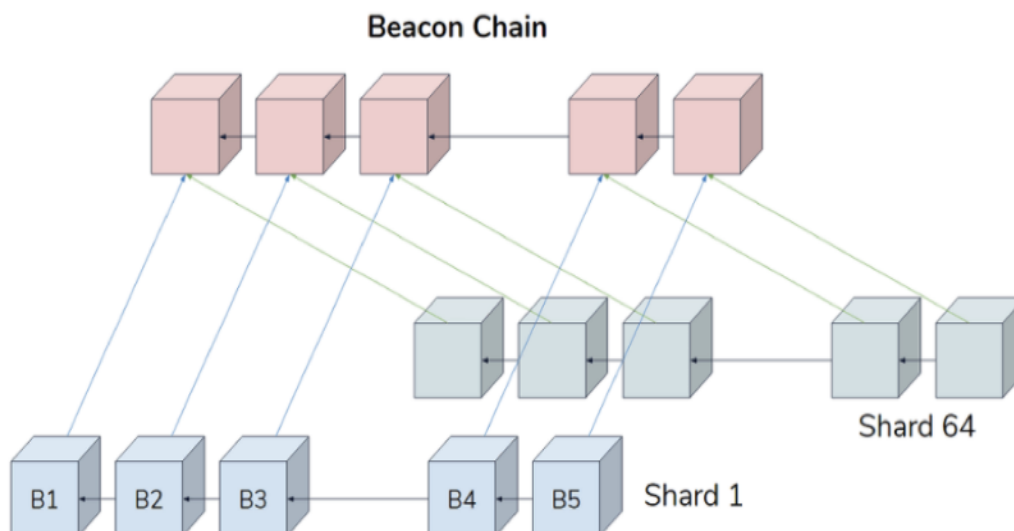
#### • Private Transaction Support

An important application scenario of KorthoChain is the traceability and validity of data, so the privacy of data must be a key technology. In this regard, we will support Zero Knowledge Private Transactions based on zero-knowledge proof. The address and amount of such transactions are confidential, but at the same time the initiator can also selectively share this information with specific groups of people, and it can also meet the needs of regulatory agencies. The structure of private transactions is illustrated in the following figure :



• **Sharding**

In most existing blockchain systems, all nodes participate in all transaction operations and verifications, which severely restricts the overall throughput improvement. To change this situation, a technology that can be used for reference is the sharding technology in the database, that is, the nodes are divided into multiple groups, called Shards. Each task is completed by one group, so multiple groups can be processed in parallel. The tasks are then summarized (for example, using a Beacon Chain), so that the overall throughput can be improved, as shown in the following figure. In terms of sharding technology, the KorthoChain team is currently in the technical preparation stage, and we are closely tracking the latest developments in this field by technical teams such as Ethereum, Harmony Blockchain, and Near Protocol.



# KTO INTRODUCTION

## 6.1 KTO Introduction

KTO is the decentralized equity token of the Kortho public blockchain platform.

## 6.2 KTO Advantage

KTO, as a general certificate of rights and interests in the KorthoChain ecosystem, does not require a third-party institution as a credit endorsement, point-to-point transmission, and a multi-node confirma-

tion backup mechanism, making it extremely safe, transparent and queryable, and protecting the rights and interests of participants.

## 6.3 KTO Circulation

In the KorthoChain ecosystem, the circulation of KTO will maintain the common interests of the entire ecosystem participants. The point-to-point circulation of KTO from issuance to sub-application tokens to global block-chain wallets will be realized in a multi-directional flow.

In the area of ecosystem applications, KTO Chain, with the continuous expansion of various DAPP applications, the number of people who are empowered and rewarded is increasing, and the volume involved increases, the scope of holding and circulation will be broader, and the total amount of KTO is held constant, as the number of rewarded KTOs continues to decrease, a multi-party scarcity is formed, which not only guarantees the rights and interests of all parties, but also makes KTOs more credible, and at the same time makes the ecology more active and healthy.

### **KTO Principles of Value Circulation System Construction :**

As an ecosystem participant, technical service providers can use the underlying technology of KorthoChain for free, develop their own commercial applications, and provide high-quality technical services to the ecology of KorthoChain. Technical service providers participate in the ecological construction of KTO Chain with their own technical advantages, which can expand their popularity, but also benefit from it and enjoy the KTO dividend.



# ISSUANCE AND DISTRIBUTION

## 7.1 Foundation governance

Kortho Foundation established the Kortho Foundation in Singapore, and the Kortho Foundation's ecology is managed and developed by the Kortho Foundation. The overall structure of the Kortho Foundation is shown in the following figure. The decision-making committee governs the three sub-departments of the Technology Development Committee, namely the Finance, Personnel Management Committee and the Project Operation Committee. They are responsible for the formulation and implementation of the technol-



Figure 7.1 Kortho Foundation organization chart



ogy development strategy; the formulation and implementation of the supervision of the financial system; Decision-making and execution of overall project operation and marketing. The members of the decision-making committee are changed every four years, and the members are generally recommended by each subcommittee with two representatives, plus one representative each from the project investor, the community, and the value network team. The members are generally held by persons with outstanding abilities in the relevant industry.

The Kortho Foundation advocates a transparent and efficient operation concept to promote the healthy development of the value network ecosystem. The governance structure mainly focuses on the effectiveness, sustainability and capital security of project management.

### **Organizational functions of the Kortho Foundation:**

The Kortho Foundation advocates a transparent and efficient operation concept to promote the healthy development of the value network ecosystem. The governance structure mainly focuses on the effectiveness, sustainability and capital security of project management.

The Kortho Foundation is an independent and democratic governance institution in the KorthoChain ecosystem. Its functions include:

Firstly, maintaining the stable operation of the KorthoChain ecosystem, allowing ecological participants to enjoy the smart retail system freely, equally, and credibly, and helping the booming development of the retail economy.

Second, being committed to building a free, equal, efficient, and mutually trusting smart retail value ecosystem. Together with other ecosystem partners, open governance of its resources.

Thirdly, providing an open and sustainable development platform and ecosystem for more users and developers.

The Kortho Foundation will invest resources in three specific goals of research, development and governance. The foundation will hire a development team to promote this series of work, improve the technology of the entire ecosystem, and continue to maintain the open source code base, so that all members of the ecosystem continue to benefit.

Over time, the Kortho Foundation may be replaced by other more innovative governance

methods, but establishing a formal governance institution is an important step in this process.

### **Fundraising use of the foundation :**

The mission of the Kortho Foundation is to promote the development of blockchain technology from the Internet to a value network. It plans to raise funds for development through the issuance of KTO coins. The foundation will invest the raised funds in the following directions :

(1) Research and develop the core technologies of Kortho's public chain and DAI, DFS, DID and other core technologies, as well as the development and expansion of various DAPP applications based on Kortho's chain. In addition, there is also forward-looking research on basic technologies and applications of blockchain. ;

(2) Promote to various ecological participants around the world, including but not limited to: advertising, publicity and marketing activities ;

(3) Through the combination of advanced application technology and operating methods, the Foundation strives to construct an emerging economic ecology of smart retail with global human participation, and provides tools and platforms for networked and digital services for all parties involved in the retail field. ;

(4) Hardware procurement of computing power, network, security equipment, and cloud service rental costs ;

(5) Other incidental expenses.

### **7.1 KTO Distribution Plan (2 stages)**

The total amount of KTO is 88.48 million, and the total amount is constant. KTO issues standard tokens based on the Ethereum blockchain ERC20. After the KorthoChain mainnet is launched, the current Ethereum-based KTO will be replaced with a 1:1 method. The KTO distribution plan is shown in the figure :

1st stage: The KorthoChain mainnet will be based on the BFT consensus mechanism for voting mining. There are a total of 6 creation nodes and 13 super nodes. A total of 19 super nodes participate in voting mining. Mining will be halved in 4 years. A total of 22 million KTOs have been dug up to date.

2nd stage: KorthoChain mainnet switches to the consensus mechanism of POW+POS for mining, and introduces a mode of mining with fully open source node miners. The staking mechanism will be released in a stepped manner around a 120-day cycle

# TEAM INTRODUCTION

## 08 Core Team



KorthoChain has a strong and experienced technical team, including Silicon Valley technical experts, members of the industry's top research institutes, senior engineers, etc, which have played a key role in the establishment of KorthoChain's underlying technology. At the same time, the global market and operation team has made KorthoChain's ecological influence and consensus stronger. It is the efforts of all team members that make the development of KorthoChain more stable and longer-term.

# DISCLAIMER

## 9.1 Legal Notices

Except for the situations clearly stated in this white paper, the Kortho Foundation hereby confirms that the Kortho Foundation does not make any representations or guarantees to KTO (especially its marketability and specific functions). Anyone who participates in the KTO public exchange plan and the behavior of redeeming KTO is based on their own knowledge of the KorthoChain project and KTO. Without prejudice to the universality of the foregoing content, all participants will accept KTO as it is after the KorthoChain project is launched, regardless of its technical specifications, parameters, performance or functions. Please refer to the official website description for the specific disclaimer.

The Kortho Foundation hereby expressly disclaims and refuses to bear the following responsibilities :

- (1) Anyone who violated any country's anti-money laundering, anti-terrorism financing or other regulatory requirements when redeeming KTO ;
- (2) Anyone who violates any statement, guarantee, obligation, promise or other requirements stipulated in this white paper when redeeming KTO, and the resulting inability to withdraw KTO ;
- (3) KTO's public exchange plan was abandoned for any reason ;
- (4) The development of KorthoChain failed or was abandoned, and the resulting inability to deliver KTO ;
- (5) The postponement or postponement of KorthoChain development, and the resulting inability to reach the previously disclosed schedule ;
- (6) Errors, defects, defects or other problems of KorthoChain source code ;
- (7) Failure, crash, paralysis, rollback or hard fork of the main chain public chain on which KorthoChain's existing tokens depend ;
- (8) KorthoChain or KTO fails to achieve any specific function or is not suitable for any specific purpose ;
- (9) Failure to disclose information about the development of KorthoChain in a timely and complete manner not due to subjective reasons ;
- (10) Any participant leaks, loses or destroys the private key of the digital cryptocurrency or token wallet ;
- (11) KTO's third-party crowdfunding platform or trading platform breach of contract, violation, infringement, collapse, paralysis, service termination or suspension, fraud,

misoperation, improper conduct, error, negligence, bankruptcy, liquidation, dissolution or closure of business ;

(12) The agreed content between anyone and the third-party crowdfunding platform is different, conflicting or contradictory with the content of this white paper ;

(13) Anyone's speculation on KTO ;

(14) KTO's listing or delisting on any exchange ;

(15) KTO is classified or regarded as a currency, securities, commercial paper, negotiable instrument, investment product or other things by any government, quasi-government agency, competent authority or public agency, so that it is prohibited, regulated or restricted by law ;

(16) Any risk factors disclosed in this white paper, as well as damages, losses, claims, liabilities, penalties, costs, or other negative effects related to these risk factors, resulting or accompanying them。

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We encourage users to interact, discuss, organize, and participate in the Kortho Foundation' s social media and email platforms and between users or anyone interested in the Kortho Foundation' s products. To ensure that the discussion is related to the products provided, we will do our best to monitor user participation on the platform, but there may still be user statements, comments and opinions that we cannot monitor. We kindly ask to respect other users in your comments. We reserve the right to delete any content that we believe contains anti-humanity, anti-government or personal attacks, abuse, obscenity, defamation, threats, harassment, abuse, slander, hatred or embarrassment to any other individual or individual, and the right to clean up third parties Ads, chain letters or "spam". Please note that any published content may be read by tens of thousands (or even hundreds of thousands) and many years later readers. Therefore, users should be cautious when posting on any of our social media sites. At the same time, we also reserve the right to terminate the participation of users who publish such content. Any views and opinions published on our social media sites do not necessarily represent the views and opinions of the KorthoChain Foundation, and should not be regarded as

KorthoChain's promise to anyone on anything or any event. Everyone can see your comments, so for your safety, please do not include your phone number, email, address or other personal information in your posts. In accordance with any applicable laws and regulations (collectively referred to as forward-looking statements), certain information provided on our website and other documents may contain "forward-looking information", including "future-leading financial information" and "financial outlook." Except for statements of historical facts, the information contained in this article constitutes forward-looking statements, including but not limited to (i) KTO' s estimated performance; (ii) KTO exchange purpose; (iii) expected development of business, projects and joint ventures; (iv) implementation of KTO' s vision and growth strategy; (v) the source and use of funds of the Kortho Foundation; (vi) completion is currently in progress , Development or consideration of the KorthoChain project plan; (vi) publicly disclose the cooperation agreements of KorthoChain's current customers, suppliers and other partners; (vii) the forecast of future liquidity and working capital. We will provide forward-looking statements so that potential convertors have an opportunity to understand management' s views on the future, but these statements are not a guarantee of the Kortho Foundation and should not be overly relied on. These forward-looking statements inevitably involve known or unknown risks and uncertain content, which will cause future results to be materially different from the future predictions in the forward-looking statements, and the KorthoChain Foundation will not make any commitments to these statements.

For further explanation of the risks involved in the KorthoChain community, please refer to the documents issued by the KorthoChain Foundation. Since actual results and future events may differ materially from the expectations of the forward-looking statements, even if the forward-looking statements contained in this document are based on reasonable assumptions deemed reasonable by the management of the Kortho Foundation, there is no guarantee that the forward-looking statements will be accurate of. Unless applicable securities laws require this, KorthoChain does not undertake the obligation to update forward-looking statements due to changes in circumstances or management' s estimates or opinions. Readers should not be overly dependent on forward-looking statements.

## **9.2 Risk statement**

The Kortho Foundation believes that there are countless risks in the development, maintenance and operation of KTO and other cryptocurrency and blockchain systems, many of

which are beyond the control of the Kortho Foundation. In addition to the other content described in this white paper, each KTO exchanger should also read, understand and carefully consider the following risks before deciding whether to participate in this public exchange plan。

Every KTO exchanger should pay special attention to this fact: Although the Kortho Foundation is established in the Republic of Singapore, the exchange can be exchanged anywhere in the world through the Internet. KorthoChain is not responsible for whether the exchange behavior of the exchange is in compliance with local laws. Should confirm and bear the relevant impact。

Participating in the public exchange of KTO should be a well-thought-out decision-making action. The Kortho Foundation will consider that the exchange is fully aware of and agrees to accept the risk.





# Kortho Foundation



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