DSChain WhitePaper

Artificial Intelligence + Internet of Things Project Based on Blockchain Technology

Deep Chain Foundation

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Mission and Vsion

The Internet of Things can improve the efficiency of the use of resources and save people's time. With the development of information technology, low-cost information equipment has entered millions of households, and the number of devices connected to the Internet has increased as a geometric base. According to IBM, the number of connected devices in 2020 is expected to exceed 25 billion units. In 2009, it was 2.5 billion units, and now it is 10 billion units. Current IoT solutions are very expensive, because the infrastructure and maintenance costs of centralized cloud servers, large servers, and network devices are very high. When the number of IoT devices increases to tens of billions, there will be a lot of Communication information, which will greatly increase costs. Security, efficiency, business models and other issues have also adversely affected the development prospects of the Internet of Things.

[Mission]: The deep physical chain is a decentralized big data platform that uses the blockchain technology combined with the Internet of Things to intelligently analyze users and businesses. Deep-linking chain combines advanced blockchain technology with the Internet of Things and artificial intelligence to make full use of the characteristics of blockchain decentralization, transparency, irreversibility, and smart contracts. It is established in the world to be permanent and effective and continuously updated. The IoT data center solves the problem of decentralized trust between all applications or projects based on the Internet of Things on a global scale, and uses traceability to connect all items in the Internet of Things to each other in series, and utilizes blockchain technology in circumstances that cannot be tampered with. Demonstrate true traceability. After upgrading the public chain in the future, big data can be provided to the collaborating sidechain parties after cashing out the value of token payment to

achieve a precise and efficient cooperation model, and finally achieve a global IoT ecosystem supported by a blockchain technology.

[Vision]:

1. Let the global IoT smart devices work in a safe, efficient, and transparent network environment, so that people can enjoy the convenience brought by the Internet of Things.

2. Development of Token for the creation and transaction settlement of side chains (food chain, traffic chain, manufacturing chain, etc.) of deep-chain chain and subsequent development, rewarding individuals and organizations that contribute to the deep-chain chain. More institutions and businesses have access to the deep physical chain, with the continuous development of the deep chain ecosystem.

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First. Worldwide understanding of the Internet of Things and its current status

One. Major historical events during the evolution of the concept of the Internet of Things

The Internet of Things is also known as the sensor network in the world. This is another wave of information industry following the computer, the Internet, and the mobile communication network. Everything in the world is as small as a watch or a key, or as large as a car or a building. As long as it embeds a miniature sensor chip and intelligentizes it, the object can "talk automatically". With wireless network technology, people can "talk" with objects and "exchange" between objects and objects. This is the Internet of Things. The Internet of Things, also called sensor network, refers to a huge network formed by combining various information sensing devices with the Internet.

The Internet of Things has two meanings: First, the core and foundation of the Internet of Things is still the Internet, which is an extension and expansion network based on the Internet. Second, the user's end extends and expands to any object and item. Information exchange and communication, that is, things and things. The IoT is widely used in the convergence of networks through intelligent sensing, recognition technology, and pervasive computing and other communication-aware technologies. It is therefore also known as the third wave of the development of the world's information industry following the computer and the Internet. The Internet of Things is an application extension of the Internet. It is not so much the Internet of Things as a network. It is better

to say that the Internet of Things is a business and an application. Therefore, application innovation is the core of the development of the Internet of Things. Innovation 2.0 with user experience as the core is the soul of the development of the Internet of Things.

The history of the Internet of Things dates back to 1999. The important historical events in the development process are as follows：

- Professor Kevin Ash-ton of the Massachusetts Institute of Technology (MIT) in 1999 presented the concept of the Internet of Things for the first time.
- In 1999, the Massachusetts Institute of Technology established the "Auto-ID" and proposed that "all things can be interconnected via the Internet" to clarify the basic meaning of the Internet of Things. The early Internet of Things was a logistics network based on Radio Frequency Identification (RFID) technology. With the development of technology and applications, the content of the Internet of Things has undergone major changes.
- In 2003, U.S. "Technical Review" proposed that sensor network technology will be the top ten technologies that will change people's lives in the future.
- In 2004, the Japanese Ministry of General Affairs (MIC) put forward the u-Japan plan. This strategy seeks to achieve the connection between people, things and things, and people and things. It hopes to build Japan into a place where anyone, anybody, anyone can Connected ubiquitous network society.
- On November 17, 2005, at the World Summit on the Information Society (WSIS) held in Tunisia, the International Telecommunication Union (ITU) published the "ITU Internet Report 2005: The Internet of Things," citing the concept of the "Internet of

Things." The definition and scope of the Internet of Things have changed and the coverage has been greatly expanded. It no longer refers to the Internet of Things based on RFID technology.

- In 2006, South Korea established the u-Korea plan, which aims to establish a ubiquitous society and build smart networks (such as IPv6, BcN, and USN) and various new applications (such as DMB) in the people's living environment. Telematics, RFID) allows people to enjoy smart technology services anywhere, anytime.
- After 2008, in order to promote the development of science and technology and seek new economic growth points, governments of various countries began to pay attention to the next generation of technology planning and have focused on the Internet of Things.
- In 2009, the European Commission issued the European Internet of Things Action Plan, which described the application prospects of the Internet of Things technology and proposed that the EU government should strengthen the management of the Internet of Things and promote the development of the Internet of Things.
- In 2009, the United States listed new energy and internet of things as the two major priorities for revitalizing the economy. In the same year, the Internet of Things was formally listed as one of China's five emerging strategic industries. It was included in the "Government Work Report," and the Internet of Things has received great attention from the entire society in China.
- In 2011, IPV6 was formally launched and provided an important network resource for the development of the Internet of Things.

- In 2013, Google released Google Glasses.
- In 2016, the NB-IoT (Narrow Band Internet of Things) agreement was frozen, and global operators have standardized IoT-specific protocols.
- In 2017, the concept of unmanned cars and the sharing economy swept across the world, and the application of IoT further developed.

Since 2009, the United States, the European Union, and China have proposed the Internet of Things development policy. Today, the Internet of Things has experienced rapid development. Traditional enterprises and IT giants have laid out Internet of Things (IoT), and the Internet of Things (IoT) has accelerated penetration in many areas such as manufacturing, retail, service, and public utilities. The Internet of Things is now on the eve of large-scale explosive growth. According to the data released in 2016 by the IOT China Global IoT Market Size and Industry Trends, the global IoT market reached US$62.4 billion in 2015, a year-on-year increase of 29%. By 2018, the global IoT device market is expected to reach US$103.6 billion. The compound growth rate will reach 21% from 2013 to 2018. The number of new IoT devices accessed in 2019 will increase from 1.691 billion units in 2015 to 30.54. Billion Taiwan (Figure 1-1).

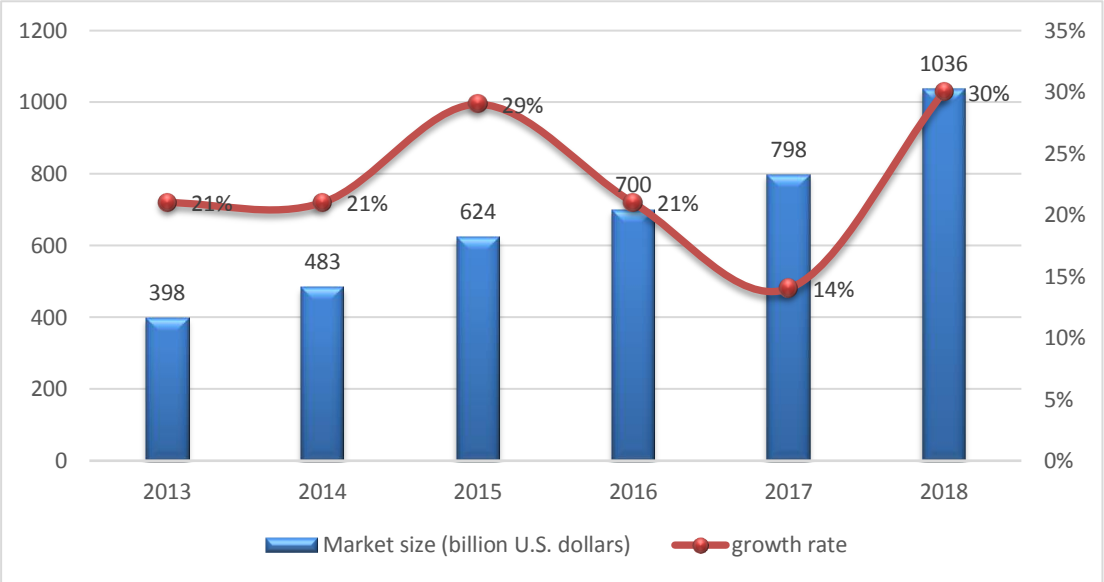

Figure 1-1: The scale and growth of the global IoT market from 2013 to 2018

At the same time, more and more items and devices are being connected to the Internet of Things. According to data released by IDC and Zhiyan Consulting, the number of IoT devices has reached 4.9 billion, and this number will increase by 30% in 2016. By the end of the year, the cumulative number of IoT devices worldwide will reach 6.392 billion. By 2020, The number of IoT devices used worldwide will grow to 20.8 billion. It is estimated that by the year 2018, the number of IoT devices will exceed the total of PC, tablet and smart phone stocks.

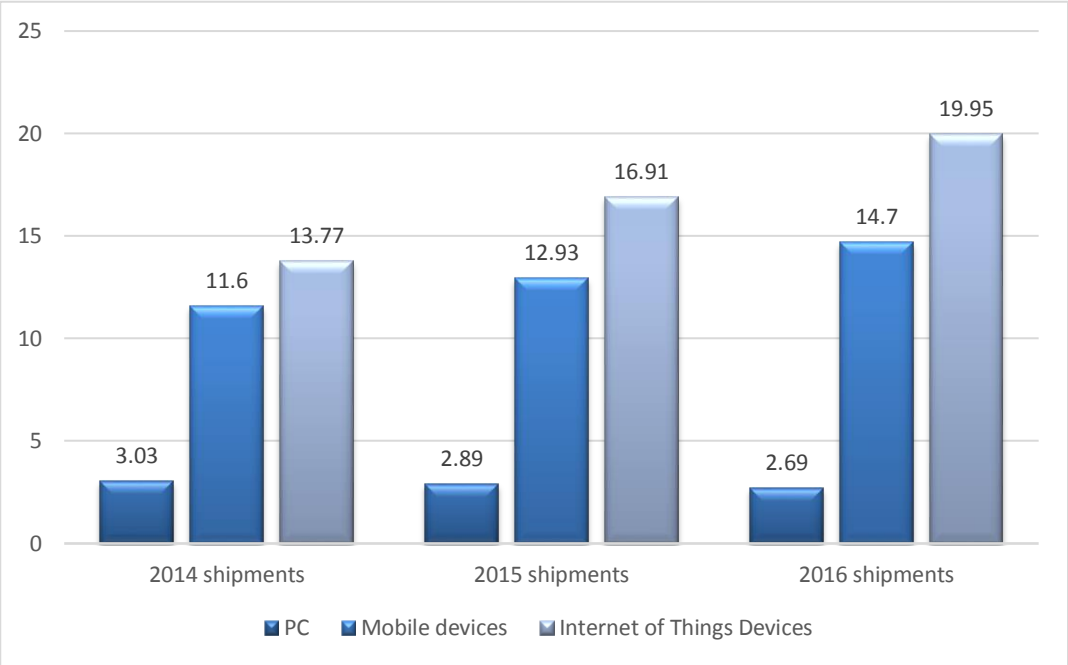

Figure 1-2: The scale and growth of the global internet of things market from 2014 to 2016

According to the IHS forecast, most items will be intelligent by 2025. In the future, everything in the world will be interconnected, from a teacup to a house, and will be networked. The Internet of Things basically covers all aspects of our lives (Figure 1-3).

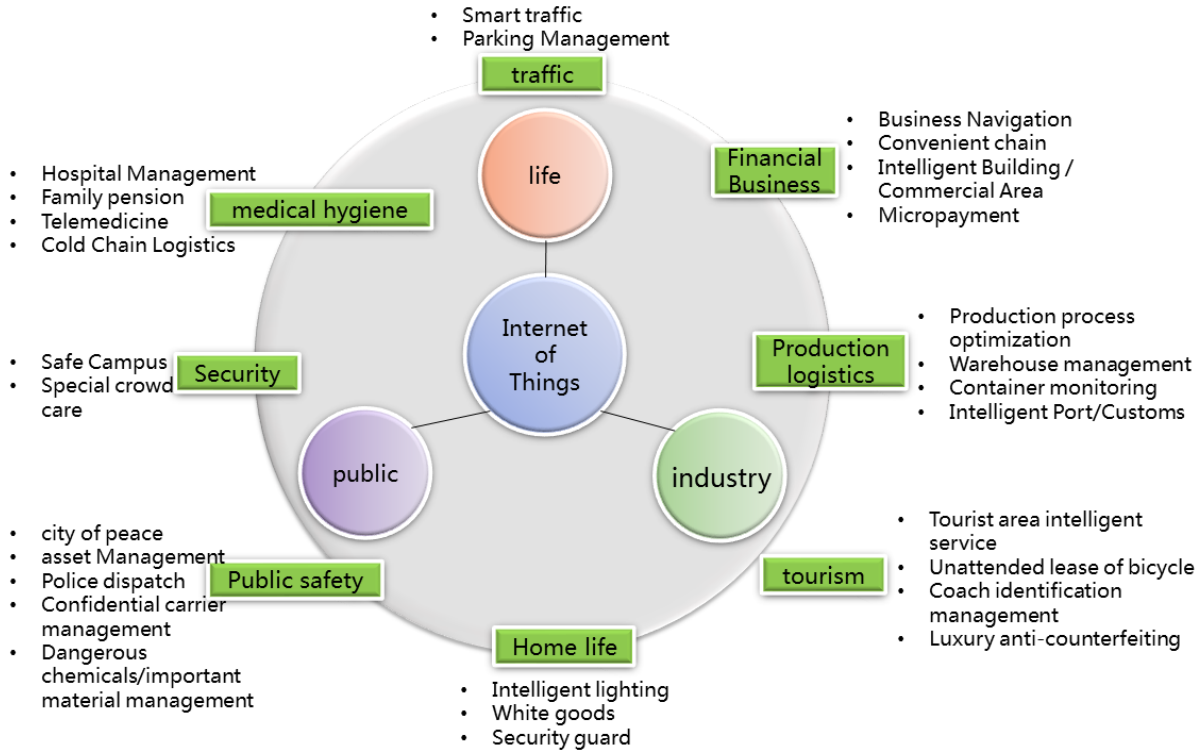

Figure 1-3: Internet of Things applications

In 2016, global companies' spending on IoT technology products and services is expected to reach US$120 billion, and in 2021 this figure will increase to US$253 billion, reaching a compound annual growth rate of 16%. The individual spending on IoT technology services is expected to increase at a compound annual growth rate of 17% in the next five years and reach US$ 143 billion by 2021. With a compound annual growth rate of 20%, Asia is expected to grow at the highest rate, and will account for about 35% of total expenditure by 2021.

With the rapid development of machine learning, after 60 years of ups and downs, the artificial intelligence industry has now formed a new round of momentum in global development. The developed countries have blew the clarion about exploring the mysteries of the brain. In the past year, artificial intelligence has become the most popular keyword in the Internet industry. At the just-concluded Fourth World Internet Conference, unmanned supermarkets, autonomous driving, guided robots, and urban brains... These most eye-catching black technologies are actually projections of artificial intelligence in various fields.

Machines observing the world, the law of machine learning, and the improvement of computing power make it possible to build a neural network. The emergence of massive data allows people to "struggles" their neural networks and artificial intelligence becomes truly smart and available. The CCID Research Institute, a market research organization, predicts that the global artificial intelligence market will reach 269.73 billion yuan in 2018, with a growth rate of 22.3% (Figure 1-5).

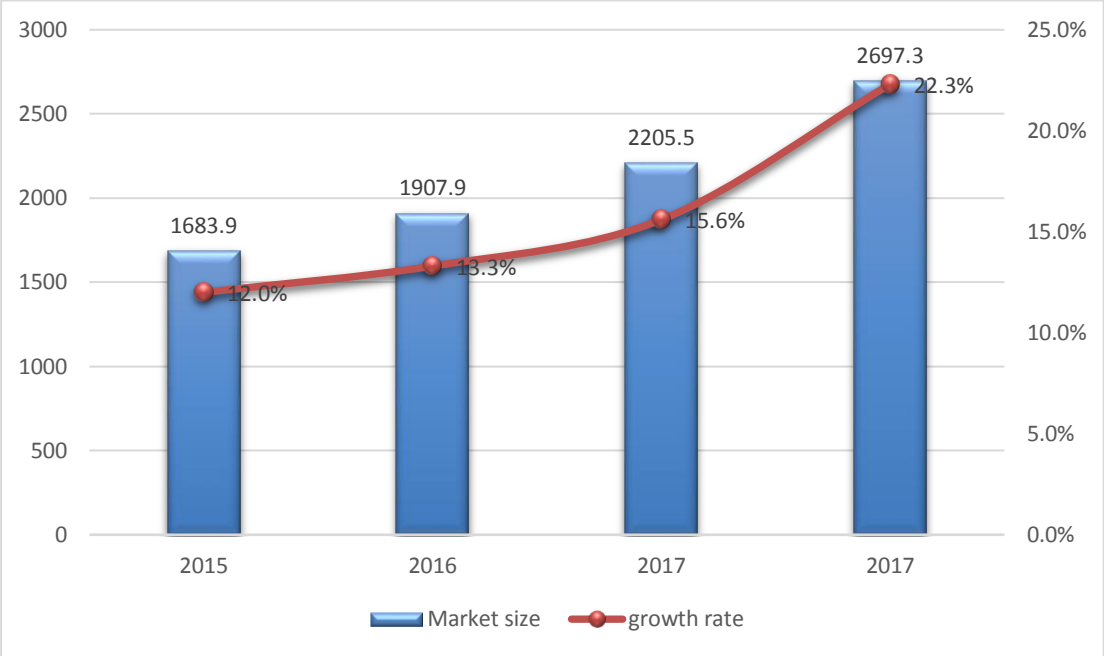

Figure 1-5: Global AI Market Size and Growth Rate

In the future, with the wide application of the Internet of Things, big data will follow. For these data, simply relying on human beings for screening, analysis, etc. will certainly not work. However, the inherent disadvantages of existing database systems are limited in their ability to process such information. Existing computing methods and software capabilities also limit the ability to filter information. The goal of artificial intelligence is to provide people with information processing capabilities that can be surpassed and improve the efficiency of information collection and application. Therefore, the combination of artificial intelligence and the Internet of Things is an inevitable trend.

Two. Excellent case abroad

[Retail]: As one of the early participants in North American AutoID Center and EPCglobal Inc, Wal-Mart began testing and R&D of RFID technology applications in 2001, using EPC to track corporate goods logistics. In June 2003, Wal-Mart announced that it would request its top 100 suppliers before January 2005. The trays or boxes used

for delivery must have electronic tags with various logistics data attached. Although Wal-Mart's top 100 suppliers' RFID application plans have been delayed, Wal-Mart has indeed taken the first step in the large-scale application of RFID technology by chain retailers. The cooperation of relevant suppliers' RFID programs is gradually deepening. Although the e-tagging process was temporarily frustrated, the RFD plans for pallets and containers have been successfully implemented with remarkable results. The latest research report of the Wal-Mart RFID pilot store shows: After conducting a 29-week study of 12 RFID pilot stores and 12 non-RFID stores, the company found that after the implementation of store RFID technology, the out-of-stock rate decreased by 16%. The replenishment speed of goods affixed with an electronic label is three times faster than that of goods using bar code technology; the automatic ordering reduces the inventory

[Manufacturing] Sensors embedded in mechanical devices help identify problems and bottlenecks in the manufacturing process. At the same time, it can also provide predictive maintenance for machines by analyzing machine data. Predictive maintenance means maintenance of the machine only when needed, which saves costs and reduces machine idle time. Caterpillar (NYSE:CAT) is the world's largest manufacturer of construction machinery and mining equipment. It collaborated with machine data analysis Unicorn Uptake to network the machines and then aggregated and analyzed data including equipment orientation and path, idle time, and machine usage, optimized the equipment's operating path, downtime, and maintenance to reduce operations. Cost and increase production.

[Energy industry]: Monitors lighting, temperature, or energy usage through sensors

and processes data in real-time through algorithms to achieve micro-management. AutoGrid is a big data company founded by Amit Narayan, former head of the smart grid research department at Stanford University, which serves the power and energy industries. Through its Energy Data Platform (EDP), utilities, companies, communities and even families can use big data and Cloud software to adjust energy consumption and costs. At the same time, it can help the grid to match the power supply and demand at each end, and reduce the cost of each end of the grid.

[Industrial Wearable Devices]: The AR technology is used in industrial design or installation and maintenance. It provides engineering designers, technicians, or maintenance operators with services such as operating instructions directly displayed in front of them or remote assistance and training for complex problems. Upskill is a provider of content software for industrial augmented reality wearable devices. Its AR software platform, Skylight, can be paired with smart glasses to display the operating information required by the company's workers directly in front of them, avoiding the need to flip through paperwork documents or find them through computers. The file is inefficient and easy to make mistakes.

Three. Internet head business moves in the Internet of Things

The Internet giants in Europe and the United States have all attached great importance to artificial intelligence and Internet of things, and have invested heavily in R&D and distribution in related industries. The performance of major giants in recent years is as follows:

[Google]: On August 17, 2016, Google was revealed that it was based on the

Magenta kernel, a real-time operating system, and developed the new "Fuchsia" real-time operating system. The real-time operating system is an essential operating system architecture for the Internet of Things (IoT) and car networking, so Google's move is also considered to be preparing for the Internet of Things. Android Wear smart watch system, AndroidAuto car networking platform, Google driverless car.

At the same time, Google is opposed to the current telecommunication technology standard setter, the ITU International Telecommunication Union. Because the previous ITU tried to coordinate the governments of various countries, it intends to launch an Internet control agreement. Google specifically launched a "Take Action" website for this purpose, against ITU's dominant telecommunications network technology standards. Cisco, Microsoft, Comcast, AT&T, and Mozilla all have various forms of support.

[Facebook]: Facebook launched a new set of developer tools, Parse, at the F8 conference. The IoT SDK on this development platform can be used to create remote controls for smart devices such as garage door remote control switches and thermostats. In February 2016, Facebook dominated and launched the TIP (Telecommunication Infrastructure Project) program with SK Telecom, Deutsche Telekom, Intel and NOKIA. It aims to unite operators, equipment vendors, system integrators and technology companies to change tradition with innovative technologies. Telecommunications infrastructure construction methods. At present, there are more than 300 TIP members.

[Amazon]: In addition to its smart logistics network, Amazon has recently been developing and deploying drone express delivery projects. In addition, Amazon Echo star products are sitting on smart homes. On the surface, Amazon's drones and space

rockets are all developed toward "shipping" and "express". However, since they can meet the demand for shipping, they can also achieve satellite and drone-free Internet base station layouts. The drone's control technology must integrate the SON ad hoc network technology that the existing telecommunication operators are researching and developing. This technology is also the key industrial Internet and car networking technology, and it can be mutually compatible with Amazon's express logistics system.

Second. Initial heart analysis

One. Pain problem

The Internet of Things and artificial intelligence are regarded as the third wave of information technology in the world, and it is the key to establishing the competitive advantage of the information society in the future. According to Forrester, an independent market research agency in the US, the value of the Internet of Things brought by the Internet of Things is 30 times higher than that of the Internet, and the Internet of Things will form the next high-tech market with a scale of RMB 1,000 billion. However, the current Internet of Things industry still has many problems that affect the further expansion of the Internet of Things market size. These issues include:

1, the problem of information fusion

The Internet of Things will become a huge network linking the world in the future. However, because of historical reasons, the original equipment comes from different vendors, different generations, and there is a lack of unified communication standards among many devices, and it is difficult to integrate the original equipment. More importantly, since manufacturing equipment and information systems involve multiple manufacturers, the originally centralized systems are mainly controlled by manual or central computers. It is difficult to obtain all the information in the link process in real time, which seriously affects the efficiency of interconnection and interoperability. It also restricts the effectiveness of the Internet of Things in the actual application process.

2, the issue of security risks

In the era of the Internet of Everything, information security is of utmost importance.

Network systems may be attacked by hackers and viruses at any time and need to be effectively resolved from a technical perspective. Although most equipment manufacturers are developing functional safety systems and have already put into use. However, for the interconnection in the era of intelligence, the security of one unit will affect other units. The downtime of a certain machine will cause a huge amount of associated waste. Therefore, the security of the integrated system becomes an issue that needs urgent attention. Under the centralized technology framework, this problem is difficult to solve fundamentally. Once the central node has a security failure or the central node is compromised, the results can be very serious. Current IoT devices have the ability to access and control the user's devices. Once a security problem arises, the personal safety of the user may be very serious. The consequences are very serious.

3, the problem of data transmission

The traditional IoT model collects information of all connected devices from a centralized database. The cost of building and maintaining centralized cloud servers and large-scale network devices is very high. When the era of the global Internet of Things comes, the number of connected devices on the information physics system will be tens of billions. They will generate huge amounts of data and require real-time communication, which will greatly increase transmission costs.

4, the problem of transformation costs

When the revenue of the Internet of Things cannot reach market expectations, the cost of the Internet of Things remains excessive. Many existing IoT solutions are very costly, because in addition to the middleman costs of these services, the infrastructure

and maintenance costs associated with centralizing cloud and large server farms are very high.

Today's IoT solutions also have a mismatch between service provision and customer expectations. In the past, the cost and revenue of the information technology industry have been very consistent. Although the service life of large servers is many years, the manufacturers and buyers have signed support contracts. Personal computers and smart phones do not have such lucrative support plans, but their product life cycle is shorter, which is not a big problem. But for the Internet of Things, equipment manufacturers do not have enough profits to make up for the cost of supporting and maintaining equipment for many years. The cost of supporting and servicing hundreds of billions of smart devices will be enormous—even the cost of maintaining centralized servers that distribute upgraded software is very high.

5, business model issues

First of all, most of the current Internet of Things business models rely solely on the sale of user data or targeted advertising. This model obviously cannot support its huge IoT market. It is difficult to establish a corresponding threshold, and ordinary consumers may open their own data sharing, but corporate users will not do so.

Second, unlike personal computers or smart phones, most of the IoT smart devices are sold at one time, and it is difficult to obtain revenue from subsequent applications because the IoT smart devices are far less playable or interactive than individuals. Computers and smart phones do not require a lot of human-computer interaction with users, so it is difficult for users to spend money on this.

Third, the complexity and diversity of IoT devices, communication and interaction between different devices are very troublesome, and it is likely to cause security risks. It is impractical to imitate the Internet or mobile Internet to build an ecosystem. So it's hard to make money in this way.

6. Inadequate preparation and misunderstanding of traditional enterprises for technology

The digital wave surges, and traditional enterprises have not taken time to prepare for it. This is mainly manifested in: lack of awareness and mastery of emerging technologies, combined application capabilities with the industry need to be improved, lack of composite talents, responsiveness and agility Not enough sex, internal data islands and so on.

The core of the Internet of Things application is the analysis and application of data. However, it is difficult to rely solely on the IT department to promote. The application of data requires the close cooperation of the operating department. However, the operation department often lacks awareness in this regard and needs to cultivate the way of thinking based on data.

Two. Solutions

1st. The concept of blockchain

Blockchain is an important concept of Bitcoin. It is essentially a decentralized database. In a narrow sense, a blockchain is a chained data structure in which data blocks are sequentially connected in a time-ordered manner, and cryptographically ensured non-falsifiable and unforgeable distributed ledgers. Broadly speaking, blockchain

technology uses block-chain data structures to verify and store data, uses distributed node consensus algorithms to generate and update data, uses cryptographic methods to secure data transmission and access, and uses automated scripts. A brand-new distributed infrastructure and computing paradigm for code-forming smart contracts to program and manipulate data.

In general, blockchain technology refers to a way for all citizens to participate in accounting. There is a database behind the system we are using. If you think of the database as a large book, then it is very important for anyone to remember the book. Under the current technology pattern, whoever's system is responsible for keeping accounts, WeChat's account book is Tencent's account, and Taobao's account book is Ali's record. In the blockchain system, everyone in the system has the opportunity to participate in billing. If there is any data change within a certain period of time, everyone in the system can come to make an accounting. The system will judge the fastest and best person during this period, write the contents of his records to the account, and The contents of the book are sent to all other people in the system for backup during the period. Everyone in this system has a complete book. In this way, we call it blockchain technology.

2nd. The advantages of blockchain technology

The advantages of the blockchain technology model for universal bookkeeping are obvious, including:

1. Security: While sacrificing a bit of efficiency, great security can be achieved. The entire system does not have a large central book (decentralized) and cannot be

destroyed. Each node is only part of the system. Each node has the same rights and has exactly the same books. Destroying some nodes has no effect on the system at all.

2. Reliable: Once the information is verified and added to the blockchain, it will be stored permanently. Unless more than 51% of the nodes in the entire system can be controlled at the same time, the modification of the database on a single node is invalid. So even if a hacker controls a handful of computers to change information, the system will still refer to most people's opinions to determine what is the true result. Hackers will find that modifying their own books is completely meaningless.

3, high efficiency: As there is no centralized intermediary agencies, so that all things are automatically run through a predetermined program, not only can greatly reduce costs, but also improve efficiency. And because everyone has the same books, it ensures that the bookkeeping process is open and transparent.

4. Smart contracts: Smart contracts are contracts that use computer language instead of legal language to record terms. Smart contracts can be executed automatically by a computing system. From the user's point of view, a smart contract is usually considered as an automatic guarantee account. For example, when certain conditions are met, the program will release and transfer funds. From a technical point of view, smart contracts are considered network servers, but these servers are not set up on the Internet using IP addresses, but are set up on the blockchain so that specific contract procedures can be run on them. The potential benefits of smart contracts include lowering the costs of contracting, executing, and monitoring; therefore, this is a significant reduction in labor costs for many low-value transaction-related contracts.

Three. Internet of things and blockchain solution

Various mature technology companies and start-up companies have been exploring the use of blockchain and the Internet of Things for integration. The currently popular solutions mainly include the following:

1. IBM

IBM was one of the first companies to announce their development plans for the blockchain. It has established multiple partnerships at various levels and demonstrated their love of blockchain technology. It has published a report indicating that blockchain can be the best solution for the Internet of Things. In January 2015, IBM announced a project, the ADEPT project, a research project that uses P2P's blockchain technology. IBM also established a proof-of-concept system with Samsung for the next generation of IoT systems. The system is based on IBM's ADEPT (Autonomous Distributed Peer-to-Peer Network Telemetry). The ADEPT platform consists of three elements: Ethereum, Telehash, and BitTorrent. Using the platform, both companies hope to bring a device that automatically detects problems, automatically updates them, and does not require any human operation. These devices will also be able to communicate with other nearby devices to facilitate battery power and save energy.

2, Filament

Filament has proposed their sensor device, which allows the rapid deployment of a secure, full-range wireless network in seconds. The device can directly communicate with other TAP devices within 10 miles and can directly communicate via mobile phones and tablets. Or computers to connect, the company uses blockchain-based technology stack

operations, blockchain technology enables Filament devices to process payments independently, and allows smart contracts to ensure the trust of transactions. The company was founded in 2012 and the company recently received $5 million from Bullpen Capital, Verizon Ventures and Samsung Ventures. Joint investment.

3, Ken Code - e plug

ePlug is a product of Ken Code. According to Ken Code's white paper, ePlug is a small circuit board that is located inside the "ePlug certified" power outlet and light switch. For safety and reliability, the product offers optional Meshnet, distributed computing, end-to-end data encryption, wireless connectivity, timers, USB interface, temperature sensors, touch sensors, light and motion sensors, and for providing alerts The LED light, this product is based on the blockchain login method to ensure security, once the correct network address, URL, ePlug owners will see a login interface, initially, blockchain platform like OneName. Io and KeyBase. Io will be used to authenticate to login to ePlug.

4, Tilepay

Tilepay Object PayPal: Provides a people-to-machine or machine-to-machine payment solution for the existing IoT industry. The company has developed a micropayment platform. Tilepay is a decentralized payment system that is based on Bitcoin's blockchain and can be downloaded and installed on a personal computer, laptop, tablet or mobile phone. The networking design will have a unique token and be used to receive payments via blockchain technology. Tilepay will also set up an Internet of Things data transaction market so that everyone can purchase data on various

devices and sensors in the Internet of Things. P2P is used to ensure the secure transmission of data and payments.

Third. Business model

One. design concept

1st. Decentralization

Blockchain technology can provide point-to-point direct interconnection of the Internet of Things for data transmission, rather than through the central processor, so that distributed computing can handle hundreds of millions of transactions. The efficiency of the entire system can be greatly improved. At the same time, the computing power, storage capacity, and bandwidth of hundreds of millions of idle devices distributed in different locations can be fully utilized for transaction processing and the cost of calculation and storage can be greatly reduced.

In addition, blockchain technology superimposes smart contracts to turn each smart device into a self-sustained and regulated independent network node. These nodes can perform information exchange with other nodes or verify identities, etc., based on pre-defined or embedded rules. Features. In this way, regardless of how long the equipment life cycle is, IoT products will not be out of date, saving a lot of equipment maintenance costs.

Finally, in the traditional centralization networking, there is a lack of trust mechanisms between devices and devices. All devices need to be checked with the data center of the Internet of Things. Once the database collapses, it will cause great damage to the entire

Internet of Things. The blockchain distributed network architecture provides a mechanism to maintain consensus among devices without the need to verify with the center. Even if one or more nodes are compromised, the data of the entire network system is still reliable and secure.

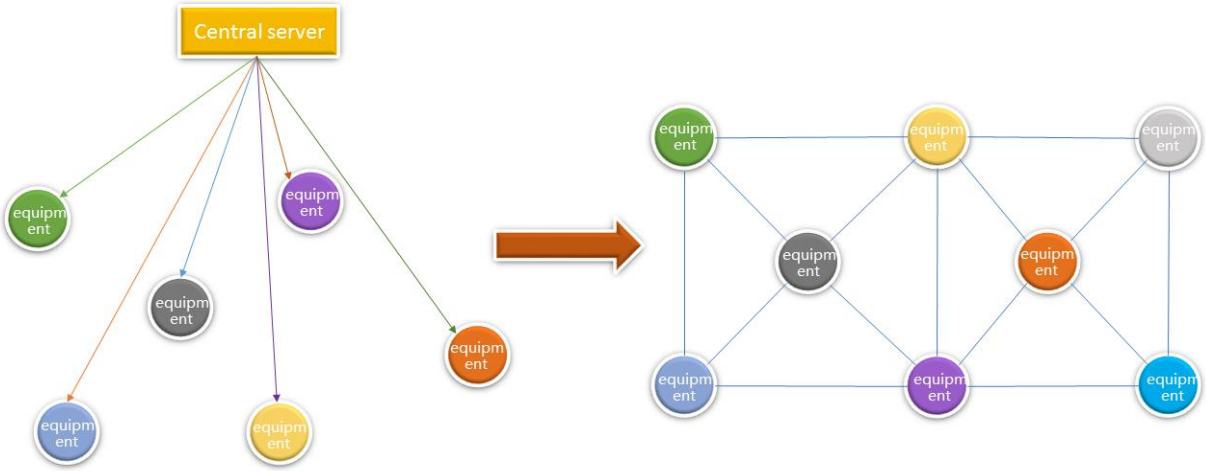

Figure 3-1: Decentralized Networking Architecture

2nd. Traceable

The block chain structure of the deep object chain means that the source of its origin can be found through any block, and the information is unchangeable and cannot be forged. This technical feature can be used to mark assets and asset transfers. It can also provide non-tamperable multidimensional event records. It can also be used to trace sources to track the flow of assets. Using traceability features to connect all items in the Internet of Things to each other, using blockchain technology to demonstrate the true end of traceability without being tampered with. The Internet of Things (IoT) devices supported by any blockchain technology are completely transparent. In this way, the problems of security and trust in the traditional Internet of Things can be solved.

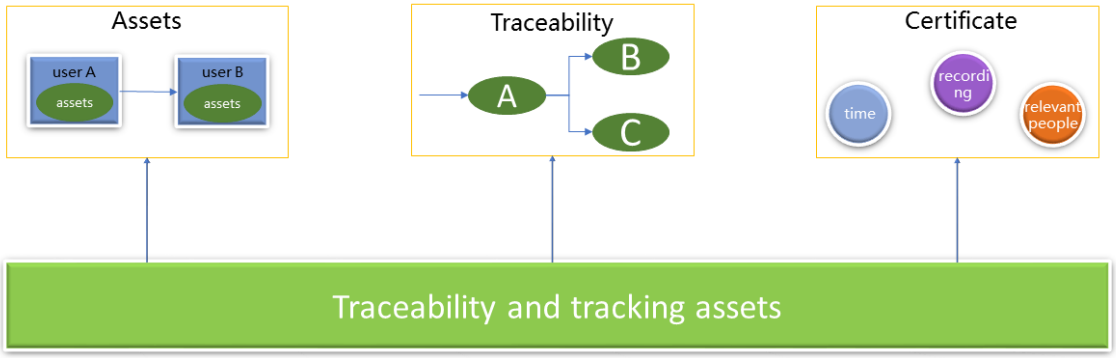

Figure 3-2: Trace source block chain structure

3rd. Side chain ecosystem

Using traditional models, it is difficult to imitate the Internet or mobile Internet to build ecosystems because of the difficulty in the flow of information between devices and the lack of power for data exchange. With blockchain technology, it is possible to attract a large number of partners to develop sidechain projects on the basis of the public chain. No matter where the big data can be realized through Token payment value, it can be provided to the partner sidechain to achieve accurate and efficient Cooperation model. Through the characteristics of the blockchain, the interaction between different domains and different devices is realized. Different partners are added to the Token incentive mechanism to form a complete IoT ecological environment. Reliable business model will be born.

Two. business model

Based on the above design philosophy, the project team proposed the deep physical chain project. The main mode of the project is as follows:

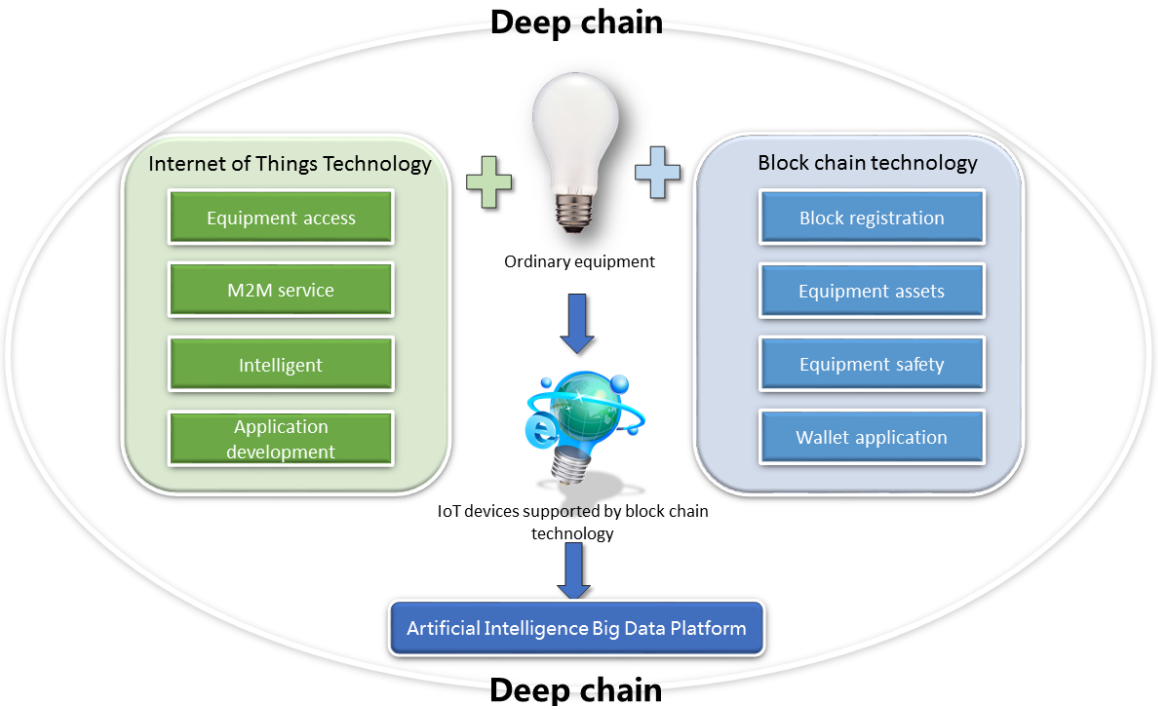

Figure 3-3: Project Mode

The deep object chain combines blockchain technology with the Internet of Things and artificial intelligence technologies to replace the module stack in traditional IoT devices with a module that supports the Ethereum protocol, and devices can access the deep object chain. There is no need for major adjustments and changes to the equipment, and vendors do not need to make too many changes. However, the background technology of the equipment has been upgraded to blockchain technology. Authentication, encryption, device sharing, and device configuration are all core technologies that use blockchain. On this basis, the deep physical chain will upgrade the traditional Internet of Things into a decentralized blockchain IoT. All collected data is presented to the user after processing in the background artificial intelligence big data platform.

Three. Project value

Through the deep physical chain, various problems in the traditional Internet of Things system can be solved. The value is very significant, mainly manifested in：

1st. cut costs

The current Internet of Things solutions are very expensive, the construction of central servers, and the construction of infrastructures increase their costs to a certain extent. At the same time, services such as big data service categories are not very good in the market experience to a certain extent, the accuracy of existing data is not very high, and the breadth of applications is also affected by data of various types of various industries; The deep chain is decentralized. The blockchain does not require a central server and requires relatively low infrastructure. This avoids expensive operation and maintenance costs and maintenance costs. The accuracy of the data has also been improved to some extent, which has enhanced the practical value of the data and reduced the application cost of the data.

2nd. Identity authentication

The Internet of Things is a very special network. The transmission of data has relatively large differences in requirements for delays, different protocols, and precision. The security between data is particularly important, and the deep object chain will pass the block verification in the chain. The consensus mechanism filters user intents to prevent illegal and malicious nodes from accessing the Internet of Things to ensure user security.

3rd. Renewable

The deep object chain will use modern cryptography techniques including

cryptographic hash functions and elliptic curve public-key cryptography techniques. As long as the data is written into the blockchain through a consensus mechanism, all data information is stored in a time-stamped chain block structure. The interactive data cannot be tampered with, and the data can also rely on the chain structure to track its source.

4th. Cross-subject collaboration

The deep object chain will use modern cryptography techniques including cryptographic hash functions and elliptic curve public key cryptography techniques. As long as the data is written into the blockchain through a consensus mechanism, the interactive data cannot be tampered with, and the data can also rely on the chain structure to track it. source.

5th. privacy protection

User privacy protection of the Internet of Things is extremely fragile. Collecting user data through a large number of sensors, it is very easy to predict user behaviors by analyzing the data. Moreover, the current architecture model uses the OpenID method to perform user desensitization, as long as multiple dimensions compare the data. , It is also easy to infer the user's identity information. In response to this problem, blockchain transmission data of deep-linked chains will be strictly encrypted using the AES (Advanced Encryption Standard) algorithm. All transmitted data will undergo strict encryption processing, and user data and privacy will be more secure.

6th. Assisting AI to collect data

Artificial intelligence does help us deal with more data, and it will become more

and more "smart." However, the Internet of Things has shouldered a crucial task: data collection. Conceptually, the Internet of Things can connect a large number of different devices and devices, including home appliances and wearable devices. Sensors embedded in each product constantly upload new data to the cloud. These new data can later be processed and analyzed by artificial intelligence to generate the required information and continue to accumulate knowledge. Deep chain will link global equipment, provide more data for artificial intelligence, help artificial intelligence become more intelligent, and the two will form a complementary pattern.

Fourth. Core Values and Differentiation Introduction

Deep chain is a project that combines AI, IoT and blockchain technologies. This project has the following core values and differentiated advantages:

One. Wide range of application scenarios

Deeper chains reduce the error or fabrication information of the Internet of Things through the decentralization of blockchains, smart contracts, and transparency. The advantages of using blockchains include preventing double information and forging data. The deep material chain will establish a global, permanent and effective IoT data center that will continue to be updated, allowing IoT devices and incremental IoT devices to access the blockchain and allow a large number of third-party organizations to And the company establishes side chains on the deep link chain, enriches the ecological environment of the entire platform, and realizes a diversified blockchain IoT application scenario. At that time, globally connected IoT devices will be seamlessly connected to the deep physical chain. ,Each device, every consumer can enjoy the safe, convenient, high-efficient life of Internet of things.

Two. Deep integration with artificial intelligence

Currently, many of the projects linked with blockchain and Internet of Things do not include artificial intelligence technology. Although both are in different fields, they can be well integrated. For artificial intelligence, the more data it can process and learn from it, the better its prediction accuracy will be. The Internet of Things can provide far more accurate data for artificial intelligence. Deep object chain is a blockchain project that deeply integrates the internet of things and artificial intelligence. Through the deep

material chain, users can provide more accurate and intelligent analysis data, allowing users to better judge and analyze the operation of the equipment. Situation, make targeted countermeasures. In addition, with the continuous development and improvement of artificial intelligence technology, smart device products on the market are also increasing, and the vast majority of smart products have limited technological content, and it is difficult to meet the continuously upgraded intelligent requirements to a great extent. Through deep-chain technology, the device can be self-learning and achieve a spiral upgrade of smart Internet of things devices.

Fifth. Application scenario

From an objective point of view, the characteristics of blockchain technology have a decisive role in solving the problem of the Internet of Things.

1. Going to the center: Based on the characteristics of decentralization, the goal of "all things can be linked" is realized. Each device can be seamlessly docked in the blockchain, becoming a terminal, efficient communication between points. Can greatly improve, the original "point - center - point" structure into "point - point - point" of the network structure, more in line with the characteristics of the Internet of things.

2. Security: In the traditional mode, once there is a problem at the central node (such as hackers, staff corruption). The entire system will be in danger of collapsing. The security brought by the decentralization of blockchain technology inherently solves this problem. The information of each device is traceable. This avoids the harm caused by hacking attacks and causes problems in any node. It will not cause fundamental damage to the entire system.

3, information transparency: based on the blockchain data information is transparent, can not be changed characteristics, in the implementation of IoT device access process, you can save such as equipment inspection, data verification and other non-trust-based redundant work, you can reduce The cost of running the Internet of Things.

4. Smart contracts: Under the rules defined in the blockchain, the ability to automatically trade between IoT nodes will result in a brand-new business model. Each node in the network can act as an independent business entity with very low transaction

costs. Other nodes share their own capabilities and resources. Information dissemination between IoT devices becomes inevitable, and the device itself generates its own value. This will give the IoT industry a great imagination.

The deep object chain applying blockchain technology can be applied to various fields of the Internet of things in terms of technology theory. However, from the perspective of market, the early stage of the project mainly focuses on the following aspects:

One. Smart city

Smart devices have been used to track the status of bridges, roads, and power grids, and the IoT blockchain can link all of these together, sharing high efficiency, and predicting usage and pollution. Another important application is to help remote areas monitor natural disasters and prevent large-scale mountain fires, pests, and other major disasters.

Two. Smart transportation

We believe that every car in the future is a node. After receiving the trusted data for confirmation, the network will immediately pass it to other nodes and transmit the information to the rear vehicles without the need for a centralized server. Traffic information will be linked to the deep physical chain, traffic jams, accidents, driving, petrol station conditions, along the way will be presented on the chain, effectively solve the traffic problem. Extending it to global trade, this transportation network can include water, air and ground transportation networks to track cargo transportation.

Three. Intelligent maintenance

With the increase in the use of smart devices, more or less, there will be some problems, and maintenance is a topic that can never be passed, ordinary telephone scheduled maintenance services, as well as various Internet scheduled maintenance services, because of efficiency reasons, can not meet the majority Consumer needs, because these require the user to find the equipment can not be used, will think of it to go for repairs, and then there will be a special maintenance staff home repairs, but in the end will be due to cost issues arising from various disputes and dissatisfaction.

If the user is allowed to use the deep physical chain, the smart device recognizes the collected self information and, in case of maintenance, obtains the user's consent and completes the smart contract for maintenance with the manufacturer. This can greatly improve the efficiency and satisfaction of maintenance.

Four. Smart medical

Smart medical care is the key direction for future medical development, especially in countries with a more serious aging situation. Older people have poor autonomy, and once they are ill it is difficult to get medical care. If a deep physical chain is used, in the unlikely event that an elderly person is seriously ill, the deep physical chain will automatically notify the nearest hospital. The doctor can remotely access the elderly through a deep physical chain (requires authorization) to perform remote diagnosis and obtain the disease based on historical data. The possibility of hair, given a quick treatment plan to help the elderly through the dangerous period.

Five. Traceability

（1st） Reverse tracing

Counterfeit and shoddy goods are a phenomenon hatred by consumers all over the world. However, under the existing technical and legal framework, this issue is difficult to solve. However, the use of deep material chains can achieve informationization, standardization and transparency in the process of commodity circulation, and can effectively solve the problems of counterfeiting and counterfeiting in commodity circulation, label forgery, counterfeiting by distributors, difficulty in auditing by competent authorities, difficulty in public identification, and other issues. . The deep material chain provides consumers with a complete product quality traceability service and provides the government with full quality supervision data, creating a new intelligent closed-loop management model for commodity circulation from retrospective, anti-counterfeiting, supervision to counterfeiting. All product information, anti-counterfeit data are in the hands of manufacturers, counterfeit manufacturers can not start, consumers can rest assured to buy.

（2nd） Reverse tracing

The deep physical chain can not only realize the backward traceability, but also can realize the positive traceability. For example, an auto parts manufacturer wants to know its own parts sales, and it can create a unique traceable two-dimensional code for each part through the deep material chain and cooperate. Requests or tokens encourage the traceability of the records of each downstream link. In this way, the car manufacturer can know where their parts are being used and which problems have arisen, providing convenience for the manufacturers' after-sales and consumer data acquisition.

Six. Intelligent Manufacturing

Through the deep physical chain, we can connect sensors, control modules and systems, communication networks, and ERP systems in manufacturing companies, and enable companies, equipment manufacturers, and production safety supervision agencies to work long-term through a unified ledger infrastructure. Continuously supervise all aspects of manufacturing and improve the safety and reliability of manufacturing. At the same time, through the deep physical chain, it is easy to find problems, track problems, solve problems, and optimize the system, greatly improving the intelligent management level of the manufacturing process. It is also possible to cooperate globally through the deep material chain. For example, a certain manufacturer can only produce and process cotton, and it can find other raw material partners on the deep material chain to produce cotton clothes. During the entire production and material exchange process, deep material chains Token will play a key role.

Seven. car

（1st） Family car

With the popularization of automobiles, vehicle maintenance has become a problem that every user must consider. Under normal circumstances, owners will only arrange time for testing and maintenance at 4S stores after discovering problems with the car. The inconvenience, many of which continue to drive after the occurrence of the problem, will cause permanent mechanical damage to the vehicle.

The deep object chain allows users to know the abnormality of the car and the abnormality of the car data through the point-to-point method. The trip computer pre-

stores some fault configurations. After the user collects the information, he can automatically match the fault case. Of course, the user can also choose to send it to the 4s shop for diagnosis. . After the 4S shop diagnosis is completed, the fault case is matched, and then the 4S shop arranges the time for the owner to go to the shop for maintenance. All this can be accomplished through a smart contract, which greatly improves the number of effective maintenance of the 4S shop, and also allows the owner to be more peace of mind.

（2nd） taxi

Nowadays, the Internet of Things taxi model is shared through a centralized model. The biggest problem with platformization lies in the charges. Taxi revenues that are not as high as those used in taxi platforms and centralization platforms also need to be partially spent. The material chain can send requests to the node network through the user. If the taxis agree, they can directly reach a smart contract with the user, eliminating the cost of centralization and reducing the cost of traveling for taxi drivers and ordinary users.

In addition to these devices, other services such as sharing bicycles and sharing charging treasures can use this project's services to solve the widespread problems of trust and profit, allowing more players to participate in the market and truly realize the significance of sharing.

Sixth. Governance structure

The deep chain project uses the form of a foundation for governance.

The Foundation is committed to the construction and governance of the deep physical chain. The main objective is to ensure the sustainable development of the deep-chain project, as well as the fund-raising security and management effectiveness. The organizational structure of the Deep Link Foundation consists of a decision-making committee, a fund autonomy committee, and an executive committee. The governance structure includes operational procedures and rules for daily work and special situations.

In order to prevent community members from appearing inconsistently, making inconsistent decisions, and even resulting in divisions of the community, the Foundation clarifies the general affairs and privileged matters of the management community by formulating a good governance structure. The design goal of the foundation's governance structure is to maintain the development sustainability of the platform's ecology, decision-making efficiency and capital management compliance. The Foundation exercises daily powers by the decision-making committee.

After the expiry of the term of the policy-making committee, five core members of the decision-making committee will be selected by the community vote. The selected core personnel will make important and urgent decisions on behalf of the foundation, and will need to conduct credit investigation during their term of office. At the beginning of the foundation, in order to facilitate the rapid advancement of the project, members of the first decision-making committee will be composed of team members and early investor representatives for a term of two years, and will be re-elected by the community

vote after the expiration of the term. The decision-making committee consists of 5 members, of which the team represents 3 people and the early investor represents 2 people. All decisions are made with 3/5 multi-signature.

One. Token introduction

The early phase of the deep material chain is developed on the Ethereum base, and later on it will develop its own public chain. Deep chain tokens are contract tokens based on the ERC20 Ethereum implementation for the creation of main and sub-chains (food chain, traffic chain, manufacturing chain, etc.) and settlement of transactions. The creation of any sub-chain requires a deep physical chain token. As the ecosystem grows, more and more merchants will join the ecosystem. Merchants need to consume large amounts of tokens to create various sub-chains. The demand for deep chain has been continuously improved.

Deep object chain tokens are the only tokens for the entire deep physical chain ecosystem. Any cross-sub-chain data exchange and asset exchange require tokens. When the ecosystem is formed, cross-chain data interactions become high-frequency events. At the same time, the demand of deep merchant chain tokens has been continuously increasing.

Two. Release notes

A total of 10 billion pieces of dark chain tokens are issued. The distribution plan is as follows:

Table 1: Deep-chain token issuing plan

proportion	Quantity	Distribution plan	instruction manual
1%	100000000	Technology development	For technical team recruitment, system development and maintenance, the project will be released on a monthly basis in 60 phases.
2%	200000000	Project operation	For the operation and maintenance of deep physical chain projects, including development, marketing, operations, and third-party agency services.
2%	200000000	foundation	The foundation reserves and the project is released on a monthly basis in 60 phases
2%	200000000	Crowdfunding	Crowdfunding for the public, opening 1000000 DSC shares a day, and the proportion of crowdfunding based on the lowest price of the previous day's exchange
1%	100000000	Angel investment	Sales to institutional investors at the agreed price. The project will be released on a monthly basis in 12 phases.
2%	200000000	Community promotion	Promotions, airdrops, candy programs, etc., for the early development of community users, to stimulate vitality
90%	9000000000	Community incentives	Create a community for community promotion, user awards, support for third-party developers, organize various events, establish ecological, lock-in awards, etc. This section of Token does not participate in lock positions and does not participate in platform dividends

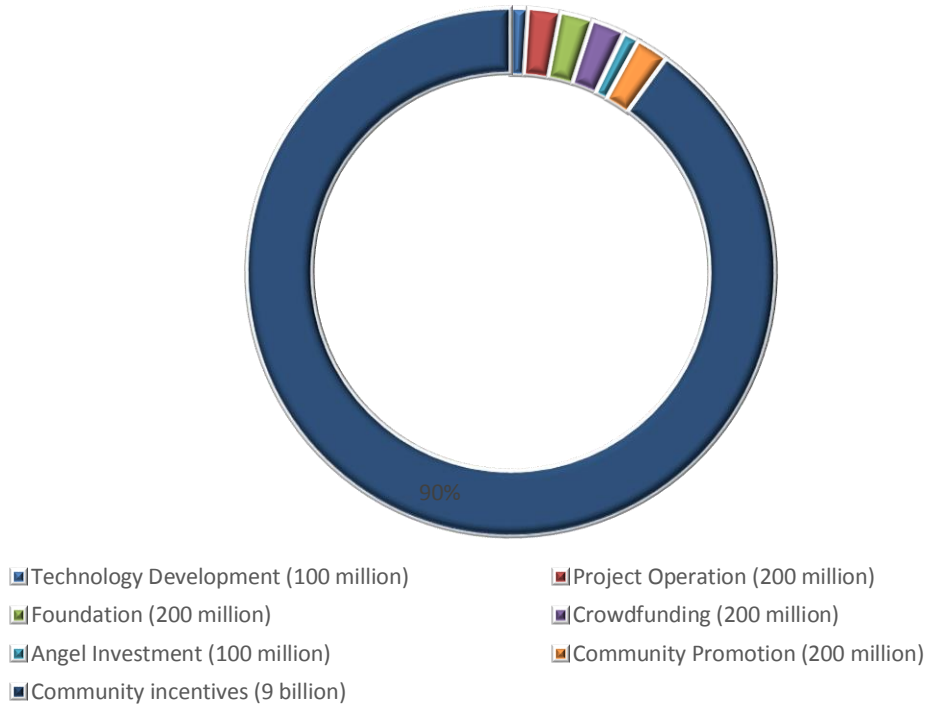

Figure 7-1: Token Distribution Plan

Seventh. team introduction

The project team members are senior experts in the relevant fields of the industry, and they have rich resources and experience. In addition, a lot of work has been carried out in the early stage of the project and the results have been outstanding. Details are as follows:

【project team】

Alexander Zhou (Chief Architect)

Alexander is a core researcher in the blockchain and digital currency and internet finance business of an international consulting firm. He has deep industry expertise and rich consulting experience. He is committed to solving a series of strategic and cognitive issues for the company. He has served clients such as Tencent, Alibaba, Anda Insurance, Goldman Sachs, Haitong International, PricewaterhouseCoopers. Alexander has been engaged in blockchain research for 3 years and has a unique understanding and understanding of blockchain and digital currency. His opinions were deeply appreciated by executives of traditional finance companies and blockchain industry practitioners, and he promoted the Chinese community. The cognitive changes in blockchain technology and digital currency have made clear that blockchain and digital currency are cores of Distributed Database, and P2P Network and Consensus Design and other technologies are the underlying consensus. Alexander is convinced that ICO is the best way to transform the current financial industry's cumbersome financing methods and processes. With its efficient and low-cost financing functions, ICO will greatly promote the development of human science and technology based on blockchain technology,

so as to better benefit the society, and give investors of digital currency projects a quick, safe and stable return.

Alex Feng (Foundation Director)

Alex is a senior technical person in the Internet field in China. He has many years of experience as an architect in Alibaba and Tencent. He is well known for cloud computing, low-level system architecture and operating system development, and has applied for patents on virtualization and cloud storage. Alex is also proficient in multiple computer languages and has been deeply customizing Tencent Cloud Architecture & Big Data solutions and developing an implementation plan.

David Li (Senior Engineer)

David is a Ph.D. in Computer Science from Princeton University in the United States. He has worked at Microsoft and has extensive experience in program development. He has participated in the upgrade and maintenance of Microsoft's various operating systems. David has more than five years of experience in App development.

Sherry Wang (Cryptographic Algorithm and Distributed Data Engineer)

Sherry is fluent in cryptography and distributed databases. He has worked as a Google data engineer and is familiar with distributed, fast, machine learning algorithm platforms that support massive data, data mining platforms, and BI business and decision support platforms. He was responsible for the development, operation, maintenance and optimization of data foundation components, construction and maintenance of big data warehouses, basic application and encryption algorithm model development.

Upadhi Kabra (Chief Financial Officer)

Upadhi used to be an executive director of JPMorgan Chase and a Wharton MBA. He has many years of practical experience in financial product management, risk control, strategic analysis, project execution, and money management.

Bob Song (Chief Operating Officer)

Former director of Silicon Valley start-up company marketing, deep understanding of customer growth, can accurately grasp the market outlets and positive direction, flexible use of a variety of marketing and psychological means, such as hunger marketing, viral marketing, hacking growth, control the key to event marketing time frame.

【Project Consultant】

Luke Taylor

He is a professor of finance at the Wharton School of the University of Pennsylvania, a doctor of finance at the University of Chicago, and a senior financial expert at McKinsey. He has also worked as an off-site consultant for several CEOs and hedge funds and venture capital funds. Dr. Taylor has unique insights and in-depth studies on innovation in financial products, and has published several academic research papers in the Journal of Finance, Journal of Financial Economics, and Review of Financial Studies, as well as written articles for Forbes and the Wall Street Journal.

Alexander von Preysing

Deutsche Börse Senior Vice President, President of Distribution Services. In 2002, he joined Deutsche Börse and was responsible for several departments. He was proficient in bonds, private equity funds, risk management, IPO and other businesses, and made

good achievements.

Genevieve Leveille

Estonian state blockchain blockchain technical consultant and founder of digital currency influence organization. He graduated from Columbia University in the United States and has experience in the information technology and service industries. Strong entrepreneurial spirit, good at cash, market risk, liquidity management, treasury and business transformation.

Andreas Grosjean

Member of the board of directors of Ming Le Sports AG, Chairman of the Supervision Committee of GoldRooster AG, Member of the Munich Stock Exchange. He graduated from Ludwig-Maximilians University in Munich. There is experience working in the investment banking industry. Proficient in computer knowledge, entrepreneurship, venture capital, securities, and stocks.

Greg Ganger

Professor of Computer Science at Carnegie Mellon University, postdoctoral fellow at MIT. Dr. Ganger specializes in large-scale infrastructure building and distributed data storage, and serves as director of Carnegie Mellon University's CS lab.

Eighth. Risk Warning and Disclaimer

- As a new investment model, digital asset investment has various risks. Potential investors need to carefully assess the investment risk and the bearing capacity of their own risks.
- This document is used to guide the progress of the deep chain project. It is only used to convey information and does not constitute the relevant opinions on the sale and purchase of digital currency in the deep chain. The above information or analysis does not constitute an investment decision. This document does not constitute any investment advice, investment intentions or teaching investment.
- This document does not constitute or understand any act of buying or selling any invitation to buy or sell securities of any kind, nor is it any form of contract or commitment.
- Relevant intended users have a clear understanding of the risks of the deep link project. Once investors participate in the investment, they understand and accept the risk of the project, and are willing to personally bear all corresponding results or consequences.
- The project team will not bear any direct or indirect asset losses caused by participating in the deep chain project.
- Project risk:

➢ Policy risk: Blockchain technology is an early stage. Countries will have ambiguous regulatory policies for blockchain projects. The project may have changes in operational entities and operations management government.

- Volatility risk: The token of the blockchain project is not a legal currency, but a kind of TOKEN in a blockchain project, and the price fluctuates up and down, requiring investors to have a certain mental capacity;
- Technical risk: For evolving blockchain technologies, there is no guarantee of avoiding technological loopholes and hacking attacks in project operations;
- Team risk: It cannot guarantee that the core personnel will be left behind due to stress, physical and personal factors in the development of deep physical chain. It can be ensured that the replacement of the team will definitely make the project more stable development.