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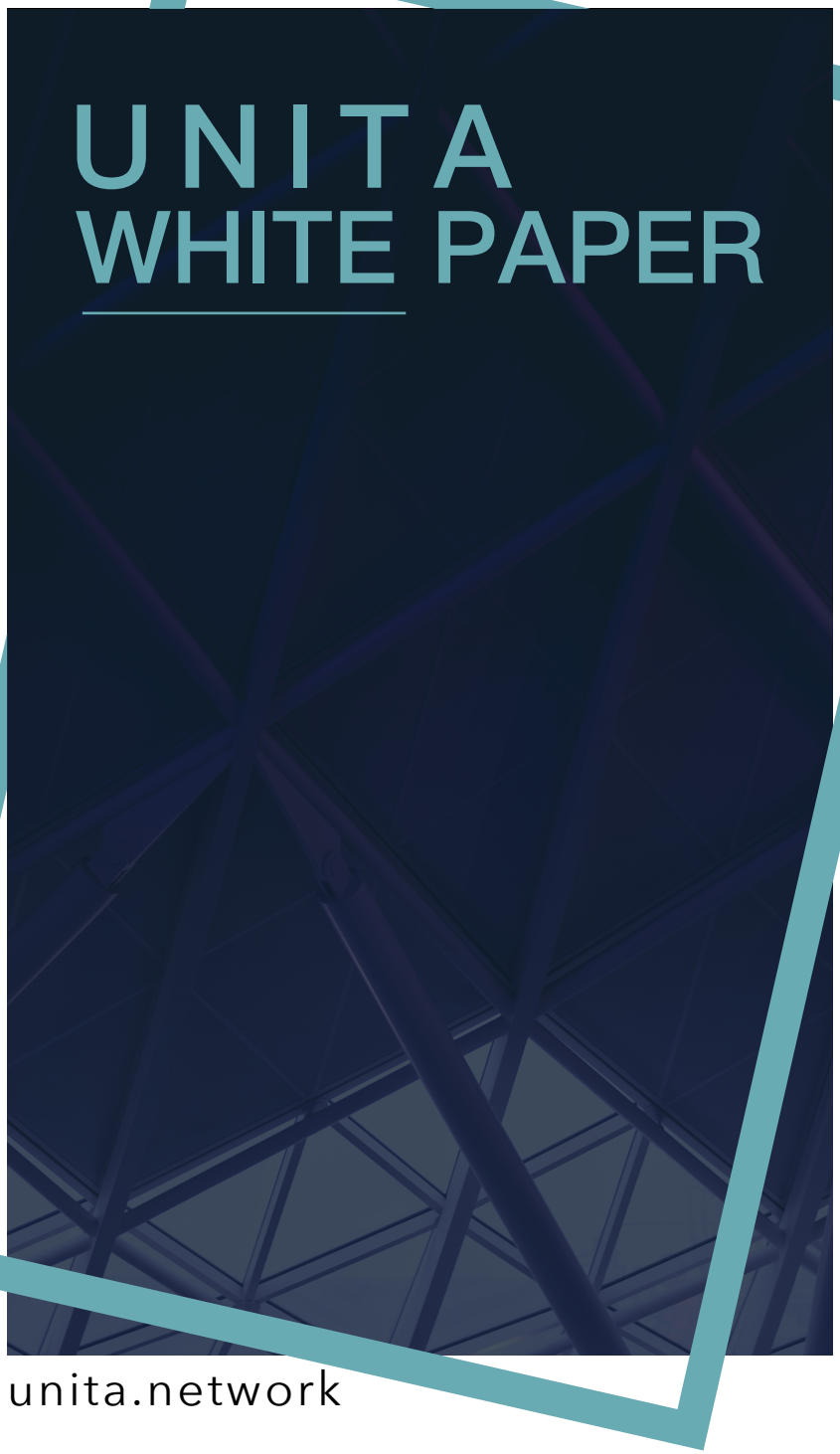
UNITA WHITE PAPER



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Chapter 1
Blockchain and its Applications

1. Introduction to Blockchain Technology

Technology has driven societal progress at every turn. Within the last two to three hundred years, the world has evolved at an unprecedented rate due to the rise of disruptive technologies like the internal combustion engine, telephone, nuclear technology semiconductors, and the Internet. The kaleidoscopic variety of technological innovations has only increased after the turn of the 21st century. One of the most promising of these innovations is blockchain technology. However, whether we can use the blockchain to bring a new technological revolution and improve the way people operate is a proposition that requires further consideration.

1.1 Blockchain Technology: Solving Issues of Trust and Realizing Value Transfer

The few decades of the Internet's development led to the rise of a diverse digital ecosystem that includes web services such as social media, e-commerce, and cloud computing. A byproduct of this new ecosystem is the rising importance of data collection in the modern age. In his book, Homo Deus, Yuval Harari stated that organisms are algorithms, and that life itself is data processing. Data collection can reduce the costs associated with information search, collaboration, and exchange.

However, significant barriers currently exist in these commercial activities. For example, without the verification of trusted third-party institutions, it is difficult for users to confirm their and other's identities on the Internet. This issue of verifying identity and securing trust in online exchanges is currently costly and inefficient.

Current solutions have not entirely solved the data trust issues for economic and social activities happening on the Internet. Companies need to ensure the integrity of their data and make it resistant to hacks. Additionally, the public wants their data privacy given the numerous abuses from large trusted entities; however, mastering one's data is no easy task in today's world.

What kind of technology can meet the needs of all parties in society to work together to process data while ensuring data security, delivering real value and solving the issue of trust in online exchanges?

According to Satoshi Nakamoto, blockchain technology is one solution that can meet these needs. Satoshi explained the idea of a cryptocurrency called a "bitcoin", and an underlying protocol for a peer-to-peer cash system. This protocol sets a series of rules based on distributed computing technology that allowed billions of devices to exchange information securely with each other without third-party intermediaries.

Blockchain technology derived from Bitcoin is similar to the development of TCP/IP, the Internet infrastructure protocol of the 1990s. The new Internet–based on blockchain is called a value network. Some have also compared blockchain to a more specific SMTP protocol, believing that the Internet executes information transfer, while the blockchain successfully achieves value transfer.

Just as the Internet has made tremendous contributions to human society since it became more widely used in the 1990s, blockchain has gained popularity as the driving force for the next catalyst in the digital age. In 1994, Kevin Kelly conceived a distributed, self–organizing and efficient man–made system in his heuristic book, Out of Control. The book provides a series of examples of nature and manpower. This book also contains a parallel overview of the unique characteristics of the blockchain.

1.2 Characteristics of Blockchain

In 2008, Nakamoto first proposed the concept of a "chain of blocks", which is now referred to as a blockchain, in his well–known white paper on Bitcoin. Since then, blockchain technology and its applications have been developed by a community of developers, users, and institutions. These developments have resulted in the division of blockchain into three types: public blockchains, consortium blockchains, and private blockchains. There are no restrictions to participation in a public blockchain, but a consortium blockchain only authorizes designated companies and individuals to participate. Regardless of the type of blockchain, however, all chains have the following characteristics:

Distributed Database

Blockchain technology is a distributed database. Due to the redundant storage of data, the consistency and accuracy of the entire system data are guaranteed–– even if a few nodes contain tampered data.

Consensus Mechanism

The blockchain ensures the consistency of information in the database through a consensus mechanism. The consensus mechanism is akin to a set of pre–set rules. For example, Bitcoin uses a Proof–of–Work (PoW) mechanism to allow participants to serve the network by writing new blocks into the chain and obtain block rewards through hashing. Block producers cannot be predicted, so the database remains accurate and resistant to tampering. Most consortium blockchains use Byzantine Fault Tolerance (BFT) as their primary consensus algorithms.

Decentralization

The term blockchain denotes a network composed of many nodes. Different blockchain applications give rise to various types of systems. A completely decentralized peer–to–peer network comprising of full nodes or a weak centralized network composed

of supernodes and common nodes can be formed. Full nodes or supernodes are responsible for maintaining data ledgers in their respective networks. Malicious behaviors of a few nodes cannot cause the entire system to crash.

Cryptographic Basis

The principles of cryptography underlie blockchain technology and its applications. These principles include concepts such as the Merkle trees, elliptic curve algorithms, hash algorithms, asymmetric keys, and a series of other algorithms that ensure that the blockchain network remains tamper resistant.

Untampered Information

All the information recorded on the blockchain database is covered by an algorithm and consensus. The more blocks that are generated, and the more nodes that confirm that block, the harder it is to manipulate the data by tampering a few nodes.

1.3 The Importance of Blockchain: Value Networks

In The Naked Corporation, Don Tapscott and David Ticoll propose that trust in the business world requires “four principles”: honesty, a consideration of mutual interests, responsibility, and transparency. Before the innovation of blockchain technology, trust in the business world relied either on personal integrity or other institutional intermediaries that could verify information for cooperative efforts. However, based on its inherent design principles, blockchain technology has the potential to help companies and individuals follow the principles of honesty in business activities, ensure safety and reliability of data and transactions, and solve the crisis of trust.

Rather than trusting the trader, blockchain technology is trust by design. The blockchain traces data so that data cannot be tampered with, which ensures the security and transparency of the data on the chain. Further, the blockchain has little risk of being attacked or stolen by third-party organizations. The distributed blockchain data storage dramatically increases the costs of hacking and lowers the potential dangers of forming partnerships and alliances.

2. Exploration and Application of Blockchain

Using blockchain technology, people can trade currencies, futures, foreign exchange, digital assets, and other financial assets more efficiently. It can even trade intangible assets which previously could not be appropriately valued during the Internet era, such as patents, copyrighted goods, and knowledge. If judiciously applied, blockchain technology is likely to create real economic activity and advancements in numerous industries. Further, the Internet would progress from an information sharing platform to a value sharing platform.

Blockchain technologies' structure guarantees the consistency, accuracy, and tamper-proofing of data, and constructs a world where data can provably be unique. The public began to recognize that blockchain transfer is no longer a replica of the data, but a genuine, unique, and credible value. This value network is also being explored and applied globally. At present, the blockchain ecosystem is mainly divided into public blockchains, consortium blockchains, private blockchains, and decentralized applications derived from blockchain networks, as well as some platforms and technology companies related to blockchain transactions, security, encryption, and other services according to the degree of decentralization and the difference of application scenarios.

The consortium blockchain is operated by commercial organizations and government agencies, which need authorization before nodes can join, and permitting for read or write permissions. The consortium chains are generally applicable to business operations and governance of companies and societies. For example, Hyperledger, a blockchain project founded by the Linux Foundation, brings together members from all walks of life to combine efforts to commercialize blockchain technology. The startup R3 CEV, a New York-based blockchain company, allies with multinational banks and financial institutions to form the R3 blockchain alliance. Governments also strongly advocate the application of blockchain technology, such as the Estonian National Blockchain Digital Citizenship Project and the blockchain rental project in Xiong'an New District, China. The support and friendliness of governments with blockchain technology will bring more development opportunities to the blockchain.

Among various application scenarios, most of the blockchain projects are in the early stage of exploration. There is still a long way to explore in the actual application and the formation of a standardized and large-scale market.

This is the direction that Unita is working on.

Chapter 2
Unita System Introduction

1. System Overview

The goal of Unita is to fully serve enterprise requirements, to build a value network among enterprises and promote the application of decentralized technology represented by the blockchain. All technical solutions are designed and developed on the basis of needs from enterprises. Unita uses the consortium blockchain as its infrastructure, forming a multiple side-chain system architecture. It combines modules including one-click blockchain, cross-chain trading, data management, and supporting tools including multi-system wallet, blockchain explorer, so as to form a complete solution.

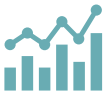
Unita mainly includes the following three modules:

Consortium Blockchain

Unita provides a consortium blockchain based solution for enterprises. Enterprises can customize their own blockchain network by configuring appropriate parameters according to the usage scenarios. The consortium blockchain is based on the newly proposed SCAR (Scalable Consensus Algorithm) and DGP (Decentralized Governance Protocol) to ensure the performance and scalability of the blockchain.

Cross-chain Trading

Unita provides a cross-chain solution named Canal which realizes reading and writing other blockchains on one Unita blockchain. This means enterprises can use other blockchain tokens and interact with other blockchain smart contracts on their own blockchain network. It makes the interaction between enterprise blockchains as well as between enterprise and public blockchains more convenient, realizing value interoperability of different blockchain networks.



Data Management

DDAO (Decentralized Data Access Object) is a middleware which connects block-chains, smart contracts, decentralized databases, and decentralized file systems. Using this technology, enterprises and developers can quickly realize reading and writing operations of data in various decentralized systems, and build their own data applications on the blockchain without caring about the underlying technology imple-mentation.

Based on the technologies above, Unita provide enterprises the following services:

One-Click Blockchain

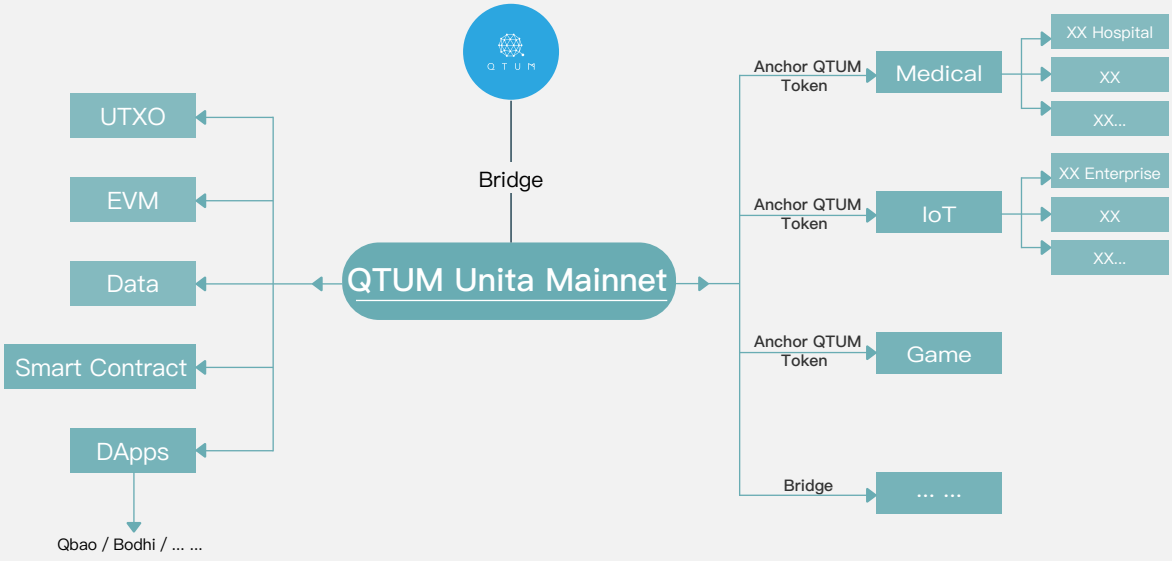
Enterprises can use the one-click blockchain tool to quickly build their own blockchain network to deploy and to run their own decentralized applications.

Development Platform

Unita provides various development tools, application templates and decentralized technology solutions to help enterprises develop decentralized applications.

Storing Data on Blockchain

Based on Unita's data management technology, enterprises can store their own data on a blockchain, providing infrastructure for information publishing, data transferring and other services.



2. Technical Advantage

Unita's design takes into account the needs of enterprises and the business application scenario. Its specific advantages are as follows:

The consortium blockchain is fit for business scenarios

Unita builds blockchain network for enterprises using consortium blockchain technology. The supernodes in consortium blockchains are responsible for maintaining blockchain data, as suits the business situation in which enterprises need to manage the blockchain efficiently. The consortium formed by several enterprises can ensure the security of the blockchain and effectively avoid 51% attack as well as a network fork which are common in PoW (Proof of Work), PoS (Proof of Stake) consensus algorithms.

High performance meets business needs

Low TPS and long transaction confirmation times have always been the bottleneck restricting the blockchain from commercial application. Unita's SCAR consensus algorithm, when the TPS reaches thousands, the transaction confirmation time can be set to one second. At the same time, when network jitter occurs, its performance will not change significantly, keeping strong stability. Finally, the algorithm will be based on the area. The load of the blockchain network dynamically adjusts the parameters to find a balance between high performance and low load time. Suitable for deployment and execution of enterprise-level decentralized applications.

Compatibility connects technology and application

Unita is fully compatible with Bitcoin's UTXO blockchain structure and Ethereum's EVM virtual machine. This means that the Unita-based enterprise blockchain can directly use Bitcoin's wallets and Ethereum's smart contract codes. Especially for various smart contract applications in Ethereum, Unita can seamlessly transplant them.

Multi-chain structure ensures security

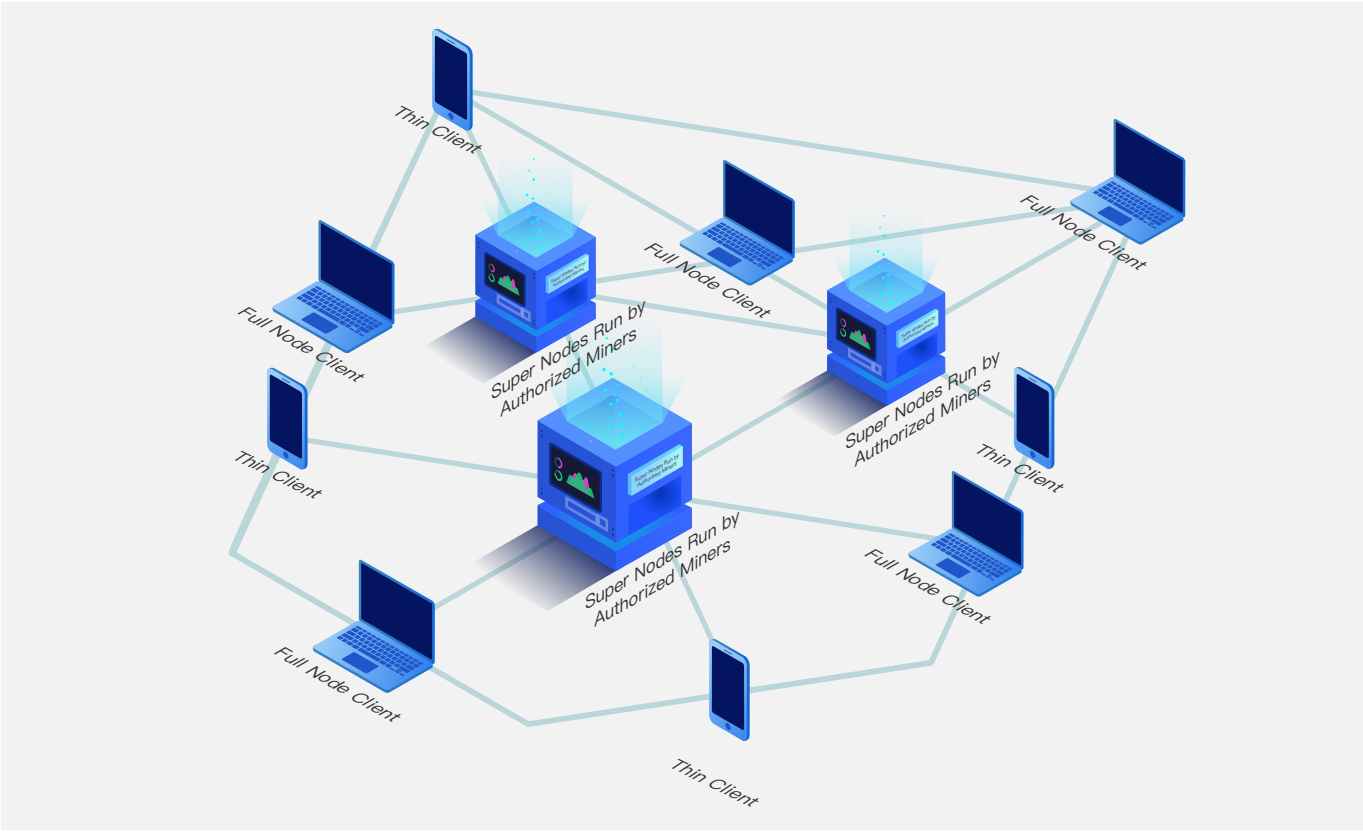
Large-scale enterprise applications involve complex data interactions. The data often needs to be segmented according to business requirements, in order to meet the needs of data isolation considered from business and security perspectives. The DApp (Decentralized Application) model in current public blockchain systems uses a single blockchain network to store and process data of all applications, which cannot meet the requirements of business applications. Unita provides a one-click blockchain tool that allows enterprises to quickly create their own blockchain network for their own applications. Operations of business logic and data storage are fully isolated from other enterprise applications, making them more secure and reliable. When interacting with other blockchains, whether it's a token transaction or a data interaction, you can use Unita's cross-chain technology.

Chapter 3
Unita Technical Modules

1. Consortium blockchain technology

1.1 System Introduction

Blockchains such as Bitcoin, Ethereum, and Qtum are called public blockchains, which are characterized by no access restrictions, and anyone can create blocks and send transactions on them. The public blockchain usually uses consensus algorithms suitable for specific scenarios, such as PoW (Proof of Work) and PoS (Proof of Stake), to ensure that a large number of users can reach a consensus on "who can create the next block." Public blockchains using these consensus algorithms are considered to be completely decentralized. The consortium blockchain is often referred to as "partially decentralized" or "weakly centralized." In a consortium blockchain, the process of consensus can only be performed by a small number of authorized nodes, which are called supernodes. The supernodes are responsible for packaging the information uploaded to the blockchain system into a new block, i.e. accounting authority, and the remaining ordinary nodes will have the right to read block information, initiate transactions, deploy and call contracts. The mode of consortium blockchain is closer to the scene of a business application and is convenient for enterprises to effectively manage the blockchain. The consortium of multiple enterprises ensures the security of the blockchain and effectively avoids the 51% attack and fork problems common in the PoW, PoS consensus algorithms.



Unita supports the UTXO transaction model, and is compatible with the Ethereum's virtual machine (EVM) to support development and deployment of smart contract. It innovatively adopts the SCAR consensus algorithm, which can dynamically adjust parameters according to the load of the blockchain network, and find a balance between high performance and low load time, thereby achieving performance scalability. The supernodes are authorized by the decentralized governance protocol (DGP) to make the storage and update of the supernodes more flexible and convenient. Unita also integrates a one-click blockchain module, allowing enterprises to customize blockchain system according to their own scenes, and to start their own blockchain network with one click.

This system architecture has many new advantages in meeting the needs of enterprises:

01 High TPS (Transaction Per Second) and short confirmation time, and the SCAR algorithm dynamically adjusts the performance of the blockchain according to the network load.

02 Customizable system parameters, ensuring that the system is suitable for a variety of different environments. Enterprise users can customize system parameters according to their own application scenarios by using a one-click blockchain.

03 The blockchain governance protocol clearly divides the read and write permissions of the blockchain, and the weakly centralized solution will be more suitable for business applications.

At the same time, Unita will combine the technical advantages of cross-chain trading, data management, decentralized storage, etc.. Through the inheritance of excellent features and the introduction and innovation of new technologies, the business blockchain will be applied to a variety of areas perfectly, and the enterprise ecosystem will be improved. Unita will provide a vision of serving an increasingly diverse society more efficiently.

1.2 Consensus Algorithm

Traditional blockchain consensus algorithms such as PoW (Proof of Work) and PoS (Proof of Stake) usually have a block interval of 10 seconds or more, in order to reduce forks and to keep the stability of the network. For example, the block interval of Ethereum is 15 seconds and Bitcoin is 10 minutes. Excessive block interval time leads to a longer waiting time for the user to confirm the transaction, which is not suitable for applications such as real-time payments.

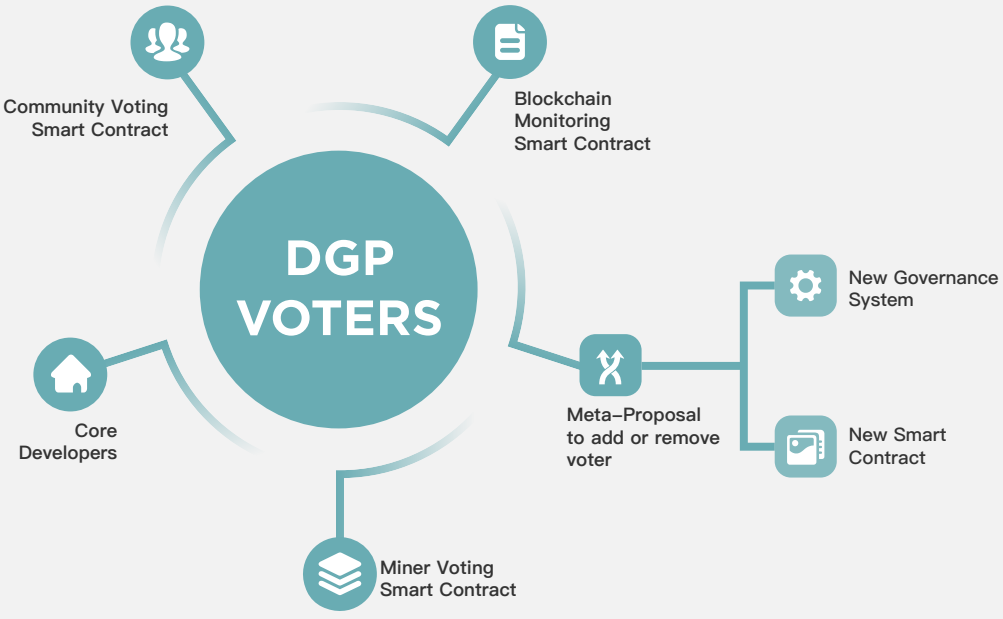
Some consortium blockchain consensus algorithms, such DPoS (Delegated Proof of Stake) of EOS and Aura (Authority Round) of Parity, selects supernodes by voting to execute the consensus algorithm, and the block interval can be reduced to a minimum of 1 second. But the problem with them is that the number of blocks is too large, which puts a lot of pressure on network bandwidth and data storage. Running a full node, or even a light node that only downloads the block header, has high requirements on the performance of the operating device.

For most business applications of the blockchain, such as credit tracking, commodity traceability, the write operation on the blockchain are usually periodic. That is, the transaction volume is great at specific time of each day and small during the rest time. In such a scenario, if high-speed block generation is always maintained, it is a huge waste of network and storage resources. In fact, it is only necessary to ensure that the system has high performance during peak hours of the network. Therefore, we propose the SCAR (Scalable Consensus Algorithm). SCAR's idea is to dynamically adjust parameters based on the load of the blockchain network, thus finding a balance between high performance and low load to achieve performance scalability. While ensuring the performance of the blockchain, the pressure on network bandwidth and data storage are reduced as much as possible, leading to greater advantages in large-scale business applications.

The SCAR algorithm realizes dynamically updating the block interval by the transaction volume on the consortium blockchain, thereby achieving the scalability of the blockchain performance. It should be noted that the core idea of the SCAR algorithm is to dynamically adjust the performance of the blockchain according to the load, but its implementation is not unique. We will continuously explore and optimize the implementation of SCAR, to bring a more economical and flexible service experience to enterprise users.

1.3 Chain Governance

It is well known that, since the emergence of the blockchain, main networks of various projects have been launched, but network forking has always affected the development of blockchain and blockchain applications. How to achieve a seam–less automatic upgrade of blockchain network and to reduce the possibility of fork and establish a more effective blockchain network governance model, is a huge challenge in the development of a blockchain. At the same time, the fork will also have a significant impact on the deployment of blockchain applications. Even mainstream projects can't escape the harm to communities and users caused by hard forks and soft forks. For example, to solve the problem of network congestion, some community members saw a fork of bitcoin as necessary for the continued growth of the network and formed bitcoin cash. In order to repair the DAO contract, Ethereum adopted a hard fork and finally forked into two chains ethereum and ethereum classic. They all cause a certain degree of damage to the decentralization of the blockchain and users' trust.



DGP (Decentralized Governance Protocol) proposes to manage the parameters of the blockchain network through smart contracts and implement a decentralized network autonomy mechanism to realize automatic upgrades and fast iterations of the blockchain network without worrying about the impact of a soft or hard fork on the network and the community. DGP specifies a modification protocol for a particular parameter by setting a specific governance smart contract, and the process is automated, without the user having to upgrade the wallet or synchronize to the latest ledger. In DGP, the governors are composed of participants in the ecosystem. Whether parameters will be modified is voted on by governors, and the smart contract itself is also under governance, which means that the DGP contract has the ability to self-manage and self-upgrade.

In the SCAR consensus, we use the DGP smart contract to implement the voting of the super-nodes, dynamically storing and updating the list of authorized miners. At the same time, specific DGP contracts are deployed for parameters of the consortium blockchain, so that it has powerful self-management and self-iteration performance, enhancing the autonomy and intelligence of enterprise services.

2. Cross-chain Exchange

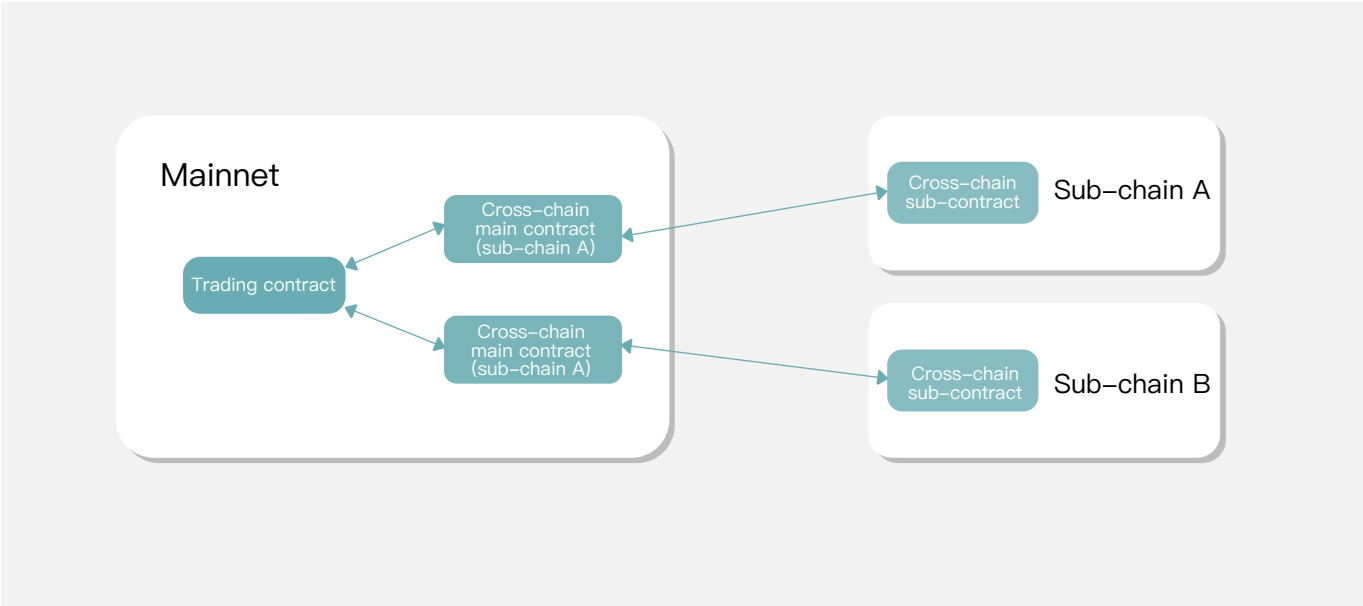
2.1 Related Background

Many cryptocurrencies have emerged with the development of the blockchain technology. These cryptocurrencies are recorded in their respective blockchain ledger, without communication with to other cryptocurrency networks. Therefore, trading of cryptocurrencies is mainly conducted by means of cryptocurrency exchanges. Most exchanges are based on centralized services which are often plagued by security and privacy risks. Nevertheless, decentralized exchanges running on blockchains are receiving more and more attention because of their data transparency, privacy protections, and real-time settlement.

Currently, most decentralized exchanges realize the trading of tokens on the same blockchain, rather than cross-chain trading. It limits application scenarios of the decentralized exchange. This paper proposes a decentralized cryptocurrency exchange solution that enables cross-chain cryp-tocurrency trading. Here we only describe its basic idea and the design and development are still in process.

We call this solution, Canal, because the canal realizes transportation and trading of goods among multiple cities. The original intention is that, after a user launches his own blockchain using the One service, he can use this solution to exchange his cryptocurrency with other blockchains, to facilitate cryptocurrency circulation.

2.2 System Introduction



The main chain uses a consortium blockchain. Supernodes of the consortium blockchain are voted through all users of the exchange. Supernodes are responsible for verifying all transactions on the blockchain and generating new blocks. The main chain connects to all side-chains that need to be traded, ensuring data can be transmitted among chains. Meanwhile, the main chain is responsible for running the required smart contracts. Details of this solution will be described below.

The cross-chain part adopts the Relay type, which consists of two contracts. One is deployed on the main chain called the main contract and the other is deployed on the side-chain called the sub-contract. The sub-contract is for users to deposit and withdraw tokens on the side-chain, as is similar to a centralized exchange. The main contract is used to synchronize users' transaction records and store their balances, just like the centralized exchange. The trading process uses an automatic pricing model built on a smart contract. When the contract is initialized, a certain amount of cryptocurrency A and B are needed as fund pools to realize trading between A and B. This part of fund achieve dynamic exchange and balance in the users' continuous trading process. The conversion rate between A and B depends on the amount of A and B in the pool, and it conforms to two principles. First, the less A in the fund pool, the higher the conversion rate from A to B. And it's the same for B. Second, any cryptocurrencies in the pool can not be used up, otherwise there will be unable to continue the conversion.

3. Data Management

3.1 Related Background

Data Management refers to the process of collecting, organizing, storing, processing, transmitting and retrieving different types of data. It is an important application area of the computer science. One of its goals is to efficiently store and manage complex, large amounts of data using computers, so that people can easily get access to the data. Another goal is to extract and derive valuable information from the data, and then use the information as a guidance for action and decision making.

At present, enterprises mainly use centralized databases and file systems for data management. Large Internet companies develop their own systems, such as GFS (Google File System), SQL Server, etc., and deploy local services. Small and medium-sized companies connect to cloud services such as AWS, Aliyun, and Google Cloud delegate data management tasks to these third parties. Local and cloud data services have their own application scenarios and they maintain the basic data of many companies.

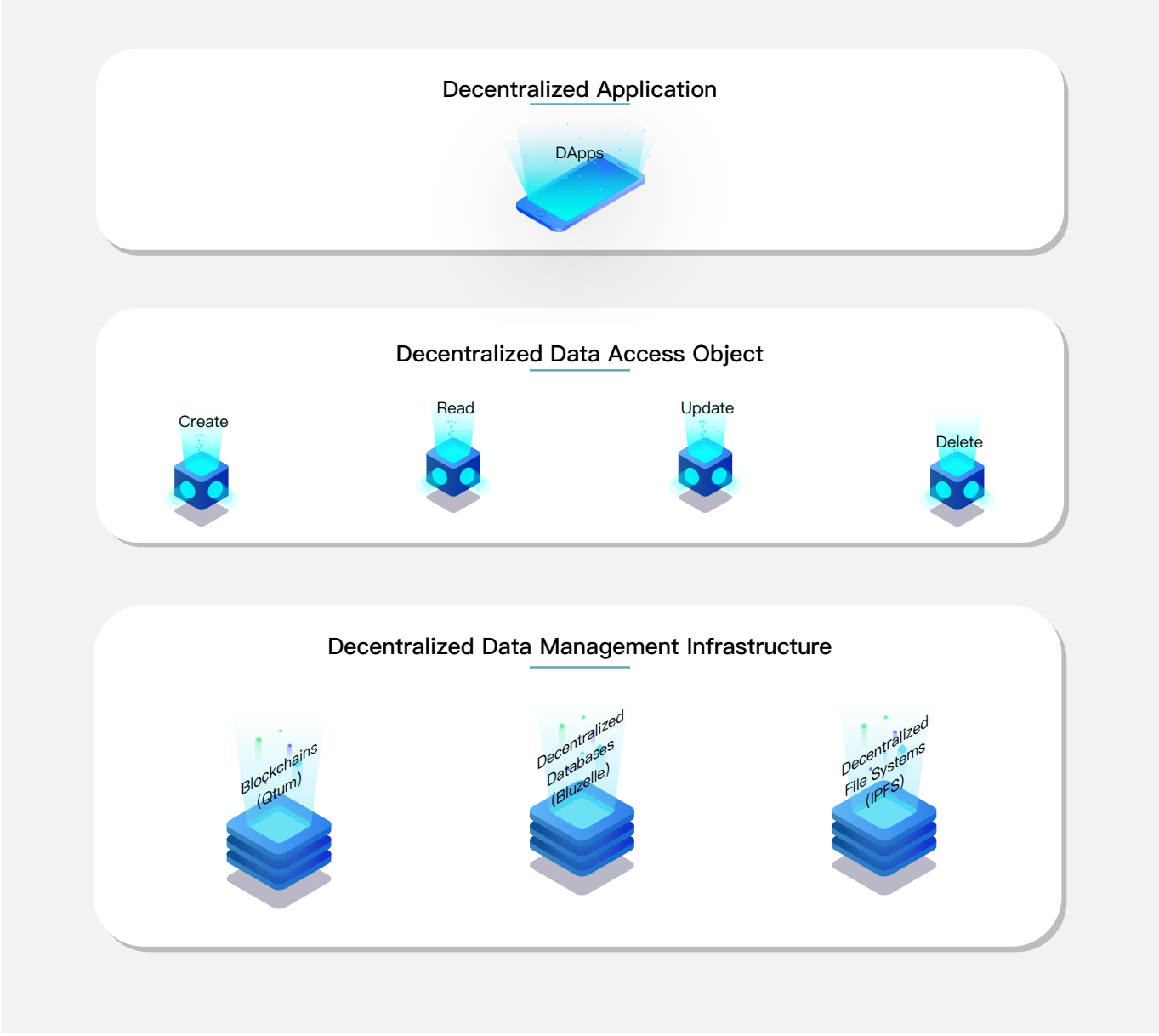
Centralized storage is currently the main solution to data management, but there are serious storage problems in centralized databases and file systems around the world. Enterprises often store all their data and files in centralized databases and file systems. But centralized storage solutions often attract attacks from hackers, or they may be ruined by an accident. Enterprises sometimes have to face the loss of all their data resources and never get them back. Some business highly relies on data and such kind of loss may lead to huge risks. Although cloud service providers would promise to do data backup, but it has not solved the fundamental problem.

Decentralization technologies, such as blockchain and IPFS, provide new types of solutions to data management. By using encryption and consensus, data privacy and security are guaranteed. Since data are stored in a lot of nodes, there is no need to worry about data loss caused by failure of one single node, which improves security and reliability. Encryption and segmentation technologies control the read access and guarantee data privacy. At the same time, in order to ensure scalability, cluster technology is used. A cluster is a large group of nodes that store and manage data together, and it allows new nodes to join or expanding more clusters.

However, at present, with the increasing number of decentralized systems, developers have to face high costs in selection, learning, development, deployment, and maintenance of these systems. Therefore we proposed the DDAO (Decentralized Data Access Object). Our goal is to develop a common library to access various decentralized systems with uniform interfaces, so as to perform CRUD (Create, Read, Update, Delete) operations. Through this library, developers can quickly read and write data in various decentralized systems and build their own applications without having to care about the underlying technology.

3.2 System Introduction

Decentralized systems have a variety of implementations, leading to high learning costs for developers. This article will design a common library for connecting upper-layer DApp applications to lower-layer decentralized systems, enabling CRUD operations for multiple decentralized systems. Developers can quickly build their own data management applications through this library without having knowledge about the underlying technology. At the same time, based on this library, a cloud service can be built to provide online CRUD interfaces of multiple decentralized systems, eliminating the cost of deploying and maintaining decentralized systems for developers.



The system can be separated into three layers, namely DDMI (Decentralized Data Management Infrastructure), DDAO and DApp (Decentralized Application), which will be introduced as follows.

DDMI (Decentralized Data Management Infrastructure)

The DDMI layer contains a variety of decentralized systems, including blockchains, decentralized databases, decentralized file systems, and more. These decentralized systems can be launched locally by the developer or deployed on a remote server, and then connected through a descriptor with a uniform format.

DDAO (Decentralized Data Access Object)

The DDAO layer is the core module proposed in this paper. Its main functions include (1) establishing connections to various decentralized systems, (2) abstracting to get compatible CRUD interfaces. For different types of decentralized systems, abstract interfaces are different:

01 For blockchain systems, interfaces contain sending transactions, querying transactions, creating contracts, reading and writing contracts.

02 For decentralized database systems, database interfaces such as create, find, insert, and update are included.

03 For decentralized file systems, main interfaces such as file upload, download, and encryption are included.

The design here needs to take into account the compatibility of different systems, so only some common functions are abstracted. At the same time, the interface used to send original commands is offered, so that developers can request some unique interfaces of each system.

DApp (Decentralized Application)

The DApp can be JavaScript scripts running on a browser or programs running on a server. They may also be stored in the decentralized file system and later obtained through a specific address as an entry. The DApp initiates the DDAO instance, connects local or cloud decentralized systems, and performs CRUD operations on these systems, so as to realize data management applications. Multiple DDAO instances can be initiated within one DApp, in order to connect to multiple different decentralized systems. This allows data interaction with multiple decentralized systems in one application, enabling more features compared with traditional smart contract–based DApps. For example, cross–chain data transmission among multiple blockchains, or data visualization based on blockchain and file system.

Chapter 4
Unita Enterprise Services

1. One-click Blockchain

For most enterprises, they tend to build their own blockchain network to establish their distributed ledger or smart contract system, rather than create application services based on a public blockchain. However, blockchain technology is quite difficult for most enterprises, or the cost of time and labor for development is too high. Therefore we provide a one-click blockchain service. With this service, companies only need to configure several blockchain parameters according to their application scenarios to customize their own blockchain. In customized blockchains, the consensus mechanism is the newly proposed SCAR, and the on-chain governance method uses DGP technology.

Based on the Unita's one-click blockchain service to develop blockchain applications will bring the following benefits to enterprise:

01 Blockchain parameters can be customized, including block interval, confirmation time, etc.;

02 The consortium blockchain saves bandwidth and hard disk consumption, and additionally, electricity cost is saved since there is no mining;

03 Enterprises can flexibly and efficiently publish their own blockchain, building customized blockchain services;

04 Blockchains launched by the enterprise can be completely independent of each other, whereas the cross-chain technology can also help to maintain the interaction between the main chain and other chains.

2. Development Platform

Unita provides a rich set of development tools, application templates, and decentralized solutions, helping enterprises develop and implement various DApps. Compared to other development platforms, Unita pays more attention to completely implementing the underlying common functions, to help enterprises quickly develop upper-layer applications and avoid recreating wheels. Meanwhile, we will establish some upper-layer development specifications, making upper-layer codes more standard and improving readability as well as versatility.

Using Unita for DApp development has the following advantages:

Development Tools

Unita contains compilation, deployment and debugging tools for the smart contract, as well as application tools such as blockchain explorers and wallets. It has a complete toolchain covering from development to online usage, greatly improving efficiency of developers.

Application Templates

Unita provides common smart contract templates such as those for security tokens, non-fungible tokens, blockchain games, and more. Besides, in the direction of data management, Unita will develop templates for data storage, interaction, and visualization. Based on these templates, enterprises can quickly develop and implement some common applications, and we will also add new templates according to enterprise requirements.

Technical Solutions

For data management, file storage, cross chain, decentralized exchange and other technologies, modular implementations are provided for enterprises. In this way, enterprises can apply Unita to various business scenarios without worry about lack of technical implementation.

3. Storing Data on Blockchain

Based on Unita's data management technology module, enterprises can store their own data and files in a decentralized way, for information release and data transferring usage. Unita contains various data management solutions, including on-chain storage, decentralized database, and decentralized file system, in order to meet the storage needs of various enterprise data. Enterprises can use a common library provided by Unita to read and write data without caring about the underlying implementation.

Using Unita to store enterprise data on the blockchain will bring about the following applications:

Data Release

Through Unita, enterprises can open their data to the public, and use features of the decentralization system to ensure authenticity and credibility of the data.

Data Flow

Unita can be effectively used for data transmission within an enterprise or among enterprises. Features of the blockchain ensure the data transmission process cannot be tampered with, as can be perfectly applied to finance and anti-counterfeiting.

Data Traceability

Through recording the goods information, like production and transportation, on the decentralized system, enterprises can trace the origin of goods based on Unita, helping users understand the products in all aspects.

Chapter 5
Application Scenario

Unita is committed to exploring the potential of blockchain technology to solve business problems. Unita aims to improve the efficiency of operations, reduce the costs of cooperation, and make the distribution of these technological advancements more balanced. We have corresponding modules and customized solutions tailored to various business needs, enabling enterprises to enjoy highly-efficient blockchain solutions at a low cost.

The following is a list of typical blockchain application scenarios in various industries with high potential for rewards from blockchain technology. They include industries such as insurance, supply chain businesses, public welfare, health care, and business alliances.

1. Financial Insurance

1.1 Application Scenario

Cross-border Payments

The scale of cross-border trade has continued to grow with globalization. However, cross-border payment solutions such as the SWIFT (Society for Worldwide Interbank Financial Telecommunication) model face high intermediary costs, low payment efficiency, long confirmation times, little security, among other issues.

Through blockchain technology, a set of standard agreements on a distributed ledger for financial transactions can be established among multilateral business parties. Cross-border P2P financial transactions between banks, enterprises, and individuals can be realized through weak centralization of the ledger. These ledgers can achieve higher efficiency, lower costs, and safer payment performance than current solutions.

Transaction Settlement

Interbank transaction settlements currently face a series of debilitating problems. These include the issues of low-efficiency solutions at a high cost or inconsistent agreements due to the involvement of multi-party agreements and disparate accounting systems. Through the joint construction and maintenance of one trusted and mutual recognized shared public ledger, the transaction information and settlement records will be clear, significantly reducing the costs of business for both parties.

Insurance Claims

Due to information asymmetry, the insurance industry faces problems including inaccurate claims, fraudulent claims, and a general lack of mutual trust between clients and customers. Due to the requirements of customer identity verification and review process for claims settlements, the industry currently faces high labor and overhead costs.

Through data traceability, tamper-resistance and other characteristics, blockchain technology will ensure the accuracy of the full chain of insurance data. With the combination of smart contract technology, claims will be fast and automatic, which can effectively improve customer satisfaction.

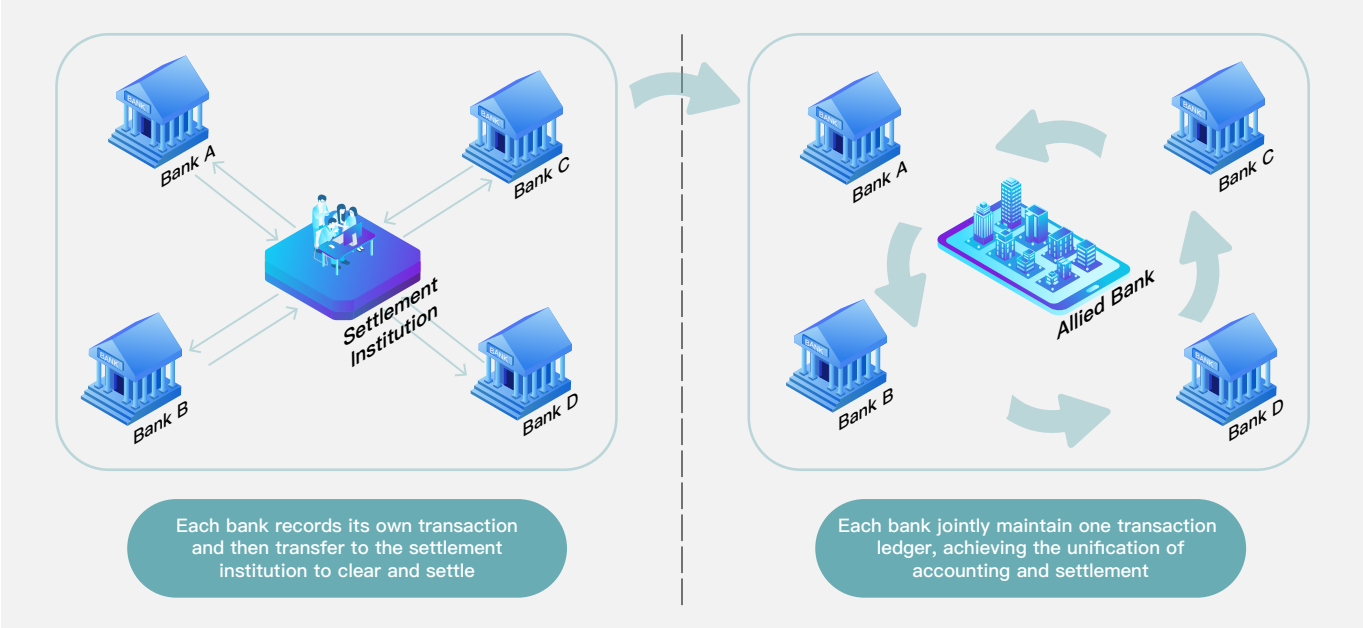
Credit Information

At present, the financial credit industry mainly faces the issues of information isolation, high collection cost, and insufficient privacy protections. Through decentralization, asymmetric encryption, and smart contract management of the blockchain, credit data can be encrypted and distributed. Further, data sharing trading platforms can be set up. Finally, the user will be able to control the sovereignty of his data through a private key or through selective authorization by the company. At the same time, users can also benefit from the circulation of credit data as a digital asset.

1.2 Application Case: Transaction Settlement

The financial industry maintains the operation of the entire credit economy through centralized institutions such as central banks, commercial banks, and various regulatory agencies. The business processes are complex and inefficient, with high labor costs and material requirements. In contrast, blockchain's key characteristics are tamper-resistance, security, transparency, and decentralization.

In addition to the many advantages shared by blockchain, Unita, based on a consortium blockchain, has high TPS, customizable parameters, PoT consensus mechanism and other features which can effectively support traditional transnational remittances and interbank clearing in various business scenarios.



As demonstrated in the figure above, the traditional interbank settlement business often needs to be accounted for and verified by multiple institutions such as the user's bank, central bank, correspondent bank, and clearing bank. Each institution has its own accounting system. These disparate systems lead to the problems of slow ledger processing, low liquidation efficiency, and high liquidation costs. What's more, it may also cause inconsistencies in multi-party transactions, which even affect the efficiency of settlements.

Rather, through the consortium blockchain, related businesses and the bank settlements could establish a distributed shared ledger. All transactions between the business banks are written, confirmed and recorded in this ledger so that every transaction can be liquidated, and all the account data is in banks is open and transparent, and tamper resistant. Thus, the ledger can help banks effectively solve problems such as slow settlement, high cost, and a large number of bank documents and long processing lead times.

2. Supply Chain

2.1 Application Scenario

Product Traceability

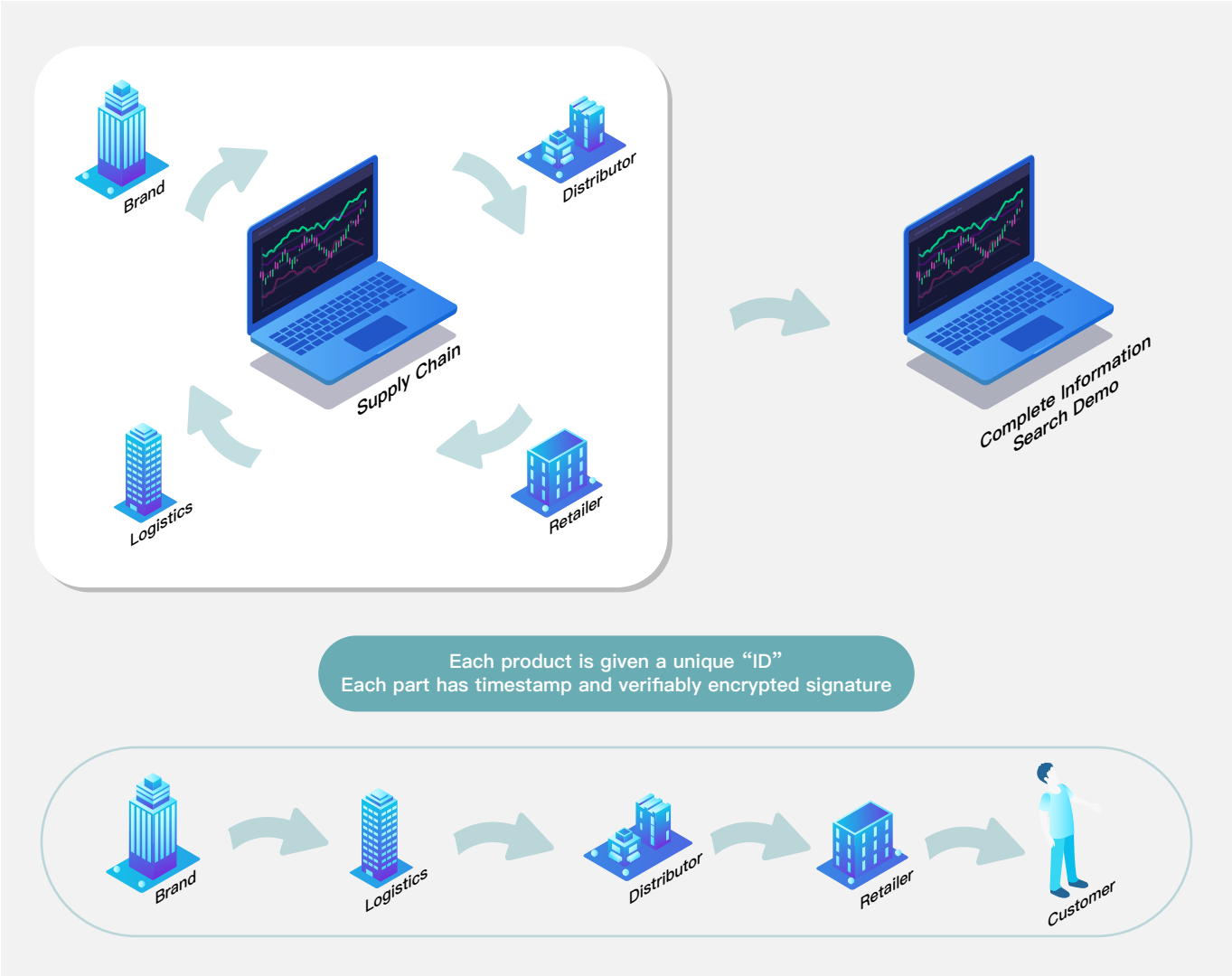
In the process of supply chain logistics, there are many aspects from production to sales, and each has the possibility of incorporating in fake or inferior goods. Using the block-chain technology can give each product a unique "ID." In combination with technologies such as the IoT and anti-counterfeiting labels, goods provenance can be tracked from raw materials, production, packaging, distribution, sales, and post-sale making the entire process transparent.

Supply Chain Finance

In the real economy, minor companies are generally faced with difficulties in financing and high financing costs, partly attributed to the limited assessments of banks on small companies' business development, repayment ability, and the doubts on the authenticity of their data. Supply chain companies and banks can jointly maintain a set of credible consensus ledgers, which records all kinds of order and capital goods transactions between upstream and downstream companies to ensure the openness and transparency of data, which can significantly reduce bank risk assessments and control costs. In addition, companies can obtain credit services and improve the efficiency of business operations.

2.2 Application Case: Traceability of goods

Supply chains are complex systems consisting of multiple entities such as suppliers, manufacturers, transporters, retailers, and customers. It covers the integration of goods, capital, information, and data flows. The business transactions interacting in time and space between various entities are numerous and sophisticated with the characters of low transparency, poor information and the high cost of trust, which affects the overall efficiency of the supply chain and possible systemic risks. Block-chain technology has excellent potential in the supply chain field, especially in the area of com-modity anti-counterfeiting traceability, because of its advantages of openness and transparency, complete time stamping, and tamper-resistant information.



As the figure above, the traceability of luxury goods is an example. In the supply chain, there are brands, distributors, logistics parties, dealers, retailers, regulators, and other companies and organizations. Through Unita corporation services, upstream and downstream companies in the supply chain can jointly build an open and transparent luxury circulation database. Based on electronic anti-counterfeiting labels, logistics tracking, customs inspection, and other data, each product is given a unique "ID." Adding timestamps of each link and digital signature, trusted nodes can record in real time with the update of the supply chain logistics information of the entire links. Then a traceable shared data ledger that the source origin, sales direction, and responsibility can be traced is constructed. Finally, the traceability and anti-counterfeiting of the goods can be realized, and consumers can also inquire about the source information of the products anytime and anywhere.

3. Government Affairs

3.1 Application Scenario

Public Service

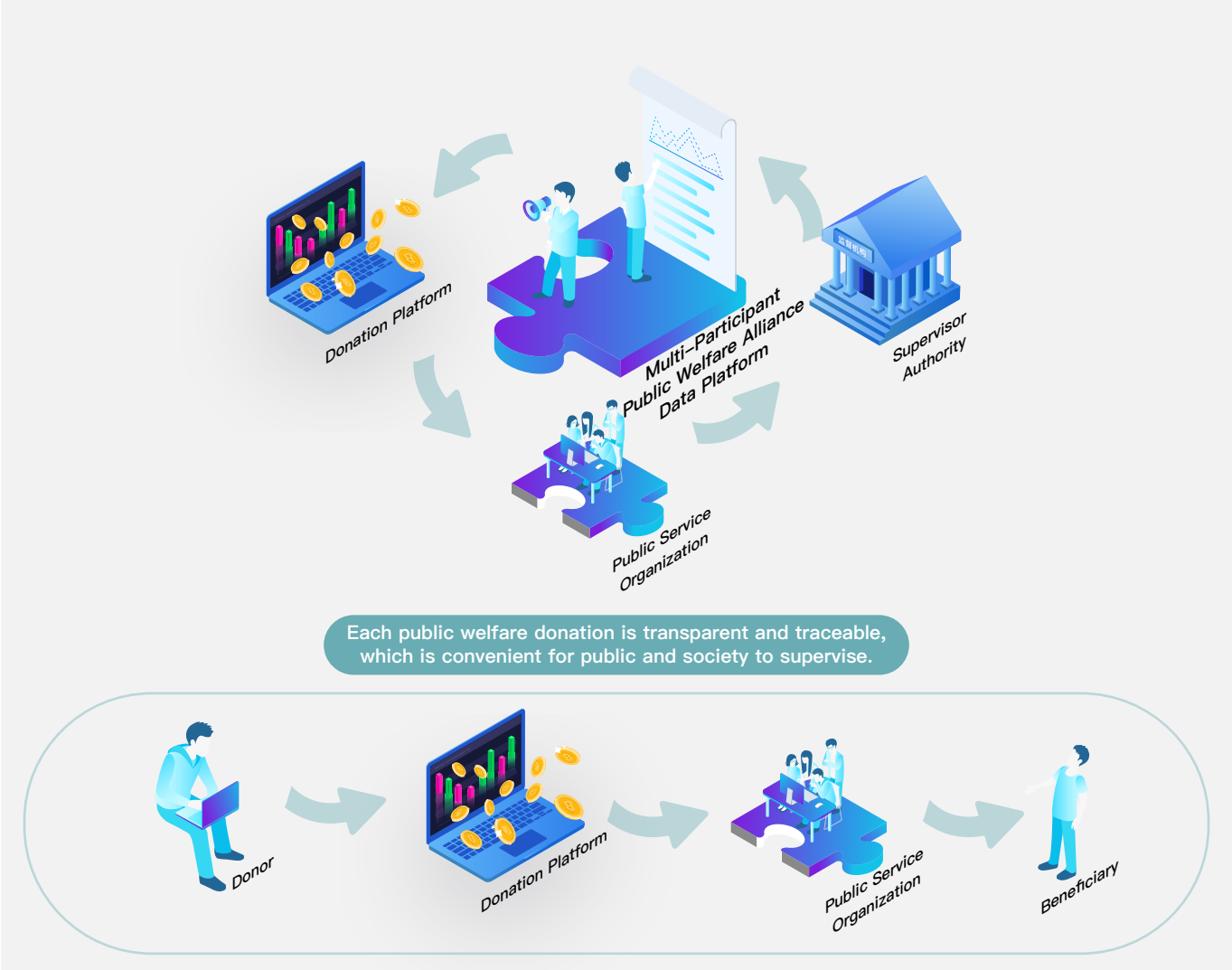
Administrative work is more inclined to set industry standards and conduct effective supervision and management. However, there are widespread issues such as long regula–tory process and distortion of records. Due to the transparent and tamper–resistant nature of blockchain technology, government regulatory agencies and third parties public service agencies can build a public account ledger of government service information through the consortium blockchain, realizing information disclosure, real–time monitoring and management of the whole process greatly improves the supervision of public services and their execution efficiency.

Public Welfare Programs

Throughout recent times, public welfare programs and charities have faced scandals involving the misuse of funds, and the overall industry confronts a massive amount of distrust. Through blockchain technology, transparency and traceability of charitable donations can be realized. Each participant works together to maintain a public ledger of charitable donations and public funds, which greatly enhances the authority and trust of public welfare platforms.

3.2 Application Case: Public Welfare Donation

With the continuous development of people's economic level, per capita disposable income rises, and public welfare donation is more closely stepping into people's lives. At present, there are many trust problems in this industry that are criticized by many caring people. Blockchain technology is called “trust machine”, which is naturally applicable to public welfare donation scenario. No matter the funding details in public welfare processes, donation projects, donation flows or the follow-up report and the core capital flow of the helper can be completely stored in the distributed account ledger based on the blockchain. Under the premise of the relevant funding laws and regulations and the approach and supervision to the public, therefore we can establish the most credible charity circle.



As shown in the figure above, the public service organizations, donation platforms, regulatory agencies and other parties jointly create and maintain a public welfare alliance data ledger through blockchain technology so that donors can ensure each transfer of the donation item is eventually distributed to the recipient's specific account by recording and tracking the flow of donation funds through the ledger. The public welfare alliance data ledger solves the problem of lack of credibility such as information asymmetry of public service organizations and the public, so that each public welfare donation is transparent and traceable, and becomes a real public welfare under the supervision of the public and society.

4. Medical

4.1 Application Scenario

Electronic Medical Records

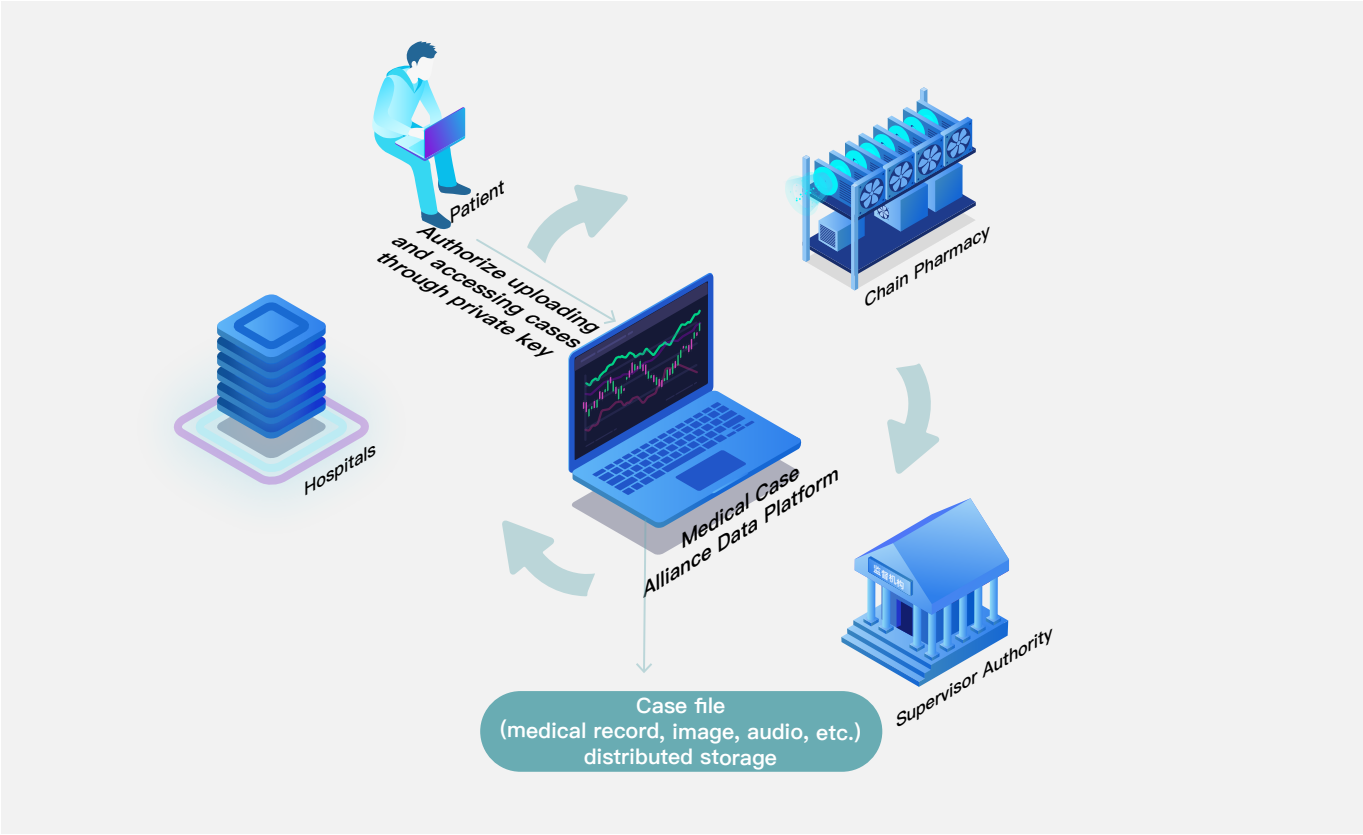
The medical record is a record of the medical staff's medical activity process such as patient examination, diagnosis, treatment, etc. It is also a personal medical health record of the patient, which plays an important role in medical treatment, prevention, teaching, scientific research, hospital management, etc. However, there are current issues such as irregular records, inconsistent formats, and non-sharing of data. Through blockchain technology, major hospitals and regulatory agencies can establish a distributed electronic medical record sharing database to realize decentralized recording and storage of medical record data, so that patients can achieve root-seeking and standard storage for their medical records management. It can also make medical records under privacy protection as a public medical record database to provide powerful help and reference for doctor diagnosis.

Electronic Prescriptions

Electronic prescriptions have the advantages of simplifying the treatment process, improving information accuracy, and drug management efficiency. However, there are still problems such as the abuse of electronic prescriptions, data tampering, and inadequate patient privacy protection. Therefore, pharmaceutical companies and medical insurance departments can jointly record and maintain an electronic prescription sharing database through blockchain technology. From the prescription to the patient's full process of data record and traceability, the database can effectively solve the above problems. Under the premise of personal authorization, electronic medical records and prescriptions can be used for privacy protection and data authorization, which can help doctors quickly and accurately diagnose the disease and issue drugs.

4.2 Application Case: Electronic Medical Record

The electronic medical record data of Chinese patients are mainly recorded and maintained by hospitals. Every time they visit the new hospital, they need to re-enter all the medical records. The hospital also has problems such as data loss and data inaccuracy in the preservation of historical medical records. Whether the patient itself has insufficient understanding of his past medical history or the lack of medical diagnosis from the medical institution, it is a practical solution to realize medical information data sharing and distributed encrypted storage through blockchain technology.



As shown in the figure above, different levels of hospitals, pharmacies, health planning committees (regulators) and other participants unite to create and maintain the same medical alliance public medical record database based on the consortium blockchain. The patient's identity information, medical history, diagnostic medical records, and other data are stored in the blockchain through the cryptographic algorithm. Then the patient is authorized to use the hospital through the private key, so as to ensure the accuracy and integrity of the medical data, and at the same time protect the patient's privacy from being violated.

5. Business Ecology

5.1 Application Scenario

Point Pass System

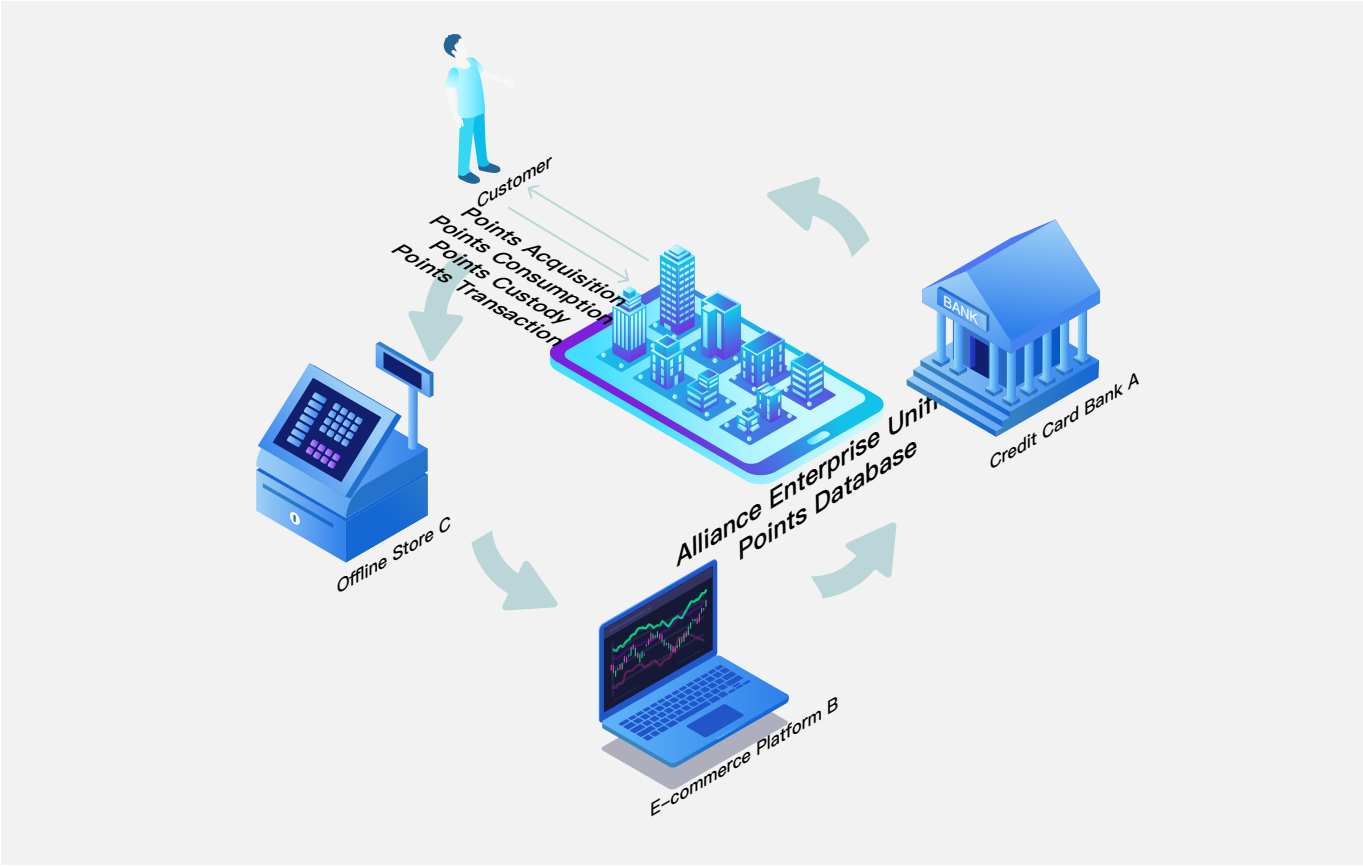
In the case of consumer-facing commercial organizations, the member points systems have always been a relatively effective means of user acquisition and retention. However, the points system also faces issues such as poor liquidity of the company's points, low use value and insufficient user interest. The issuance of points pass through blockchain technology has the advantages of open and transparent rules, relatively constant total amounts of points, and a strong expansion of circulation scenarios. It can also effectively eliminate data tampering in transactions, avoid internal cheating risks, and promote more mutually beneficial interactions between business organizations and consumers.

Merchant Alliance

Nowadays, business ecosystems are becoming increasingly diverse. Business operations require many partnerships. These partnerships give rise to complicated data interactions, high costs of blockchain technology promotes transparency, traceability, and tamper-resistance, so those cooperative merchants can build a shared distributed database that caters to various distributed databases based on the consortium blockchain. The data of the cooperative business can upload to the blockchain on demand to access a log of interactions and settlements, which can reduce trust costs, enhance cooperative agreements, and reshape the business cooperation ecosystem. These solutions hold the most potential for industries that require the development of many partnerships like advertising and supply chain enterprises.

5.2 Application Case: Point Pass System

user loyalty. It is especially important for e-commerce platforms, online communities, airline hotels, shopping malls, and supermarkets. At present, enterprises primarily build their own closed ecosystem points systems. Users can only acquire and consume points within these closed systems. The application of scenarios and conditions are very limited. Blockchain can help to facilitate a point pass system between enterprises within the same industry or with symbiotic relationships. This alliance can share transparent publishing rules, constant total (or limited controllable) number of points, and wider circulation. To pursue the common interests of the enterprise alliance, the alliance points pass can effectively stimulate the daily consumption of users in the ecology, accelerate the acquisition and consumption of the points pass, and greatly enhance the commercial vitality of the industry as a whole.



In the scenario shown in the figure above, credit card bank A, e-commerce platform B and offline store C are based on the consortium blockchain enterprise service. They share the goal of building a unified enterprise database. Consumers can acquire points after completing the transactions under the rules in the specific scenarios of the three commercial entities. In addition, the points can be consumed and transferred across the commercial body in the specified scene.

The rules for the issuance, acquisition, and consumption of all points are open and transparent. As a consensus node, the alliance enterprise is responsible for rule setting, transaction accounting, and points circulation. The points pass alliance has the following unique advantages:

01 The rules for the issuance, acquisition, and consumption of points are transparent and open. Every party in the alliance enterprise are equal. Compared with traditional points, these alliances have stronger credibility and lower potential for moral hazard.

02 All points are related to trading and operation information. The alliance companies jointly maintain the public ledger. The transaction data has traceable and tamper–resistant characteristics, which effectively reduces the costs of cooperation.

03 The expansion of the use of points allows users to freely make choices in regards to their consumption, significantly improving the use and circulation value of the points. Users perception of the utility of these points increases drastically.

04 Alliance companies can share relevant user groups through the distribution and circulation of points. Further business scenarios and lines are opened up, leading to a growth in overall points circulation and usage.

Alliance companies can gradually enrich the points acquisition and usage scenarios according to their own businesses, and achieve various goals. They can revitalize their own business, stimulate performance growth, and produce multilateral win–win results.

Chapter 6
Global Trustworthy Value Network

In Bitcoin: A Peer-to-Peer Electronic Cash System, Satoshi Nakamoto explored how peer-to-peer e-cash can realize decentralized value networks. The underlying blockchain technology uses decentralized networks, asymmetric key algorithms, and related consensus incentive mechanisms to solve the last piece of the Internet puzzle — the issue of trust.

Unita relies on blockchain technology and combines its innovative advantages to empower businesses and build a trustworthy global value network.

1. The Future of Global Intellectual Collaboration

The business community, academia, and government research institutions have taken an active role in exploring how to reduce industry trust costs and build distributed value networks.

The continuous improvement and development in the 'transformative technology' of blockchain will drive economic growth and changes in the industrial landscape. This will also be one of the important opportunities for developing countries to achieve leapfrog development and transform international labor systems.

The blockchain network promotes global intellectual collaborations, providing everyone with the opportunity to reallocate benefits through unique incentive mechanisms. A decentralized approach to collaboration maintains mutual trust in this vast network. The blockchain technology service provided by Unita enables commercial supply and demand sides to reduce transaction costs and maximize profits.

At the same time, replacing the third-party intermediaries with blockchain framework will provide key benefits:
(1)Increased reliability: After the data is chained through the blockchain, enterprises can place data in a distributed storage system where the data protection is prioritized
(2)Better security: Because data is cryptographically stored in distributed network nodes, the risks of data leakage and hacking are greatly reduced.

2. The Future of Unita – Efficient Empowerment Tools in Enterprise

The future of Unita is a trust network that efficiently supports business empowerment, improves relationships in production supplies, and reshapes the transfer of value.

The blockchain technology provided by Unita will demonstrate a model distributed ledger system in the financial, supply chain, medical, and Internet of Things (IoT) industries. Unita's technical principles and mechanisms will transform traditional business to become more efficient and credible distributed ledgers. Unita facilitates the issuance of corporate points systems and the creation of customized smart contracts that indirectly enhance the productiveness of relationships in industry verti-cals.

The implementation of Unita blockchain technology can achieve more than one thousand transactions per second in the financial payment scenario, far exceeding the transaction speed of other digital currencies such as Bitcoin. Combined with the existing technical features, Unita will automatically adapt to the unique needs of each enterprise business scenario, and select the appropriate block size and transaction speed through a truly flexible blockchain algorithm to help establish the trust between different node types and optimize the scalability and performance of the network.

In addition, Unita can dynamically join any of the licensed companies in the peer node to achieve dynamic growth in any business alliance. At the same time, the one-click chain technology can help all industries retain independent control of the technology, thus fully supporting great applications of the enterprise blockchain technology, assisting the successful transformation of the company and reduce friction in intra-business operations.

3. Global Decentralized Value Network Construction

Unita employs its technological advantages to achieve the scalability, isolation, and interoperability of blockchain services under a multi-chain architecture, which will improve the mutual trust and operational efficiency of various business scenarios. Unita will also use the blockchain technology as the cornerstone to create a blueprint for the business value of the social trust system, and ultimately build a decentralized and global value network.