

TeaChain

TeaChain White Paper

TeaChain Foundation

Preamble

At present, in the Internet era, people's collaboration and communication have broken through the limitations of time and space, and the world has become a whole interactive platform. The new form of economic and social development of the "Internet + traditional industries" provides a broad network platform for the reform, innovation and development of all walks of life.

After "Internet Plus", the information age has now reached the stage of "connectedness", which means the Internet of Things (IoT) era, where IoT technology has two meanings: firstly, the core and foundation of the IoT remain the Internet, a network that extends and expands upon the Internet; secondly, its client side extends and expends to any item, exchanging information and communicating, which represents things to things.

However, all stages, from the Internet, to "Internet Plus", to IoT, have failed to address the localization of information dissemination (centrality). Under the current centralized structure of the IoT, it is difficult to achieve truly autonomous collaboration and effective transactions. This is because the parties involved in such collaboration and transactions often belong to different interest groups with complex and difficult to determine trust relationships. As a result, current IoT devices can only be collaborated and traded under the same trust domain; which are that the devices must be provided or authenticated by the same IoT operating service provider, which greatly reduces the true business value of IoT applications.

Therefore, we propose to introduce blockchain technology into the IoT to solve the various problems caused by centralization in the application scenarios of the IoT. Blockchain is a decentralized transaction record storage technology. It is based on the principle of cryptography, with a distributed peer-to-peer network, to achieve orderly transaction records of permanent storage, can not be deleted or tampered with, open and traceable. Thus, it is recognized as the only choice to meet the above challenges. Based on this, "blockchain + IoT" technology brings the idea of multi-pronged collaboration, which will have a profound impact on the governance and operation of the business community.

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1.Abstract

TeaChain is a landing application ecosystem based on "Blockchain + Internet of Things (IoT)" technology, which is committed to building an all-round, full life cycle, cross-industry blockchain application solution, realizing industry-wide integration of the production, processing, transportation and sales of tea, so that all players in the tea industry can achieve information intercommunication and share the credible value of blockchain.

The vision of the TeaChain is to positively respond to the instructions of President Xi for the development of the blockchain industry, hoping to use blockchain technology to improve the collaborative efficiency of the tea industry, build a trusted system, and clear the roots of the tea industry. At the same time, we spare no effort to explore innovative models to solve the pain points of the tea industry, and expect to create a supply chain financial system to provide participants in the tea industry with highly liquid funds to promote the development of the industry.

The construction of application scenarios and the design of product functions of TeaChain always serve the sustainable development of the industry and provide actual business value. The direction of our long-term efforts in the future will be that how to iterate our "blockchain + IoT" technology according to actual business scenarios, and even the introduction of big data analysis, artificial intelligence, 5G and other technologies, etc.

We hope to use the underlying technology of the blockchain to achieve true anti-counterfeit traceability and open up the information sharing of all aspects of the supply chain. In addition, the introduction of the token economy boosts tea companies' product sales, aggregates industry resources, and allows customers to have high quality enjoyment and a brand new experience. While we are committed to applying the technology on the ground in the tea industry, we will also establish a supervision system, open platform data supervision, verification and analysis rights for everyone. We aim to achieve a truly decentralized community, and make the various roles in the ecology work together to become a community of interest.

2. Current Status and Trends in the Tea Industry

2.1 Current status of the industry

More than 2 billion people are passionate about tea worldwide, nearly 60 countries grow tea, and over 100 countries and regions are in the habit of consuming tea. Those make the tea industry a big international market. China has always been a big tea-drinking country, and many regions are with a very strong tea culture.

According to the latest China Tea Industry Development Report 2018 released by the China Tea Distribution Association, China's tea production jumped to the top in the world in 2018, accounting for 45% of global production. However, due to various factors, the annual sales growth of Chinese tea decreased by 1.05% year-on-year in 2018. According to the statistics published by the Prospective Industry Research Institute, China Tea Industry Production, Sales, Demand and Investment Forecast Analysis Report, from 2013 to 2018, the average compound annual growth rate of domestic tea production was 6.29% respectively, while the average compound annual growth rate of domestic tea consumption during this period was only 5.97%.

As can be seen from the chart below, each year, the tea industry has basically appeared more production than sales, which leads to the oversupply situation. What's more, according to the agricultural sector rough data, in the next 2-3 years, the tea industry will enter the tea production period, when the tea production or will usher in the peak. If that is the case, how to improve the sales of tea will be the problem faced

by the entire industry.

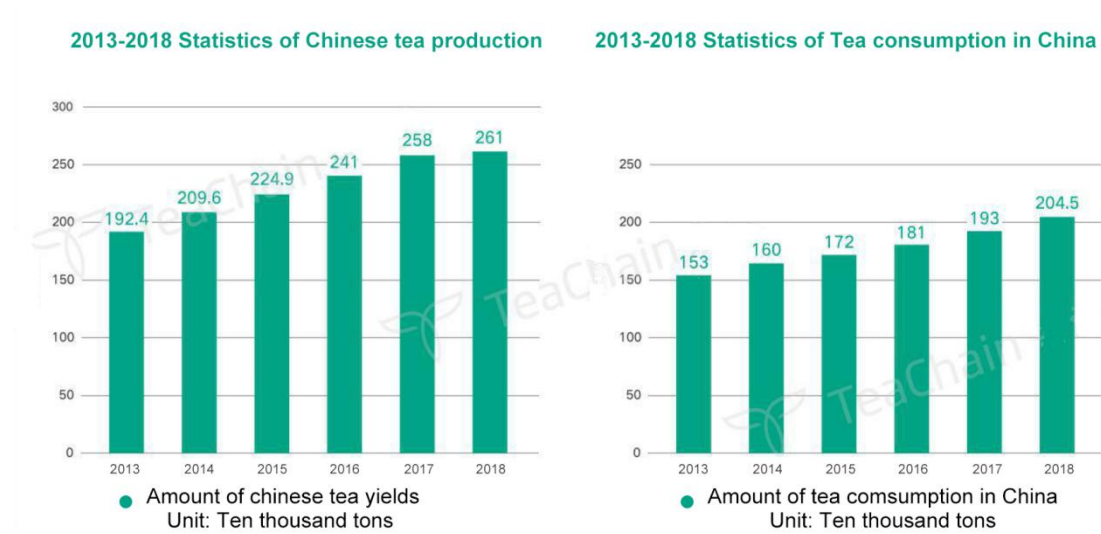


Figure 2.1 China Tea Production and Marketing Statistics 2013-2018

2.2 Industry trends

● Diversification of tea consumption demands

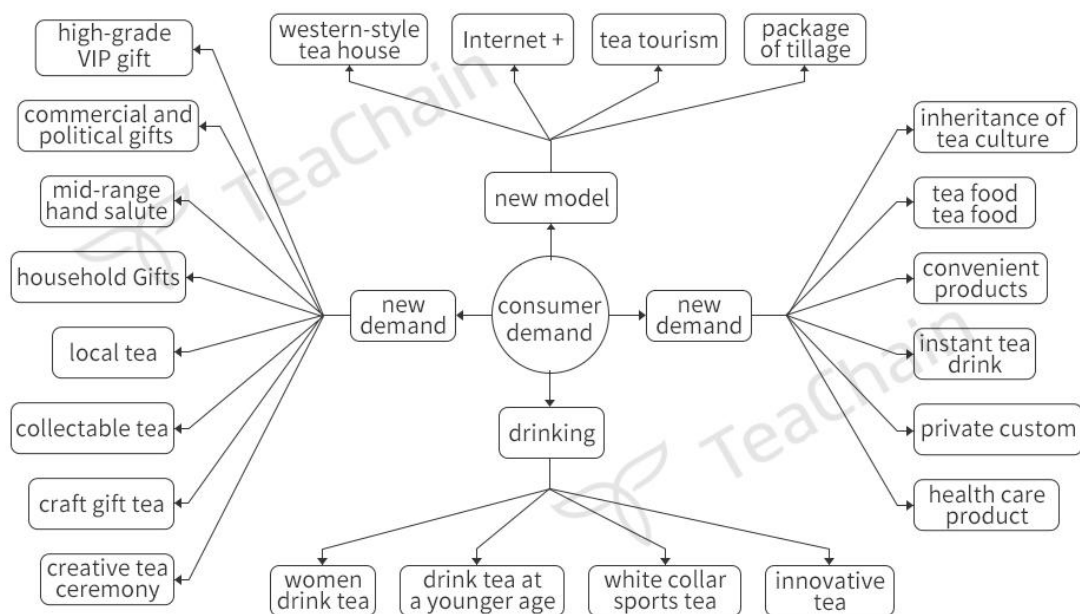


Figure 2.2 Differentiation of consumer demands in the tea industry

With the main consumer group of tea spreading from middle-aged and elderly men to various groups of people, diversified consumption concept has become the new trend of tea consumption. The development of innovative products and new tea derivatives will further meet the ever-diversifying consumer demands.

- **Branding is a top priority**

Consumers are becoming more and more concerned about the quality and safety of tea, and most of them are now buying branded tea instead of non-branded tea. Brand content is becoming more important, and brands that are perceived by consumers as distinctive and unique will emerge. As shown in the chart below, branding is a crucial factor in consumer choice in a survey.

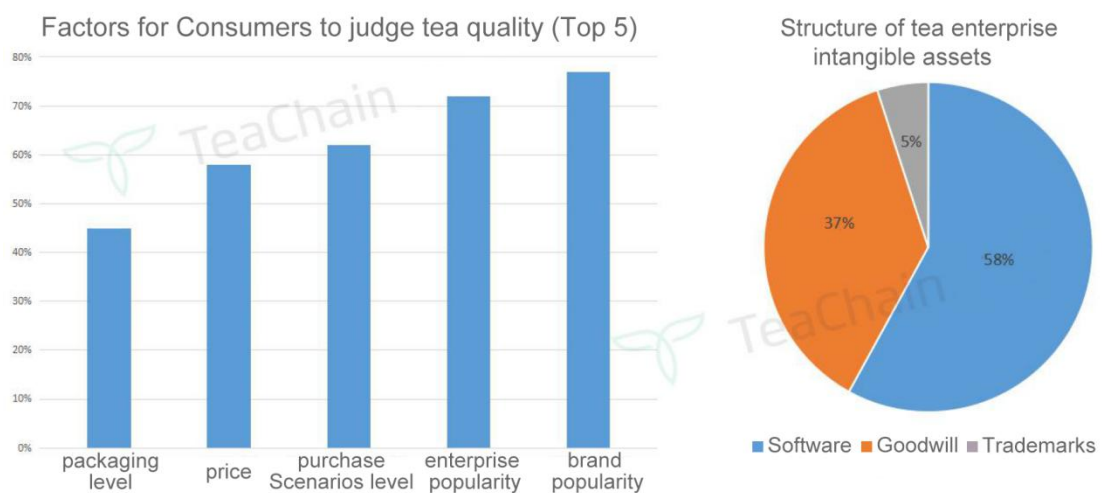


Figure 2.3 Consumers value brands

2.3 Industry pain points

Based on our team's many years of experience in the tea industry, we have identified the following issues in the tea industry:

- **Market chaos and rampant counterfeiting**

Many consumers would like to buy tea from a place of origin. For example, Wuyi Yanchoolong tea (Wuyi Mountain rock tea), a rock and a rhyme is formed in the environment of the mountains where it grows, terrain, air, light, water, soil, surrounding vegetation and other factors, all closely related to the taste of the finished tea. However, in today's tea market, it is difficult for consumers to avoid "imitation tea" and buy authentic "tea of origin". Nowadays, all kinds of fake tea sellers play with some well-known brand signboard, almost rampant trafficking of fake tea, which makes many brands' images seriously damaged. Moreover, many tea-selling routines even make many consumers appear aversion, such as "tea-selling girls", such a label continues to impact the market, resulting in the consumer trust crisis.

There are numerous and scattered brands in the tea market, and the top 100 tea enterprise brands' market share accounts for only less than 10%. Consumers can not choose from a wide variety of brands, and also can not get true and effective tea product information with strong product endorsement. As a result, the inherently fragmented market coupled with rampant counterfeiting makes trial and error cost very expensive for consumers, and that results in the situation where tea companies are also constrained from selling due to consumers' fear. Especially for the really high grade tea, because most consumers have not tried it, they dare not spend a lot of money to buy high grade tea. Because once they buy fake tea, the loss will be heavy. A more serious problem is that many fake teas are much cheaper than the genuine

ones, so when consumers are unable to distinguish between the genuine and the fake, they will most likely to buy the fake teas, which seriously jeopardizes the interests of the tea companies.

- **Information asymmetry for upstream and downstream**

In the tea industry, the lack of transparency of information between various upstream and downstream entities leads to the situation where many downstream enterprises are unable to choose the optimal upstream suppliers. In this way, the production process of upstream tea producers can not be supervised, which can not produce healthy competition within the upstream industry, so that the quality of tea can not be guaranteed. In addition, the upstream tea producers are unable to identify their own advantages and disadvantages. Thus, in terms of production structure, the entire tea production cannot be professionally segmented so that each variety of tea is uniformly made by the best producers. At the same time, the lack of transparency of information makes it impossible to centralize the formation of big data on consumers, which makes it impossible for tea sellers to make optimal purchase plans. Therefore, the only way to improve the efficiency of the entire industry and optimize production capacity is to integrate industry data so that sellers can make sophisticated purchase plans that meet market demand, and producers can segment each type of tea.

The asymmetry of information affects not only the production and marketing processes, but also the tea gardens and the tea farmers. Without feedback from consumer data, the cultivation of tea is never matched with consumer demands.

Moreover, the asymmetry of information has left the tea farmers with unsolved marketing problems. Conversely, many producers are unable to find suppliers of quality raw materials, leaving tea farmers and tea enterprises with varying degrees of wasted capacity, and thus, there is an urgent need to optimize capacity.

- **Lack of good models to create a closed loop for community of interest**

The lack of a good model in today's tea industry makes it impossible for tea companies to target the true core customer base of the tea market and to effectively expand their customer base. Tea sellers have been putting in effort to spread channels, but no one is really doing the work of aggregating resources and integrating channels, so as not to form a systematic analysis of customer pain points. Therefore, the relevant facilities have not followed up, resulting in all tea consumption scenarios only being limited to the tea table.

The tea industry chain also lacks an effective supply chain financial system, making the various players lack highly liquid funds. Therefore, the current tea industry chain is a one-way chain, the link between individuals only exists in the two adjacent subjects, unable to form a closed-loop community of interests including all individuals.

3. Solutions

To address the above pain points in the tea industry, we are introducing a solution with blockchain at its core. Of course, the underlying technology of TeaChain is more than just the distributed storage and cryptography of the blockchain, but also includes network communication, chip technology, economics, etc.

The application of blockchain technology in the supply chain will solve long-standing pain points and provide a new perspective on industrial economics. Therefore, we hope that the customers and partners of TeaChain can better understand the value of blockchain applications and cooperate with us to build a new ecology for the tea industry.

So how will the solutions we offer revolutionize the tea industry?

- **Provide blockchain technology-enabled anti-counterfeit traceability system**

The TeaChain team will provide a complete anti-counterfeiting traceability system, which has been proven and widely used in the market. This system will monitor and control the whole cycle of tea production, circulation and consumption to achieve traceability of origin, destination and responsibility, so as to ensure maximum consumer interests and minimize consumer worries, which allow consumers to enjoy authentic good tea from the origin. Meanwhile, it can also assist enterprises, organizations and institutions in the development of traceability standards and jointly create industry standards.

Due to the increasing demand of consumers for tea quality, traditional traceability technology has the problems of data center, easy tampering, and the inability to share data in circulation. However, the decentralized, public ledger, non-tamperable and traceable characteristics of blockchain technology can empower the anti-counterfeiting traceability system. Therefore, the TeaChain will introduce blockchain technology to empower the anti-counterfeit traceability system, thus eliminating consumers' questions and doubts about the data. Since all the data are collected by the hardware devices at the source and transmitted to the chain, no tea enterprise can tamper with the data on the chain. The vision of TeaChain is to use this complete and mature anti-counterfeit traceability system to clean up the chaotic market, solve the trust crisis for consumers, enable consumers drink good tea and real tea at ease, and also make a strong endorsement for the brands of tea enterprises.

- **Unify ledgers and integrate resources**

The anti-counterfeit traceability system empowered by blockchain technology, with data stored in a unified ledger, enables multiple subjects in the tea industry to closely connect and share data, solving the problem of information silos between upstream and downstream subjects and enhancing the efficiency of the entire industry. It is to provide consumer data for the tea farmers and tea enterprises, as well as to provide the tea market supply data to optimize the production capacity of tea farmers and tea enterprises.

The decentralized nature of the blockchain can turn the TeaChain community into a

"Dazhong Review" of the tea industry, where consumers can rate various types of tea after tasting them. The international nature of blockchain is able to attract a large number of overseas users for domestic tea products. In addition, the blockchain community can also provide a highly liquid price standard for expensive tea. Creating a content-rich community for consumers and providing users with the best quality information are the visions of TeaChain.

Based on the anti-counterfeit traceability system of TeaChain, the end-to-end information management of the retail supply chain will be completed. By establishing a blockchain underlying anti-counterfeit traceability platform for data collection, storage and display in retail mode, online and offline smart retail will be achieved and the sales platform of TeaChain can be empowered. With a strong endorsement, using the characteristics of the blockchain community, TeaChain is able to unite major tea enterprises to penetrate the smart retail system and anti-counterfeit traceability system into online shopping malls and offline stores to provide high-quality tea purchasing channels. While integrating resources, some of the inefficient offline sales are replaced by efficient online sales forms to provide the best quality sales service to customers and also help tea companies effectively strengthen their brands.

- **Token economy stimulates ecological development**

Blockchain can endorse trust between individuals in supply chain finance, and token economy can solve cash flow problems for tea companies and distributors. At the same time, the incentive model of the token economy can maximize customer

consumption, meet the various demands of consumers, drive the sales of tea to meet consumer demands while locking the core customer base on the platform.

In the TeaChain ecology, token economy is more of a tool to provide consumers with consumer rebates. While not affecting consumers' normal tasting of various types of tea, it allows consumers to get discounts. The TeaChain team takes the initiative to allow the consumers enjoy returns and reward the users with the corresponding promotion fees for the platform.

The token economy will also be used throughout the TeaChain ecosystem for more applications, such as tea brewing machines, tea auction center and so on, which we will explain in details in the rest of the white paper. We are not just satisfied with our current goals, but in the ongoing operation of TeaChain, we will create more token economy applications with the joint efforts of our team and community.

4. Underlying Technology of the TeaChain

4.1 Anti-counterfeit traceability system

We will use the anti-counterfeit traceability system with independent intellectual property rights, which has been put into use to realize the whole process monitoring and control from tea planting, picking, inspection, processing, stock-in, stock-out, logistics, distribution and retailing, to truly achieve the whole process traceability of tea from "tea garden" to "tea table", and upload the traceability information in real time in the meanwhile.



Figure 4.1 Anti-counterfeit traceability system

- ◆ **Planting Stage:** install cameras, temperature and humidity light intensity sensors, wind speed sensors, wind direction sensors, rain gauges, soil PH value, soil TH value, PM2.5PM10, pest detection lights, and Bluetooth check-in devices for detecting tea growing environment.
- ◆ **Picking Inspection:** install measurement cameras and Bluetooth check-in devices, record picking time, deliver fresh leaves picked to the laboratory for testing, and they are used for the analysis of its composition, to ensure that the tea is natural and pollution-free.
- ◆ **Processing Stage:** install cameras, temperature and humidity light intensity sensors, PM2.5PM10 sensors, air sensors to detect and ensure the appropriate environmental indicators of tea processing, and paste the label on the tea box for anti-counterfeit traceability.
- ◆ **Warehousing and Logistics Stages:** Cameras, air sensors, temperature and humidity sensors are installed to ensure a suitable environment for the storage and transportation of tea leaves, and the self-developed RFID chip and system are used for the inventory and sorting of tea leaves to achieve intelligent storage and create a standardized storage system.
- ◆ **Retail Consumption Phase:** build smart stores, install cameras, screens, with RFID readers, smart shelves and other facilities, when consumers choose any tea, the system will automatically read the real-time information of the tea selected, display the information on the screen, while consumers can read the real-time dynamic information of the tea through NFC, QR code and other information, as

well as information on the chain.

4.2 System architecture design

Unlike other blockchain projects, we fully recognize that many aspects of blockchain in terms of performance, scalability, ease of use, functional completeness, etc. are yet to be perfected, and blockchain technology still needs to be constantly iterated and improved. Therefore, we propose a more reasonable approach: the application layer business system is the main focus, taking the underlying technology iteration and upgrade as a supplement, and gradually enriching the application scenarios of the tea industry chain.

We divide the technical implementation of TeaChain into four layers: application layer, platform layer, transmission layer and sensory layer. The application layer is the blockchain+application of each link in the tea industry chain, the platform layer is the middle layer of the TeaChain ecosystem that uses blockchain for data transmission, storage, fidelity and query, the transmission layer is the link for data uploading, and the sensory layer is the ecological data collection layer. We hope to empower innovation for the tea industry chain through this four-layer architecture design.

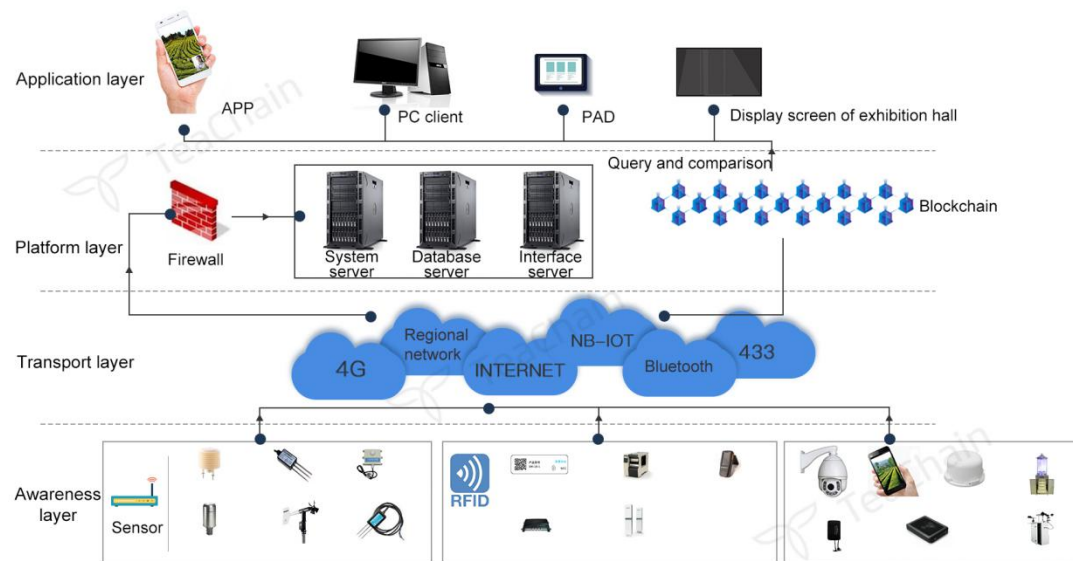


Figure 4.2 System Topology Diagram

4.2.1 Application layer

At this stage, users will be able to use our system applications in a variety of devices such as mobile apps, PC client sides, PADs and showroom displays. These applications will not only run through the entire TeaChain's anti-counterfeit traceability system, but also support the original offline smart retail system and online mall system. As the ecosystem continues to evolve, it will support various decentralized applications of blockchain to enrich the user base of the TeaChain ecosystem.

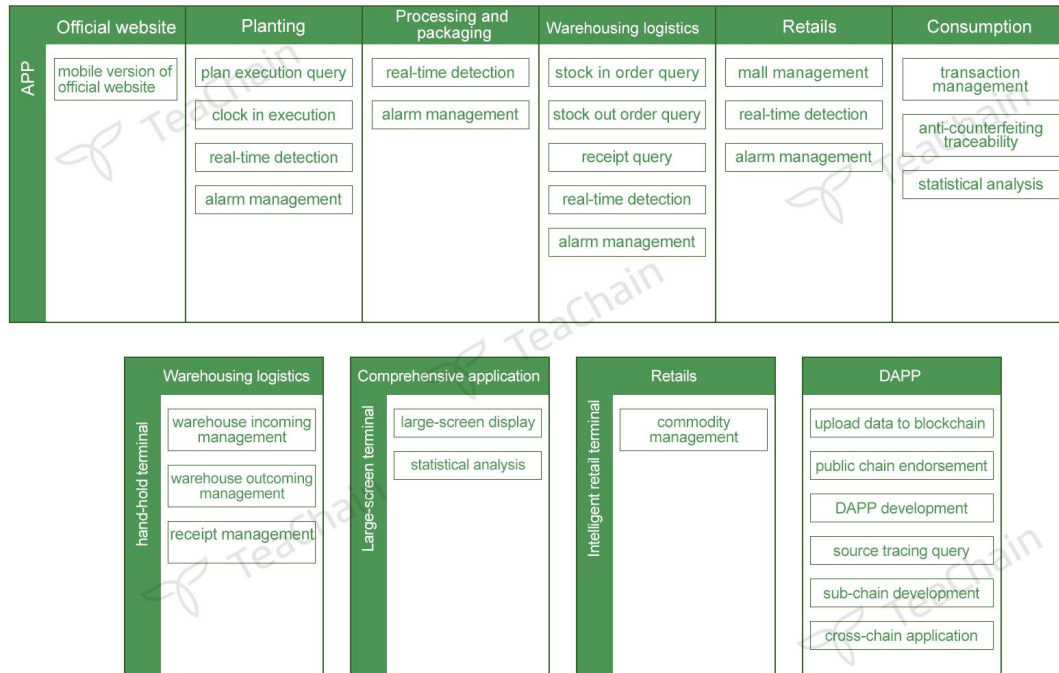


Figure 4.3 Application Layer Structure

4.2.2 Platform layer (blockchain)

In this layer of architecture, we will use blockchain technology architecture to provide account, authentication, database, asynchronous communication and scheduling of large-scale applications. In this layer, we will use the public chain as the base layer and the super ledger Fabric technology as the data carrying platform, to extract the block hashes on the Fabric chain to the underlying public chain at regular intervals, so that the fact that the data on the Fabric chain has not been tampered with can be proved. Thus, we meet the requirements of low latency and high concurrency in real application scenarios, and make the security and authenticity of data endorsed by the blockchain technology.

Consensus mechanism

The consensus mechanism is an algorithmic mechanism unique to distributed application systems. TeaChain's blockchain system will use an innovative blockchain consensus algorithm: POC (Proof of Consumption)-DPoS (Delegated Proof-of-Stake).

Based on the traditional DPoS consensus mechanism, we add a unique chip verification mechanism to achieve a node system that meets ecological requirements for consumption mining. In this consensus mechanism, we will introduce the concepts of super nodes and light nodes: in the DPoS consensus mechanism, token holders of the whole network can choose block producers, which mean super nodes, through the voting system, and the super nodes will be responsible for the production and broadcasting of blocks, as well as getting block rewards in the meanwhile. This consensus mechanism allows for miniaturization of network costs on one side, and on the other allows each shareholder to have some voting rights to participate in the ecology.

Under the BFT-DPOS mechanism, block production will proceed in three steps: firstly, the order of producers is randomly assigned; secondly, blocks produced out of order are invalid; and thirdly, the original order is disrupted by shuffling the blocks every cycle. All mining pools are rotated every three seconds and others have been placed in a subsequent process. This means that there is no competition between producers for block production, but rather a cooperative relationship, and no blocks are missed, so that one block is steadily timed out. In this way, compared to the POW and POS

consensus mechanisms, the period of consensus reached under the DPoS mechanism is much shorter and the probability of forking is also much lower. Under this consensus mechanism, the TPS supported by the blockchain system will reach 1000+, which can provide a smooth user experience for the DAPP and complex business scenarios of the TeaChain ecosystem.

We want to integrate the TeaChain business with the node system and make them tighter. Thus, we will use a chip verification mechanism that will enable consumers to be verified and rewarded with a token after using a tea brewing machine to brew their tea. Every time when a consumer uses our tea, they can be verified with the tea brewing machine provided by us. The TeaChain super nodes will not only be responsible for production blocks and transaction validation, but will also record the consumption mining verification behavior of the light nodes and implement the logic at the contract level to allocate the light node rewards, which will come from the consumption mining part of the TeaChain token.

Super node

All TeaChain users will be able to participate in a decentralized voting mechanism. Fifteen super nodes are elected from the alternate nodes through democratic and fair voting. The super nodes must, in turn, provide relevant computing and network resources to ensure the proper functioning of the nodes. The super nodes have the right to produce blocks, and after validating the transactions, they will be packaged into blocks and broadcast to the whole network, while other nodes will add the new

blocks to their own database after validation.

In the TeaChain blockchain system, the super node will not only be responsible for the output of blocks, but also act as a centralized server to document the consumption verification data uploaded by the light node, then implementing the business logic of consumption mining through smart contracts.

In the ecological development, we will be committed to promoting the TeaChain and tea enterprises. All tea enterprises that recognize the TeaChain ecosystem will have the opportunity to become the super nodes of the TeaChain, which means to become the core components of the TeaChain blockchain system, maintaining the security of the blockchain system and protecting the integrity of the data.

However, the number of super nodes can be flexible and is not permanent. Therefore, when the number of super nodes is not sufficient for the development of the project, the community can initiate a vote to increase the number of super nodes. Similarly, the number of super nodes can be reduced based on community agreement.

Light node

Light nodes are mainly responsible for logging physical events in the actual business, and will also be responsible for client connections, local cryptographic operations, key management and other responsibilities. Each light node will transmit the authenticated data to all super nodes, and when more than $\frac{2}{3}$ of the super nodes authenticate successfully, the smart contract mechanism will be triggered

automatically. Therefore, the data generated by the light nodes will not circulate in the chain and will only stay at the contract level.

In the early stage of the ecosystem, we will create light nodes of the TeaChain in the form of a tea brewing machine, combined with practical application scenarios. Each consumer will be able to become a light node, a link in the TeaChain system. Consumers can use the tea eggs and the chips on the tea machine to identify and verify consumption behaviors when using the tea brewing machine provided by us. After verification, the data is transmitted in real time to super nodes across the network, which will execute subsequent smart contracts after unified verifications.

As the ecology evolves, we will come up with more ideas to diversify the light nodes.

Smart contract

The TeaChain will support Turing-complete smart contract, which is on-chain coding logic that can be automatically executed in the TeaChain to enable realistic and complex applications on the blockchain. The contract will include business logic, node entry and exit, and changes to system configuration, etc. Through programming, the smart contract can negotiate the terms of the agreement, automatically validate and perform, and enforce the agreed upon terms, all without having to go through a central organization for approval.

After the consumption behavior data verified by the tea machine is verified by the super nodes, the reward allocation will be executed by the smart contract set up in

advance. In more real-world scenarios in the future, the light node's reward allocation will be mostly performed by smart contract.

Cross-chain

Today, there are many excellent blockchain projects that are constantly exploring the underlying homogeneous cross-chain technology, and we are also committed to creating an underlying technology that is more in line with practical applications. In the TeaChain traceability system, the data sensed by hardware devices will be transmitted to the Fabric chain in real time, and at the same time, the data features will be used to extract the hash fingerprint or index stored in the Fabric chain to the underlying main chain, which is convenient for searching data in the future. Through our cross-chain indexing mechanism, we can quickly find the required data, and through cross-chain technology, we can quickly verify its authenticity to prevent the possibility of the hardware device sensing data being tampered with in the Fabric chain.

4.2.3 Transmission layer

The transmission layer will be responsible for uploading the IoT data from the underlying hardware devices to the blockchain, which will be using mature 4G technology, Bluetooth technology, LAN technology, etc. at this stage. We will keep abreast of the latest 5G technology, and our next step will be to integrate mature 5G technology into our TeaChain technology system.

4.2.4 Sensory layer (hardware device)

In this layer, we will design different hardware devices for sense acquisition of IoT data based on different application scenarios.

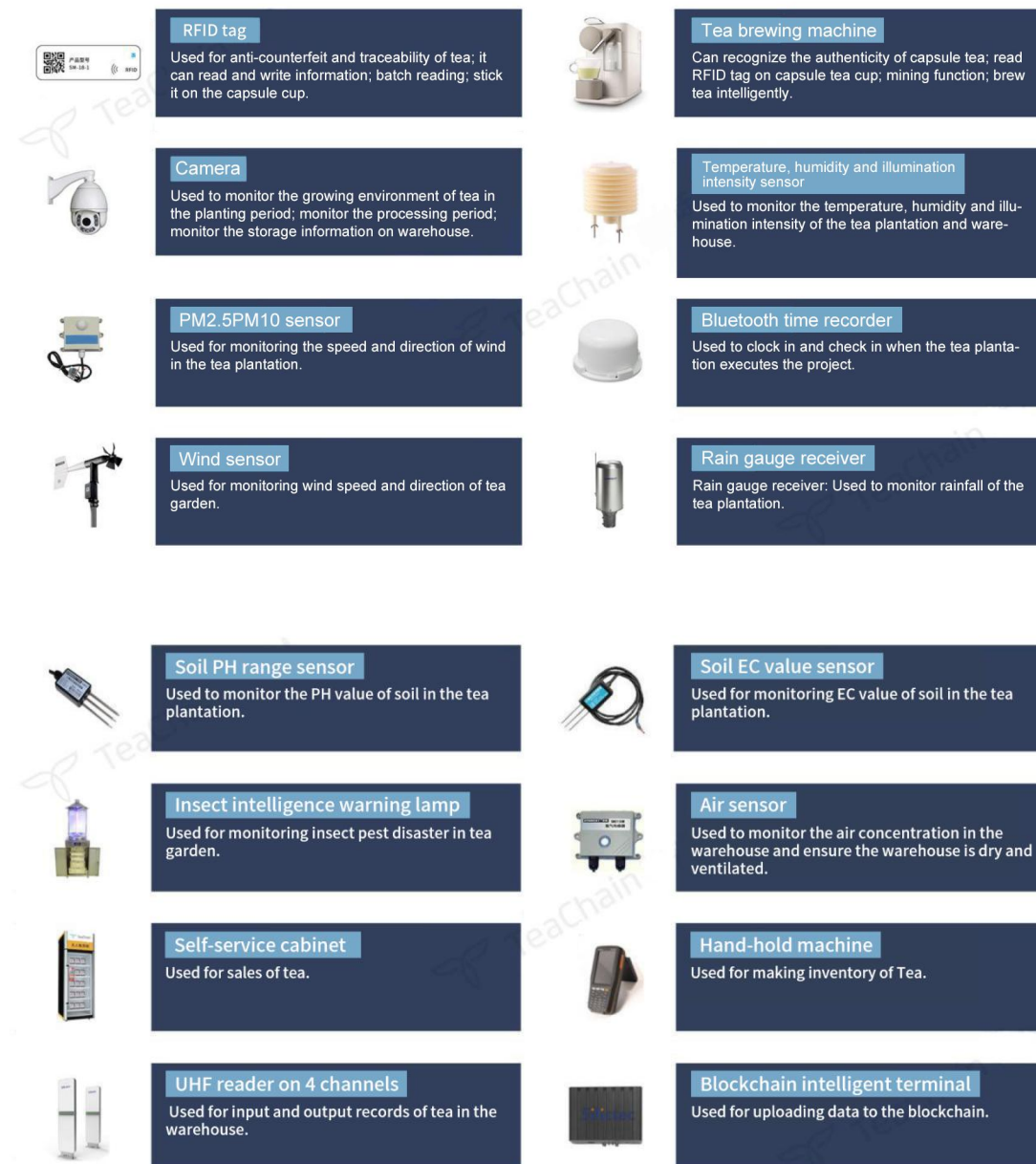


Figure 4.4 Hardware devices of sensory layer

The hardware devices at the sensory layer will be equipped with our successfully

developed blockchain chips. We have innovatively integrated an elliptic curve encryption and decryption acceleration module based on our existing chip technology, as well as a communication interface protocol suitable for blockchain technology applications. Based on this, we have designed a blockchain chip with the following significant advantages:

- ◆ **High Security:** The chip integrates asymmetric random cipher pair generation logic, adopts the core asymmetric encryption algorithm with independent intellectual property rights, and optimizes the design to make communication more secure and data untamperable without increasing the cost and power consumption of the chip;
- ◆ **Optimized Anti-collision Design:** The chip uses a binary tree anti-collision algorithm with independent intellectual property rights and a time-division multiple access design, which significantly improves the success rate of tag identification and the number of identifiable tags at the same time;
- ◆ **High Sensitivity:** The chip adopts optimized noise suppression technology to improve the noise coefficient of the receiving end, improve the overall receiving sensitivity, which plays an important role in improving the recognition success rate; these advantages make the chip have a big advantage for IOT applications;
- ◆ **Good compatibility:** The chip can also realize high-frequency and ultra-high-frequency functions, and end customers can read the information through their smart phones to find out reliable tea information.

Figure 4.5 and Figure 4.6 give the schematic diagram of our developed solution for

the label chip and reader chip, respectively.

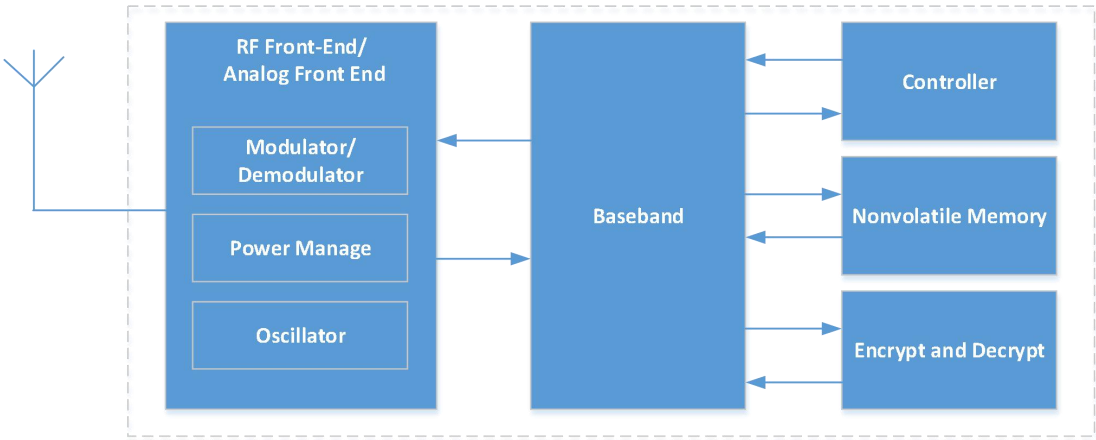


Figure 4.5 Schematic diagram of labeled chip

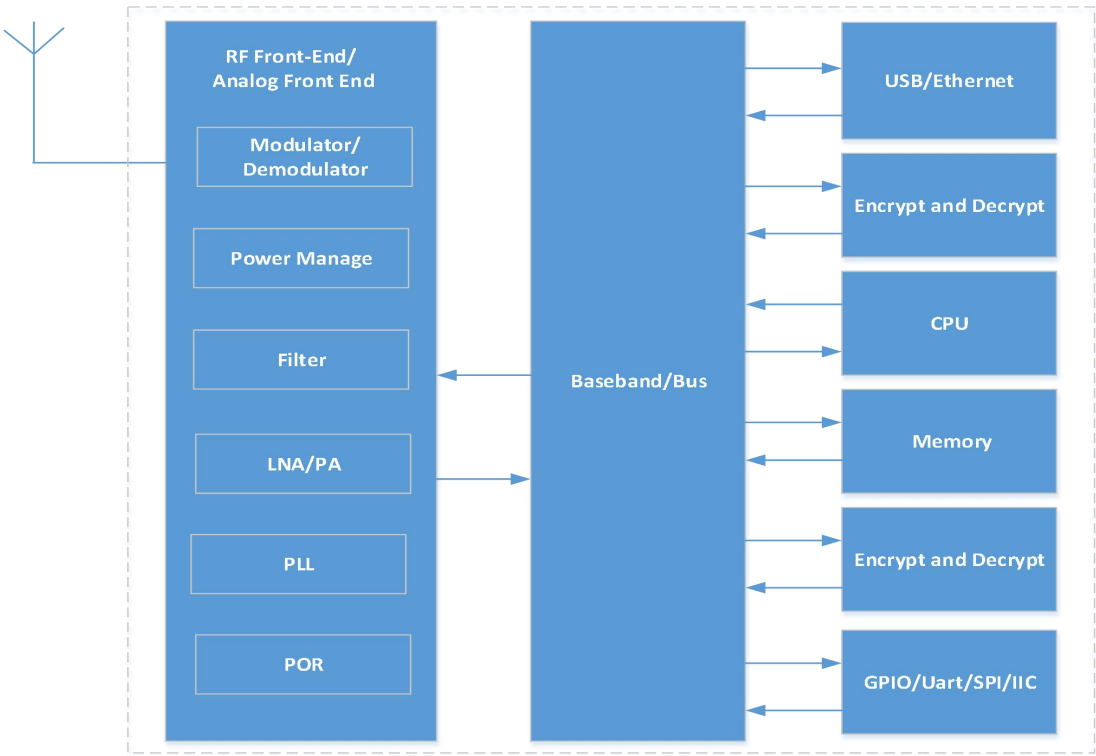


Figure 4.6 Reader chip scheme block diagram

4.3 Smart retail system



Figure 4.7 Online and offline sales scenarios

We will build an integrated online and offline smart retail system in the TeaChain ecosystem, so that consumers can purchase tea in online shopping malls and offline stores, and get anti-counterfeit traceability services. In addition, we will put our original smart sales container in the community, mall, business district, subway station and other areas. Consumers can scan the code to open the container and select tea on site, and they can check the tea traceability information while doing the quick payments.

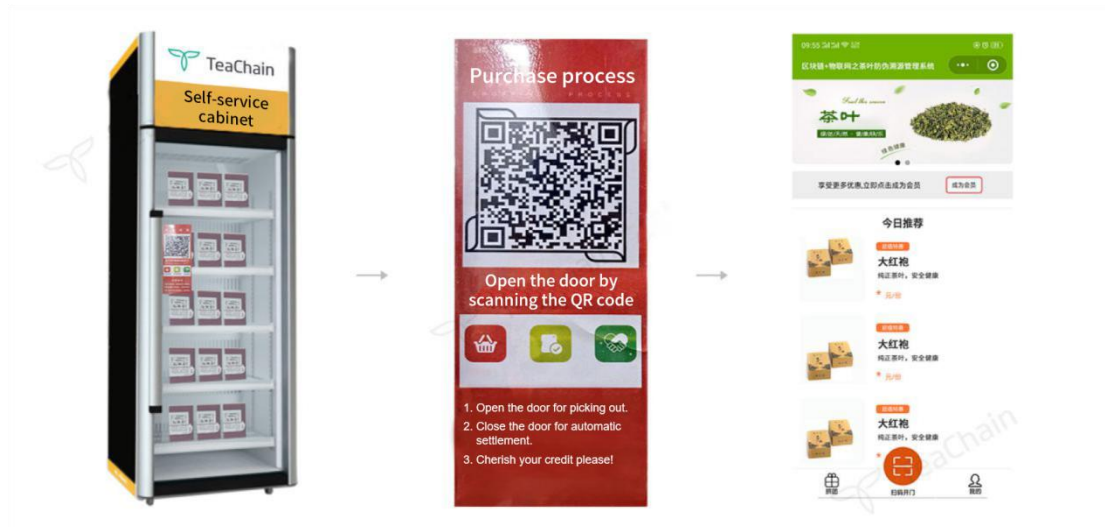


Figure 4.8 Smart sales machine and consumer page

Tea brewing machine

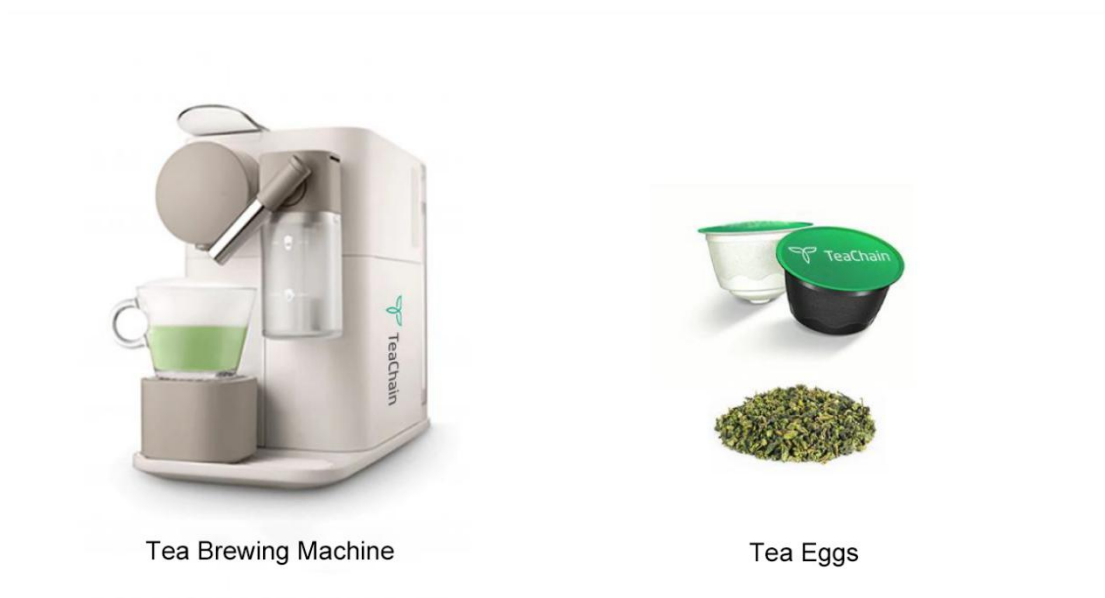


Figure 4.9 Tea brewing machine and tea egg

We will launch our own branded smart tea brewing machine and tea egg and other packaged forms of tea compatible with this tea brewing machine. The tea brewing machine can quickly read and identify the RFID tags on the tea package and the verified events will be confirmed by the hyper nodes linked to it. After confirmation,

mining reward will be given to the tea machine, and this business logic will be implemented in the smart contract. In addition, the tea brewing machine will intelligently identify the type of tea, according to the different types of tea, the development of tea brewing program and fast brewing tea, which is more intelligent and convenient than the traditional tea brewing.

The tea brewing machine can be a light node in the TeaChain blockchain system, so all the tea brewing data will be up to the blockchain. With the popularity of tea brewing machines, tea companies and tea gardens will be able to access valuable consumer data analysis through big data analytics to learn about consumer preferences, habits, regional distribution, etc., based on which better strategic planning can be made. Since many tea purchases are not for the purchaser's own consumption, the only way to accurately conclude the analysis of the much-needed consumption data for tea companies and tea gardens is to obtain data on the final scenario of tea consumption, which is tea brewing.

5. Token Economy

In order to coalesce the various strands in the tea ecosystem into a community of interest, we propose to introduce the token economy into the TeaChain ecosystem to encourage the various players in the chain to participate in the ecosystem.

Therefore, we will issue ecological tokens for the TeaChain throughout the entire ecosystem.

5.1 Overview of token

Name: TeaChain Token

Code: TEA

Form: ERC20 Token (temporary)

5.2 Issuance of token

This is the first time that TEA will be issued in physical asset backed mode and the total number of TEA tokens will be 1 billion. The total value of TEA Token is USD 30 million, and users can exchange TEA token for tea at any time at the TEA token price.

The warehouse where the TEA token is stored will be monitored throughout the entire cycle of the issuance and users will be able to check the status of the warehouse at any time.

5.3 Mining mode

- **Consumption mining**

At the early stage of ecological development, similar to traditional e-commerce, we will sell "anti-counterfeit traceable tea" and at the same time, we will give consumers a certain percentage of TeaChain tokens through the form of points rebate. The details of the relevant scheme will be displayed in the TeaChain mall.

- **DPOS mining**

Under the DPOS consensus mechanism, all nodes on the chain will receive mining revenue. The associated mining incentive scheme will be introduced during the main network testing phase and is expected to open in the fourth quarter of 2020.

5.4 Application of the token economy

- **Tea credit**

During the actual sales process, many tea companies and distributors face the problem of cash flow shortage due to excessive inventory accumulation every year and are unable to purchase new products. We propose a new tool to solve this problem: the token economy. Eco-participants will be able to obtain funds by pledging their tea leaves, which is a short-term solution to the cash flow problem of tea supply chain finance for dealers. At the same time, customers of the tea collection section can choose to buy tea in escrow or repurchase and exit in a flexible mode, which not only

meets the demands of collection and investment, but also solves the sales and liquidity needs of tea enterprises.

● **Tea brewing machine**

In 4.3 above, we introduced the technical mechanics of the tea brewing machine, but the tea brewing machine will go beyond that. We are combining the token economy with the tea brewing machine to form an original token economy application. The tea brewing machine will become the light node of the TeaChain to become a component of the TeaChain ecology and will be available for mining. Users who own a tea brewing machine will be able to enjoy fast and smart tea brewing and get the ecological token rewards of the TeaChain in the meanwhile.

● **Tea auction**

Some of the finished teas have become very costly due to the expensive and rare nature of the original tea tree and the loss of tea frying techniques. At the 7th Wuyishan Red Robe Festival in 2005, the auction price for a 20 gram Wuyishan mother tree robe tea reached RMB 208,000, equivalent to RMB 10.4 million/kg, creating the most expensive tea auction price to date. There are many kinds of expensive teas on the market, such as Pu'er old tea, but bidders do not know the authenticity of the tea, so the tea auction industry urgently needs anti-counterfeiting technology to solve this problem. Therefore, we will provide anti-counterfeiting service for all famous teas to protect the interests of bidders.

We will set up a Tea Auction Center, which will execute the auction of all the famous teas that get the TeaChain anti-counterfeiting service. In addition to this, ordinary tea leaves will also have access to liquid prices, which will be bought and sold in real time through the TeaChain token, providing high liquidity for all tea leaves. The TeaChain Foundation's backed tea assets will provide a strong endorsement for this auction method.

6. Road Map

