Banyan Network

Banyan Network

Ecosystem White Paper

（V1.0）

2018.7

Contents

Preface

Since the release of the Banyan Network's "White Paper" in 2017, the Banyan team has been implementing the promises and plans described in the "White Paper" and has completed a series of major product developments such as the construction of the data connection platform, the beta version of the Mutual Trust Connect, and the access of standardized data sources.

If we think of the "White Paper" as the DNA of the entire Banyan Network, this "Ecosystem White Paper" of the Banyan Network is to decode the DNA into a complete ecological community of big data plus blockchain, using concise language and scenario descriptions to help members of the Banyan Network community (especially those who are not big data practitioners) understand the Banyan Network more intuitively and learn how to participate in the construction and governance of the Banyan Network in the future.

With the development of the Banyan Ecology, and the continuous implementation of new fundamental tools and platform applications, we will update the "Ecology White Paper" from time to time.

1. Analysis of the Data Market

1.1 Overview and Pain Points of the Data Industry

Data is the foundation for the development of the big data industry. Data with business value can help companies with gaining customer insight, digital operations, risk management, precision marketing, forecasting, and decision making. Data with business value and business analytics can help companies improve their business and create value. Particularly, when data from different sources and different dimensions are linked together with cross-mining and analysis, it can lead to a "chemical reaction", creating added value through sharing.

The global big data market is still in an early stage. Many big data companies possess only fragmentary data for which it is difficult to form complete and commercially valuable data sets. There is a big gap between commercial data supply and data demand. The available data is generally isolated, lacking mobility and integration, or is otherwise unable to provide value because it has not been cleaned or processed. With the deepening of data mining and the continuous advancement of its applications in various industries, the “vulnerability” of big data security has become increasingly prominent.

With the advent of the blockchain era, its distributed structure and big data are inextricably linked. Together, the two represent a fundamental future transformation from the centralization of technology authorities' monopoly to decentralization.

At the data source level, the barriers to entry for data acquisition are high, with the data being incomplete, segregated, and close-ended. Each data source can only provide partial information out of the whole; errors in data are large due to a lack of multiple data sources for corrections, and thus it is difficult to guarantee accuracy.

At the data product level, the degree of productization is low; there is no interface standard and data accessibility is low; there are limited solutions for the problems and their effectiveness is questionable.

At the data security level, there is a lack of compliance system, and it is difficult to trace data sources and verify users' pre-authorization.

1.2 Big data + blockchain

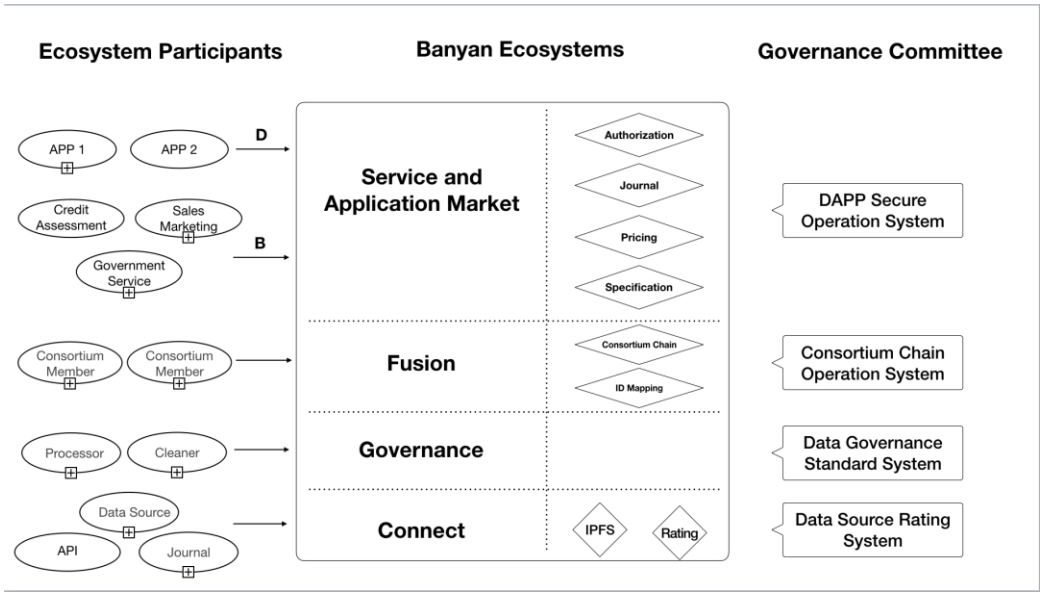

Figure 1.1 Banyan Ecology Framework

One of the core advantages of the decentralized Banyan Network is to establish smart contracts or smart assets through contractual relationships, and the blockchain becomes a universal ledger in the data value chain. The records on the chain ensure that none of the data can be copied, intercepted, precipitated or modified illegally and the value of the data is not weakened by theft, thereby greatly reducing cost for the Banyan Network to establish trust with the data source. Another advantage is to break through geopolitical and temporal constraints and to increase the transparency, extensibility and efficiency of the various parties, resulting in greater data mobility and higher data value.

On top of this, the Banyan Data Network provides basic infrastructure for the artificial intelligence data, meeting almost all the data source

supplies, data service procurement, and high-performance distributed data processing capabilities for its application development, and providing sufficient fuel for the future of artificial intelligence.

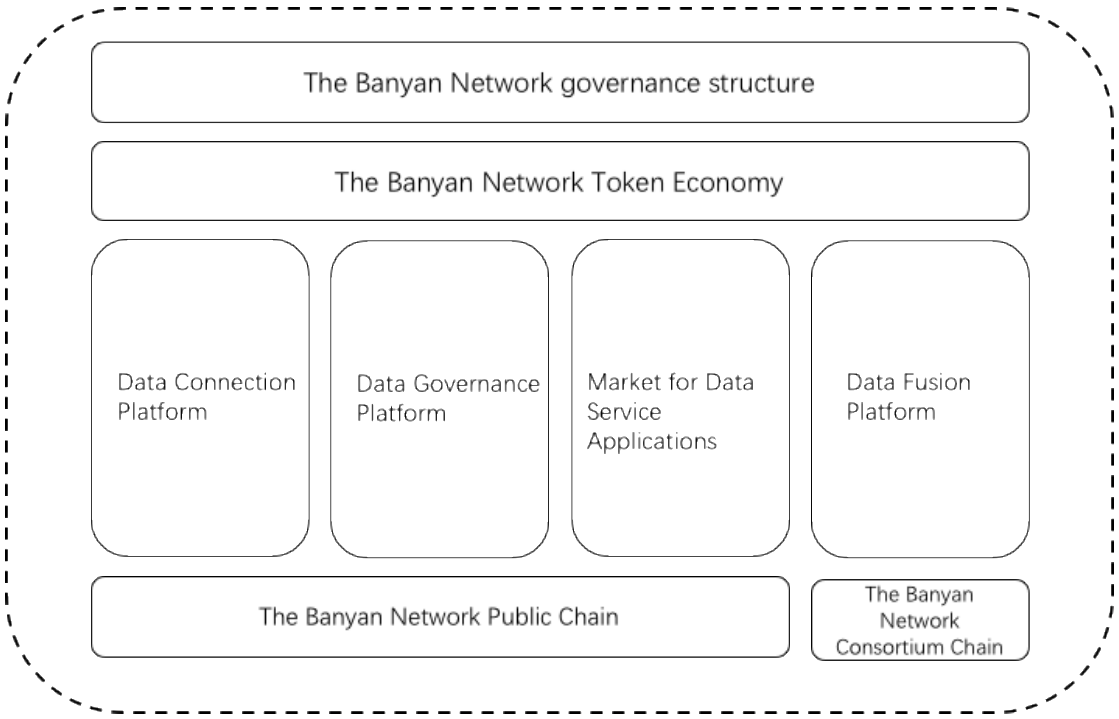

Figure 1.2 Applications on the Banyan Network Chain

We are speeding up on the implementation of the Banyan Network tools and platform while continuously evaluating the applicability of existing underlying public chains to big data scenarios, especially with respect to the smart contracts that support interaction with external data. The Banyan Network will release the results of the underlying public chain assessment in the fourth quarter of 2018 and seek community input to decide whether to invest in the development of vertical public chains for the big data industry.

2. Data Connection Platform

2.1 Data Connection Platform

The data connection platform will integrate all the high-quality data sources in the world to form a one-stop gateway to data network, connecting all the data to build a secure multi-party ecosystem of data fusion services, providing multi-dimensional data insight applications for enterprises with a holographic perspective, and focusing on building the world's best one-stop data ecosystem dedicated to becoming the world's best big data super application service platform.

The data connection platform is driven by big data and blockchain technology, realizing global ID-Mapping through decentralization. It solves business problems from the data perspective and increases customer stickiness for global enterprises by realizing global ID-Mapping.

At present, the data connection platform is open to the public, progressively connecting to the global mainstream data sources and step-by-step accepting some data types including e-commerce data, operator data, government data, financial data, online behavioral data, and other mainstream data sources.

2.2 Platform for the Evaluation of Data Sources

In order to boost the confidence of the accessors and application

parties of the major data sources in using the source data, the Banyan Network will construct a data source evaluation system and upload to the blockchain in real time the rating of the data source that has been incorporated into the evaluation system. The data agent or the data user can view the rating of various data sources in real time and select the data source to access accordingly. The data source can also optimize and improve its data accuracy according to its own rating. The data evaluation system is referred to in Section 4.2.1 Banyan Score of the “White Paper”.

2.2.1 Rating system for standard data sources

From the perspectives of data accuracy, coverage, timeliness, data source performance, etc., an evaluation system is constructed for the scientific and objective rating of data. Taking standardized data sources of the market as targets for the rating, the rating system covers data of major banks, UnionPay data, carrier data, the internet e-commerce data, etc. The Banyan Network will regularly rate various standardized data sources and upload results to the blockchain in a timely manner. The openness and tamper resistance of the data source evaluation system can promote the rigor and standardization in handling data problems by the data source itself, providing scientific and quantifiable metrics for the party accessing quality data sources.

2.2.2 Rating system for non-standardized data sources

In addition to the well-known monopolistic data sources in the data market, there are also various types of crawler data. For these non-standardized data sources, the Banyan Network will also establish a rating system for various non-standardized data sources based on its own data standard, and the results will be regularly uploaded to the chain.

3. Data Governance Platform

3.1 Background

The accuracy of the data value lies in the quality of the data itself. Data cleaning and management has always been a key link in big data applications. Aptly described as “garbage in, garbage out,” only by fully managing the data and eliminating noise can one lay a solid foundation for subsequent data mining and modeling. The data governance platform is referred to in Section 4.2.2 Banyan Wormhole of the “White Paper”.

3.2 Governance Specifications

The Banyan Network provides data participants and communities with a set of specifications and tools for data governance.

Data completeness specification: A specification for the evaluation of a field’s completeness: the formatted data consists of different fields and

the specification defines whether each data field is complete, the proportion of incomplete data fields, whether each data field has a value, the proportion of blank fields, and so on.

Data type specification: every data field can be generalized to define a type, including numeric types, string types, date types, enumeration types, etc. Different types have different formats and content requirements. For example, there should be no characters other than the numerical digits 0~9 for the decimal number type. The date types all have a certain format and the enumeration type must contain limited content, etc. The specification defines the conditions that various data types should satisfy.

Data statistics specification: the specification of the overall numerical distribution, e.g., for the value type the distribution range of the data value and the maximum and the minimum, and for an enumeration type (such as gender) the proportion of each value, etc.: the specification defines the overall statistical dimension of the data.

Community developers can submit specifications to the governance committee and vote through the developer community. If the specification is passed, the developer will receive BBN rewards as an incentive.

3.3 Governance Tools

Data sampling tool: when the data reaches a certain volume, it cannot be evaluated one by one. The data sampling tool will extract the evaluation

samples according to the actual scenario's requirements, based on conditions of random extraction, eigenvalue extraction, interval extraction, and so on.

Data evaluation tool kit: releasing evaluation tools according to the data specification, including stand-alone version, big data platform version, etc.. At the same time, according to the development protocol developed by the specification, community developers can develop and submit their own evaluation tools (including multi-language or multi-platform versions).

3.4 Governance Platform

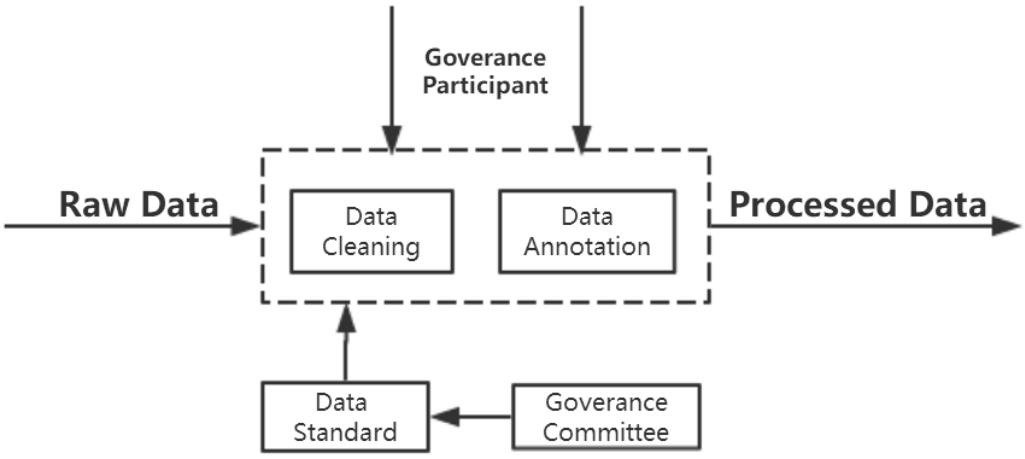

Figure 3.1 Framework for the data governance crowdsourcing platform

The Banyan Network publishes the data governance crowdsourcing platform according to the data governance standard adopted by the community, and the data source can publish the pending data packets on the platform, announcing tasks in the form of crowdsourcing and allowing

the community to participate in the governance.

Scenario 1: data cleaning**.** After the initial formatting of the data, some fields cannot be used directly in the commercial scenario and need to be further cleaned up. When the model algorithm cannot be carried out by the computer, manual intervention is required. In this case, it can be posted to the crowdsourcing platform, and community participants can clean it as required.

Scenario 2: data annotations. The data modeling machine learning process requires a variety of sample data. The samples can be published on the crowdsourcing platform. The platform automatically preprocesses the samples according to the built-in algorithms, reducing manual workload and further optimizing the preprocessing algorithm according to the results of manual annotation.

The data source pays BBNs to the crowdsourcing governance participants. The platform saves the results of data governance to the blockchain to ensure the interests of all parties.

At present, the platform is in the first test phase, and one of the scenarios is the text segmentation for the customer service system of e-commerce clients.

As shown in the following figure: Figure 3.2 shows the initial text input to the annotation platform. Figure 3.3 shows the platform performing text segmentation using natural semantic segmentation algorithms, but the text segmentation is purely algorithmic preprocessing and may not be suitable for business scenarios, so the manual annotation of Figure 3.4 is required, e.g., obtaining a dimension of the product problem by putting together a sentence of "cannot hear the other party's voice when making a call".

Figure 3.2 Raw data

Figure 3.3 Pre-processing results by the built-in platform algorithm

Figure 3.4 Results of manual annotation by the data annotator

3.5 The Use of Blockchain

Various data of the data governance platform such as the results of data evaluation and annotation will be stored on the blockchain. Due to performance limitations of the current public chain, the result data will not be saved directly to the public chain; instead the data will be saved to the

IPFS, and the Peer hash will be saved to the public chain through the Merkle Tree structure.

4. Data Fusion Platform

4.1 Overview

The Banyan Consortium Chain is based on the blockchain technology of the Banyan Network's underlying architecture. It is designed for data fusion scenarios and matches the requirements for multi-party collaboration, creating an integrated solution covering the architecture, tools, governance, operation and maintenance of big data. Its goals are:

（1）Faster construction of a trusted data network

The Banyan Consortium Chain supports tiered storage, tamper resistance, privacy protection, smart contracts, etc. by deploying blockchain Peers and bridges across the entities, and it could solve cross-entity trust problems faster with technical means.

（2）Greater encouragement for data sharing

The Peers of the Banyan Consortium Chain are equal and are jointly maintained, based on maintaining the data participation rules and incentive mechanisms, so that each Peer entity actively participates in contributing to and maintaining data, providing possibility for data traceability and channel verification.

（3）Deeper promotion of model innovation

The uploaded data on the Banyan Consortium Chain itself has the characteristics of mutual verification by multiple data entities. Commercial transactions based on automatic modes such as the smart contract can greatly reduce the number of data verification links and costs, lowering the transaction risk and increasing certainty, thereby promoting synergy and interoperability of high-value data supply chains on a deeper level.

The Banyan Consortium Chain is more flexible and efficient than the public chain. It is mainly for high-value business-end data partner entities with overlapping and complementary ID systems. It is easier to standardize, modularize, and implement in small-scale and lightweight scenarios.

Based on standardized data services and focused on merging data products, the Banyan Consortium Chain will allow greater operability in transforming the data industry's long-standing modes of traditional centralization and human intervention and further verify the advantages of the combined structure of Banyan’s underlying public chain and the consortium chain.

4.2 Characteristics of the Banyan Consortium Blockchain

The Banyan Consortium Chain is different from the underlying public chain of the Banyan Network in that it has characteristics such as partial decentralization, strong controllability, and fast interaction.

(1) Architecturally, it supports horizontal scaling, dynamic capacity expansion, hot and cold data separation, and multilayer summary storage;

(2) Functionally, it supports user real-name verification, data governance, event-driven collaboration models, etc.;

(3) In terms of security, it supports pluggable password algorithm with a default for multiple and expandable xID devices;

(4) Contractually, it supports reusable smart contracts, multi-language contract debugging, etc.;

(5) In terms of compliance, it supports account authentication, Peer supervision, data filing, etc.;

The Banyan Consortium Chain belongs to all the members, and the Peers are distributed among the members. It is easy to reach a consensus, which is beneficial to the efficient operation and update iteration of the blockchain; the core data is limited to the members and their users according to the permission and visibility settings, which can meet the privacy needs of specific scenarios.

4.3 Constitution of the Banyan Consortium Blockchain

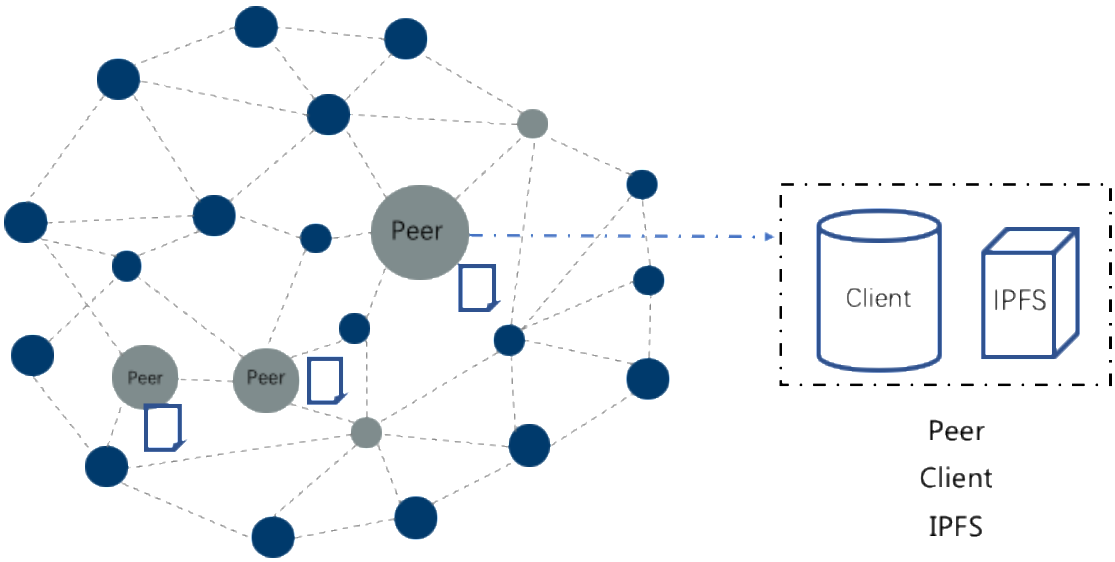

Figure 4.1 Constitution diagram of the Peer, Client, and IPFS

The Banyan Consortium Chain is composed of the participant Peers joining the Banyan Network. Each participant runs one or more Peers, and the consensus process is coordinated by all the participating Peers.

The Banyan Consortium Chain is developed based on Hyperledger-Fabric. The software includes blockchain protocol, component model, service interface, etc., and the hardware includes blockchain Peers, Clients, distributed memory, basic network, etc.

（1）Peer: based on security and fairness, each participating member needs to provide machine Peers to join the Banyan Consortium Chain network. The member joining the Banyan Consortium Chain provides at least one Peer, and the authenticated Peer can be interconnected with other member Peers to synchronize the blockchain ledger information.

（2）Client： to interact with the Peer so as to interact with the

blockchain: Clients and Peers are best deployed on different machines, but one machine can be deployed with a Peer and a Client together.

（3）IPFS: as an introduced storage upgrade scheme, the data summary information is stored, and only the IPFS address of the data summary information is chained. The IPFS Peer is associated with the Client. Each Client is configured with at least one IPFS Peer. An IPFS Peer and the Client can also be deployed on the same machine.

The Banyan Consortium Chain will make public the machine configuration of the Peer and Client, including the general operating system, hardware configuration, Docker, domain name, and port open requirements that meet the standards. The network deployment includes generating a private key and applying for a certificate, deploying a Peer node, deploying an IPFS, and facilitating extended requests such as the participation of Peers in the Banyan Network architecture.

4.4 Data Fusion Mechanism

As a value tool that offers "partial decentralization" at the data fusion level, the Banyan Consortium Chain is open only to members of the consortium and has a strict authentication mechanism. The Banyan Network Consortium Chain makes open to the public the ID-Mapping core technology as a data interaction link between members to achieve data fusion.

The basic process of ID-Mapping can be briefly described as meeting the need for data matching between parties A and B through mutual ID-Mapping based on the shared ID system. The two parties first upload the data to be matched to their respective Clients. The initiator uses the data desensitization algorithm to calculate the data summary and store it in the initiator IPFS. Based on the decentralized sharing of the IPFS, the receiver also obtains the data desensitization algorithm information simultaneously. The data desensitization algorithm is sequentially performed by the two parties and matched until the matching data is consistent, and the resulting shared ID is then obtained, thereby achieving data fusion between the two parties.

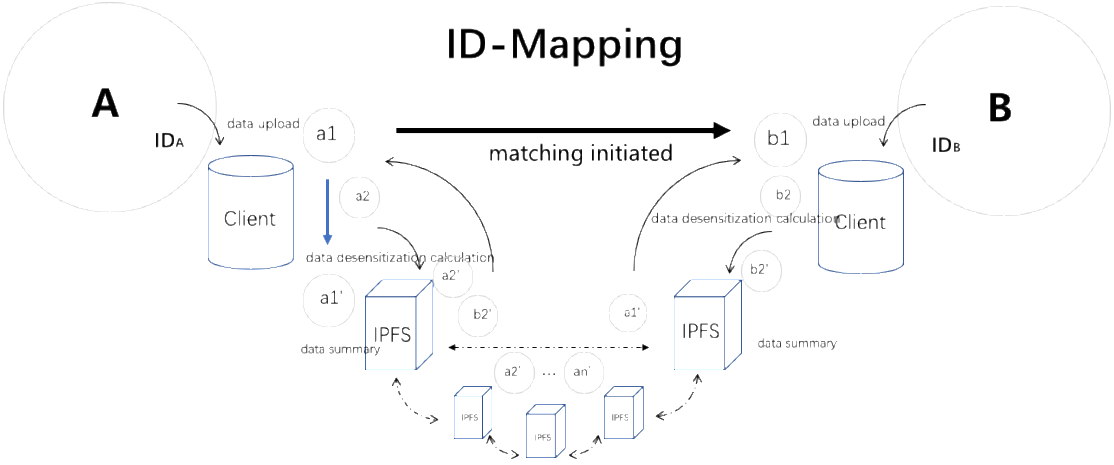

Figure 4.2 Data fusion mechanism based on ID-Mapping

4.5 Token Circulation and Value Building

The unified token system is an important carrier to ensure the efficient operation of the Banyan Consortium Chain. The Banyan Network's token

– the BBN – will play an important role in the multi-party collaboration of the consortium chain. These usage scenarios include but are not limited to:

（1）Consortium chain membership registration and initial credit collateral for participation;

（2）Incentives for good behavioral incentives such as active data delivery, initiation of and response to data matching, etc.;

（3）Reward distribution after the value settlement of the consortium chain data fusion;

（4）Subsidy for resource consumption of the consortium chain Peer accounting;

（5）Voting certificate for items of major decision in the consortium chain.

At the beginning of the construction of the Banyan Consortium Chain, the Banyan Network will inject a certain amount of BBN tokens free of charge as the basic propulsion fuel for the cold boot operation of the consortium chain, packaged into packets of cold boot tokens and distributed directly or randomly, mainly for rewarding new consortium members and coordinators and for promoting good behavior that helps the chain's operation.

4.6 Development Roadmap for Value Fusion

The Banyan Network adopts a two-wheeled architecture of public and

consortium chains to promote efficient and credible flow of value big data. The value collaboration platform of the Banyan Consortium Chain is positioned as standardized and normalized data. Functionally, it focuses on solving the pain points of data fusion, which very much matches the vision for collaborative transformation of many business-end participants in the industry.

The core value of the Banyan Consortium Chain is to provide technical support and program support for the peer-to-peer data fusion system for business-end entities in the data industry. Under the decentralized public chain and weakly centralized consortium chain structure, the Banyan Consortium Chain needs to involve more organizations and collaborate with more business-end entities to overcome the difficulties. Its construction is divided into three stages：

（1）Promotion period: pilot services will be provided to existing consortium organizations and partners in the industry;

（2）Development period: the horizontal expansion and technological evolution for qualified participants will be carried out based on the consortium chain;

（3）Maturity period: it will rely on the consortium chain to grow into the world's largest data fusion consortium network following the principle of open mode and entity expansion.

The Data Security Partner Alliance (DSPA) is a professional partner

organization dedicated to multi-party security. Relying on the close technical collaboration relationship with many members of DSPA, the Banyan Network will establish the first batch of application pilots based on DSPA. The first general framework and the first batch of application tools of the Banyan Consortium Chain will also put an emphasis on responding to DSPA's security compliance requirements, developing in parallel common functions and proprietary features and providing validations for its progressive expansion

5. Market for Data Service Applications

The market for data service applications is referred to in Section 4.2.4 (*Banyan Market)* of the “White Paper”.

5.1 Types of Products and Services

5.1.1 Query Category

The Banyan Network’s standard query system covers big data in major fields such as operators, e-commerce, banking, social security, provident funds, courts, academic qualifications, central bank credit information, etc., with comprehensive data, stable output, and a distributed platform architecture.

5.1.2 Verification Category

The Banyan Network's standard verification system covers multi-dimensional verification and it can realize identity verification, name verification, real name verification for mobile phone numbers in the operator dimension, four-factor cross-validation in the bank card dimension, address location verification, enterprise business verification, etc.. The data is updated in time and verified accurately.

5.1.3 Tagging Category

The integration of multi-dimensional tagging can help create a complete set of portraits, business portraits, and business district portraits to help customers gain insight into the portraits of the scenarios they need. For example, the common third-party institutions have limited verification methods, and they accumulate their own data quite slowly. It is difficult for them to identify listed Internet finance companies. With the comprehensive portrait tagging of the Banyan Market for Data Service Applications, fraudulent parties can be identified in no time. This application is referred to in Section 4.2.4 *(Banyan TagLib)* of the "White Paper".

5.1.4 Rating Category

The Banyan Network's basic rating system has standards, indicator systems, algorithms, and publishing mechanisms to provide public rating services for data products and services. For example, under the market

trend, the Banyan Network has created sub-product lines for sub-sectors, which can be used in business development activities in specific industries, and consumer financial scenarios with customer-level screening requirements, etc., and it covers the direct marketing function of financial services. This application is referred to in Section 4.2.1 *(Banyan Score)* of the “White Paper”.

5.1.5 Behavioral Delineation

Based on the principle of light deployment, small investment, and large return, one could choose specific scenarios and capture the full process offline in real time. Along with individual identification, if you know where the target client is, what he or she likes, or even the category and brand preference, applying all this data to marketing will lead to effects far exceeding the brand's imagination.

5.1.6 Address fencing

Offline data collection in real time, such as SDK data, carrier base station data, offline consumer transaction data, Internet data, etc., enabled by the Banyan Network and global ID-Mapping, the integration of various geographic location data and crowd tags includes not only personal interests and preferences but also income structure, age level, brand label, etc., identifying the user's entire network behavior behind each mobile end, restoring the real user image behind the data in real time.

5.1.7 Behavior monitoring

The Banyan Network captures offline the full process in real time, covering the real active users of the whole network, choosing users based on location + crowd tagging, updating crowd portraits in real time update and restoring real offline scenarios in seconds.

5.1.8 Perceptual Reach

Based on real-time data, scenario triggering is performed through certain rules of data monitoring, reaching the target audience in seconds by one click, integrating the closed data, remarketing and re-precipitating for fine operation.

5.2 Applications of the Innovative Blockchain Technologies

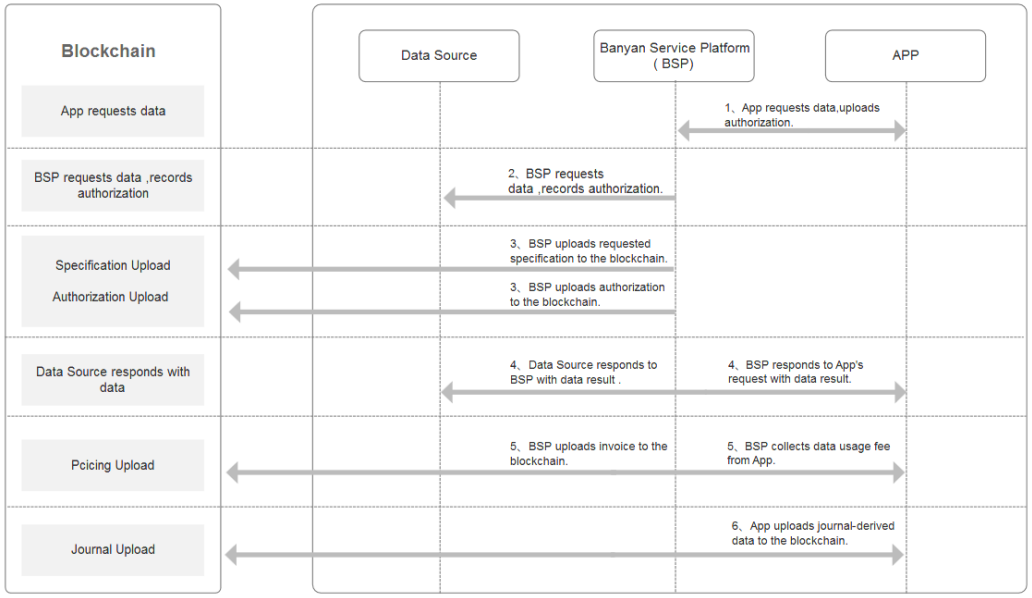

Figure 5.2 Workflow of the Banyan Network Service Application Market

5.2.1 Innovative Licensing Model

To meet the security compliance requirements of GDPR, the Banyan Network launched the Mutual Trust Connect product to ensure that each data call is authorized by the user. According to the privacy level set by the data source interface, authorization policies and services of different security levels are provided. The file hash encryption is written to the chain in real time for customer inspection. It can effectively prevent data transfers and data calls from customers outside the contract.

5.2.2 Open and Transparent Billing Model

The Banyan Network's billing system ensures that the billing generated by each data call is publicly traceable and cannot be tampered with. The customer can clearly see the data source connected to the backend of each data call and the data source's charging policy. Billing can be traced to prevent billing conflicts between the parties after the data has been called through the data agent.

5.2.3 DAPP Closed-Loop Value Data Chaining

The Banyan Network integrates big data technology and blockchain technology to support the lifecycle management of data applications. All the data behaviors throughout the data lifecycle will interact with the Banyan Network by calling APIs, and data such as valuable logs will be written to the blockchain for storage by smart contracts.

5.2.4 Monitoring of the Chaining of Request Parameters

In the process of data request interaction, if an optional request parameter is outputted without verification, the parameter error would be extremely high. At the same time as the request, the Banyan Network will upload the parameters and user to the blockchain in real time, restricting the parameter quality of the requester and the subsequent evaluation of the customer's quality.

6. Token Economy and Governance Structure

6.1 BBN Definition

The US Securities and Exchange Commission and the Swiss FINMA divide the token into three categories: security token, utility token, and equity token. The sales and investment of securities-type tokens are subject to the securities regulations of the Securities and Exchange Commission. The US Securities and Exchange Commission has established guidelines to determine compliance with such financial operations subject to securities regulations.

BBN is a utility token according to the token classification, and its core function is to serve as a medium for value distribution among the participants in the ecosystem.

After the establishment of the Banyan Ecosystem, BBN will be used

for the payment of data products and services within the ecosystem. As a utility token, the biggest component of BBN's intrinsic value is its circulation value. In addition, BBN also represents the right to participate in the governance of the Banyan Ecosystem, providing more diverse support for the price of BBN.

6.2 The Value of BBN

1）Payment of data products and services within the ecosystem (such as the various services and applications listed in Chapter 5, the demand side must pay BBN’s to purchase from the provider);

2）Voting rights in the data governance committee;

3）Creation of the consortium chain, participation fees, and use as internal incentives；

4）Initiation, collateral, and payment for the crowdsourcing platform；

5）Incentives or circulation within a third-party Dapp;

6.3 Model of the Economic Cycle of the BBN

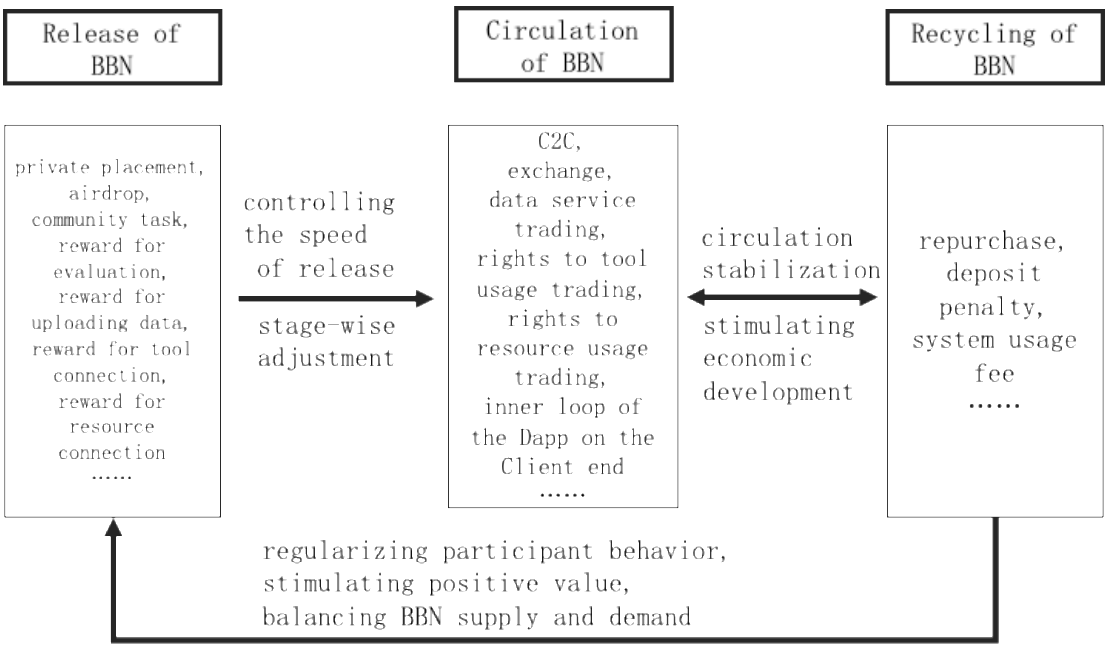

Figure 6.1 The system of the BBN's economic cycle

The release of BBN refers to the issuance of the token from the Banyan Network Foundation account to the investor and the participant's account, in the form of early private placement, airdrops, data-based rewards for uploading to the chain after the establishment of the ecology, tool access rewards, etc.;

The circulation of BBN refers to the provision of BBN used as a medium for the distribution of services, products, resources, etc., in circulation in each other's accounts, for the various participants of the Banyan Network, such as data owners, data service parties, data application parties, big data computing resource providers, etc.;

The recycling of BBN refers to the Banyan Network's governance committee recovering the BBN from the participant account to the Banyan

Foundation account in the form of repurchases, deposit penalties, and usage fees for the Banyan system and the underlying tools, through the development of appropriate governance and regulation rules.

6.4 Governance System of the Banyan Network

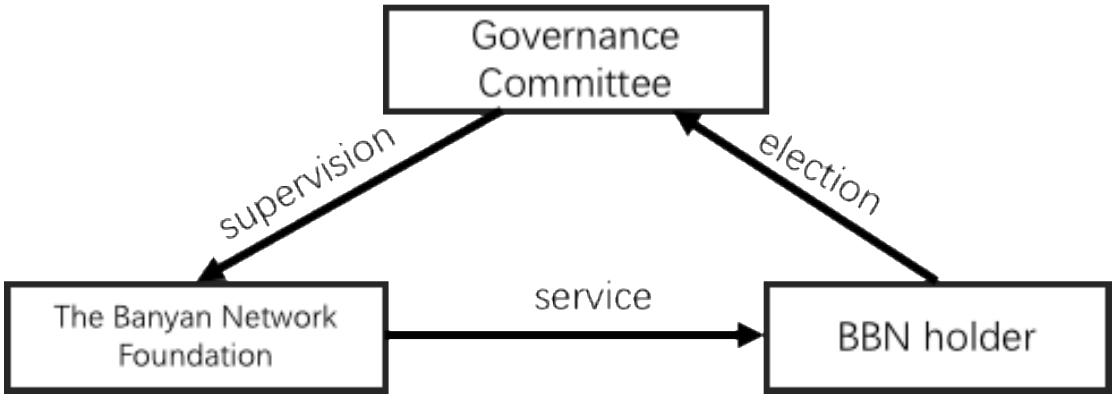

Figure 6.3 Governance structure of the Banyan Ecology

The Banyan Network Foundation： the foundation has the right to nominate candidates for the governance committee and is required to be supervised by the governance committee and to uphold the rules in accordance with the proposals submitted by the governance committee and passed the voting by BBN holders.。

Governance Committee： the committee members are elected through voting by the BBN holders from nominees by the Banyan Network Foundation or registered participants. The committee is responsible for issuing to the community a vote on the rule proposal. The governance committee is composed of big data industry experts, representatives of the Banyan Network community, and representatives of the Banyan Network

Foundation, according to a certain proportion.

BBN Holders： A BBN holder locks in a certain number of BBNs during the voting period and he or she can vote for the governance committee candidates, and the BBN holder has the right to vote on the governance committee's rule proposal, weighted by the amount of BBN’s locked..

Ending

With the progressive establishment and development of the Banyan Ecology, the Banyan Network invites more big data industry stakeholders and blockchain practitioners to participate in the joint construction and co-governance of the Banyan Network to build a future distributed data economy system.

Explanation of Key Terms

Merkle trees： an important data structure of the blockchain with the function to quickly summarize and verify the existence and integrity of block data.。

ID-Mapping： it can connect all the fragmented data in series, eliminating data islands, providing a complete view of the user's information, and enabling the data from one field to bloom in value in another field.

IPFS： the InterPlanetary File System is a network transfer protocol designed to create persistent and distributed storage and shared files.

GDPR： the General Data Protection Regulation issued by the European Union will be officially implemented in 2018. GDPR sets a unified set of laws and stricter rules for the processing of EU citizen data and it also imposes severe penalties for violations.

Official website: http://www.banyanbbt.org/ Telegram chat group：http://t.me/bbnfans

Appendix：”the Banyan Network White Paper”