Dimension Blockchain

Whitepaper

2019

Enterprise-grade Blockchain
Network Service

Dimension

CATALOG

I Philosophy

The blockchain system allows every single movement of digital assets to be to be trackable, at the same time, it also protects participants' privacy. It builds an efficient and reliable value interchange system and accelerates the Internet to become an effective network infrastructure hub for social trust and value transmission, which is called the Internet of Value.

We have noticed that the blockchain service provides a new kind of social trust mechanism and lays the cornerstone for the future digital economy development. The adoption of “Blockchain+” innovation indicates a new direction for innovative industrial and public services.

1.1 Motivation

During the process of seeking adoption, we realized that the blockchain technology services are subject to several restrictions. For example, the scalability has to be improved, the privacy protection is not secured, the distributed file system is not mature, and the decentralized consensus mechanism needs to be refined, and there's no universal and recognized governance standard. In addition, the cross-chain interoperability hits a bottleneck, and it cannot change its consensus algorithm for adapting different services and conditions. The development of blockchain and its deployment are also extremely difficult. All these factors create real obstacles to the progress of blockchain development and commercial adoption.

- The blockchain is composed of a variety of technologies and academics, and with weaknesses such as high learning costs, difficult implementation, and lack of commercial solution. Now, there are still great challenges if we want to let commercial users have a quick understanding of the blockchain and able to choose the right blockchain solution for their business adoption. In the absence of a real sustainable business model, most blockchain adoptions still remained at the concept of ICO stage.

- The blockchain service has to adapt with diversified business needs and satisfy with the network sharing and data security among different enterprise networks, which also requires blockchain solutions to have greater universality. Most of the current blockchain networks only adopt specific consensus algorithms, cryptographic algorithms, account models, and storage types; they are lack of pluggability and cannot adapt to different scenarios.

- On the storage capacity side, since the data of blockchain will be kept forever and not be removed, the size of the data shall only increase. The demand for the data storage of the blockchain will continue increasing as time goes by. This problem is even more serious when the corporate data are stored since they tend to grow exponentially in a short time period. Therefore, how off-chain data should connect with the blockchain network is an important question to answer and a more effective data storage approach needs to be found.

- Many current blockchain solutions do not target to solve real business pain points, and this causes these actual use cases are either lack of real values or impossible to expand

their business sales. Also, they are difficult to adapt to the requirements of rapid business environment change. When it comes to corporate collaboration, the intercompany notification mechanism is particularly important, but not too many blockchain platforms support his function.

1.2 Overview

As being a crucial part of the blockchain development, the blockchain community acts as a great appeal of the project. The community members provide important guidance and suggestion on technology, governance, and sustainable model. The KOLs (key opinion leader), active leaders in the community, also forward their thoughts on various issues such as how to structure a better blockchain network with actual business adoption.

The core leadership of our community comes from different industries and fields, such as a global partner from a well-known blockchain venture capital institution, a global community leader of a top 10 blockchain project, a former Wall Street private equity firm executive, a fintech security consultant, a big data project leaders in financial and IT firms, a system architect in large-scale commercial platforms. With everyone's idea and mutual discussion on questions like how the future blockchain can be, how it can satisfy different business needs, what the governance model would be, how to build a flexible and usable blockchain architecture, and how to implement an adaptive blockchain framework, a final solution and consensus was reached, and it's called "Dimension".

The name of Dimension, from a broad perspective, it is several abstract concepts that interconnected; from a philosophical point of view, it refers to the angle of thought. The project implies a continuous evolution of blockchain technology from multiple angles of the technology: it will start from a commercial application level, then upgrade its value to provide a higher perspective of business insight and application model, which in the end achieves a multi-dimensional interconnection between technology and business. Dimension is committed to building a blockchain distributed service network.

1.3 Vision

Distributed commerce based on blockchain technology is rising on its real-world adoption. It features multi-party equality, intelligent collaboration, value sharing, and transparency. By combining it with blockchain which is open, decentralized, immutable, consistent and anonymous, the distributed commerce can implement the data free flow in heterogeneous and multi-sourced network architecture. The value of data sharing can be enlarged through the restructuring the relations of production. This will form a multi-dimensional connection among nodes and chains, and eventually build a highly complex shared network.

Distributed commerce can have a big imagination, such as adoption in energy management, e-commerce marketplaces, and sharing economies. In the distributed commerce model, each participant can cooperate on an open and transparent basis and earn revenue by their contributions.

Therefore, Dimension will support cross-chain data sharing by implementing decentralized storage system, hybrid consensus mechanism, dynamic node, privacy protection, encryption algorithm and other technologies to support a cross-consensus engine that can be quickly adapted, a cross-chain data interconnection interface, and a rapid deployment release chain. Dimension is committed to interconnecting the business value in blockchain networks and building the next generation of enterprise-grade blockchain network service.

II Dimension

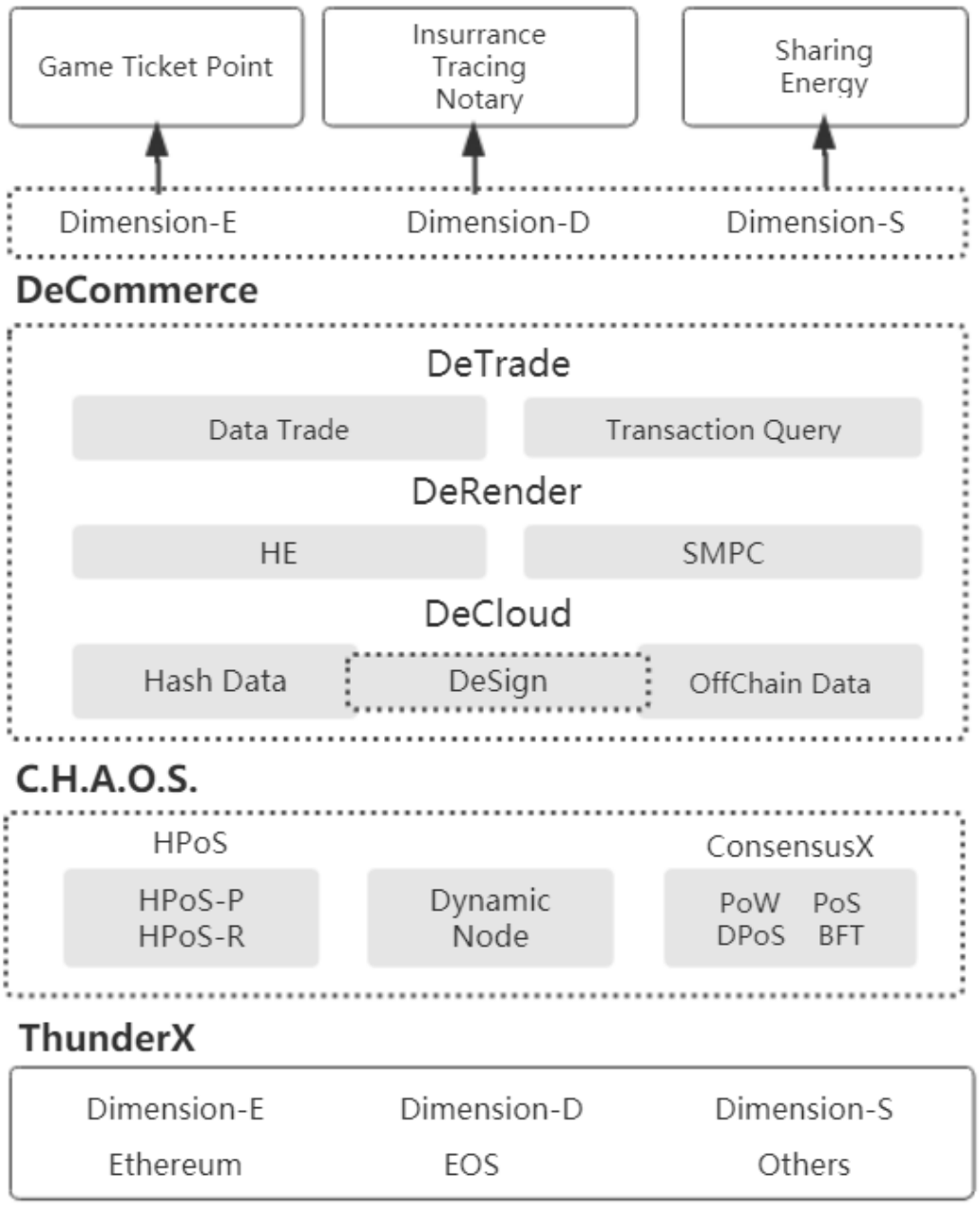


Figure 1. Dimension Architecture

2.1 Economy

Dimension is dedicated to its blockchain governance design, which is an important engine that drives the project and the community, the economic model will have both the repurchase model and the adjustable re-offering mechanism, which can achieve a long-term balance of the project equity value, and at the same time, it can stimulate project iteration and community development in a very important way.

2.1.1 Token Repurchase

Dimension's token repurchase process will reduce the total circulating supply. When the circulating supply goes down, the token value goes up. The Dimension Foundation will repurchase tokens from the community every year, and the tokens will be burnt and destructed. The token burning record will be broadcasted to the network once it's done. The users can check the record through the Dimension's blockchain explorer, and this ensures a transparent and supervised process. The token repurchase and burning processes will continue until exact 600 million DMCT token left.

2.1.2 Token Re-Offering

As the ecosystem grows, the community members, developers, and protocol participants will grow as well. For a stable and smooth project growth, an adjustable incentive mechanism is needed for keeping all participants interested and participated. The participants can receive risk-free incentives through Dimension's token re-offering mechanism. The annual token re-offering amount is 3% of the total circulating supply, and the distribution of re-offering mechanism is as follows:

Rewards for Nodes: 1%
Rewards for Developers: 1.6%
Rewards for Governance: 0.4%

2.2 Technology

Dimension's proposed cross-consensus operating system, C.H.A.O.S., which stands for Cross-Hybrid Automated Operating System, includes three core modules: HPoS, Dynamic Node and ConsensusX. C.H.A.O.S. combines the advantages of different consensus algorithms, and it has the dynamic function to adjust the size of nodes, which can easily adapt the rapid changes for different user networks and allows multiple consensuses algorithms switch in seconds.

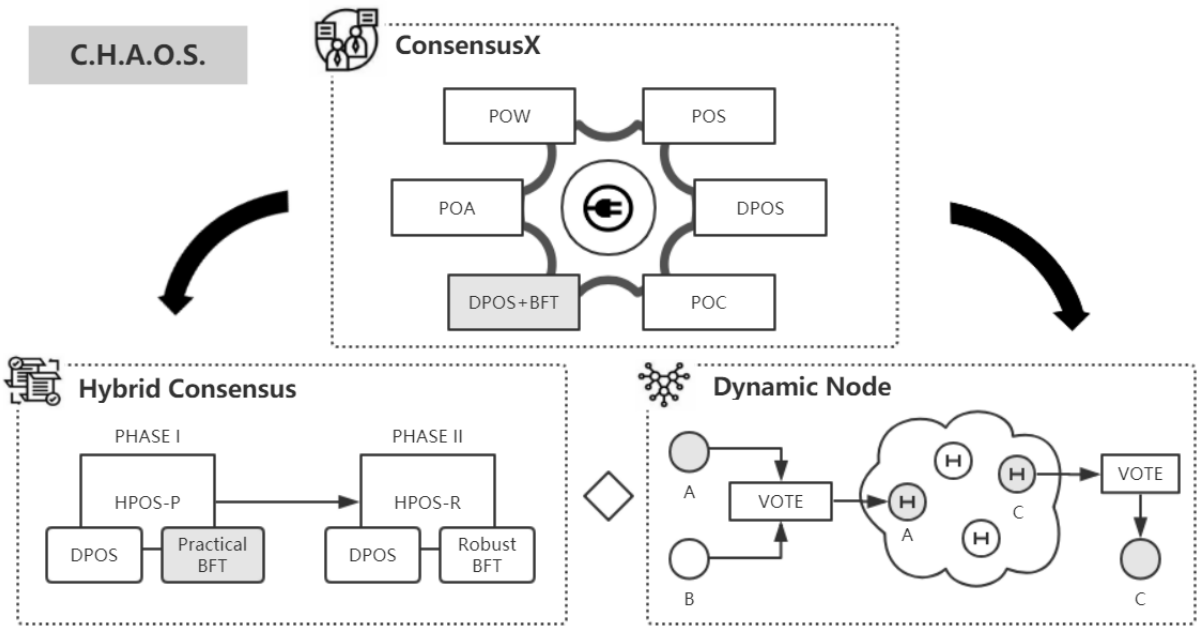


Figure 2. C.H.A.O.S. Framework

2.2.1 HPoS

While analyzing the existing mainstream consensus, one single consensus may be convenient and easy to implement, but there are still many disadvantages in the efficiency and security of block generation. Therefore, a new type of consensus mechanism, Hybrid Proof of Stake (HPoS), is proposed.

HPoS has the advantages of Delegation Proof of Stakes (DPoS), which has both the high speed of validation and high network security, its energy consumption of the entire network is at minimum and the network operation cost is at the lowest.

At the same time, the nodes use the Byzantine BFT algorithm BFT reach a mutual consensus. Any malicious node will be disqualified and given a specific deduction in contribution plus an economic penalty.

The consensus node will then pack the result and the certificate into the block, and other nodes only have to verify the certificate to determine the legitimacy of the block, which can efficiently reduce the time of the block verification and improve the performance.

HPoS enhances the performance and the robustness in a blockchain system, which provides a powerful and economic network infrastructure for enterprise applications.

HPoS will be implemented in two phases, HPoS-P and HPoS-R.

In the first phase, HPoS-P, a PBTF-based consensus mechanism that uses permissioned voting system and majority rules of delegation will be implemented. It also supports Byzantine Fault Tolerance and supervisory nodes participation; this means better access control, higher

performance, and lower energy consumption. HPoS-P can effectively support Dimension to provide a vigorous and stable blockchain network service.

However, the PBFT-based system does not solve the stability problem caused by node failure in some specific scenarios. If a single failed node submits a series of requests, the problematic program or its duplicates may have a serious impact on HPoS-P's availability.

Therefore, in the second phase, the upgraded hybrid consensus design, HPoS-R, will be implemented based on Robust Byzantine Fault Tolerance (RBFT), which further improves the robustness and simplicity of the system.

It will shift the focus of structuring an optimal mounting system that maximizes performance to building a system, which uses RBFT to provide adequate and predictable performance (10K+TPS) and support a wide range of scenarios for enterprise services.

Consensus	Peak Throughput	Faulty Client
PBFT	60982	0
Query/Update Protocol	21873	0
A Hybrid Quorum Protocol	6983	N/A
Zyzzyva Speculative BFT	56287	0
RBFT	**38873**	**38873**

Table 1. BFT-based consensus comparison

2.2.2 Dynamic Node

In the existing blockchain platforms, if there's a new node joining, the old node has to wait and re-modify after the downtime, then the network will take effect after the network reboot. This process is unacceptable for most business scenarios; thus, how to ensure high availability, scalability, and performance is the greatest challenge to commercial blockchain networks.

The quantity adjustment of nodes in Dimension network is implemented by the Dynamic Node mechanism. The Dynamic Node is a validating mechanism based on structuring on-chain authorized delegation and mutual validating vote system among consensus nodes.

The quantity adjustment proposal requires two-thirds votes from existing nodes. The Dimension network will then maintain the entire accounting task after the new adjustment. This dynamic adjustment not only improves the flexibility of the blockchain system, but it also ensures smoother operation of the network, which also reduces costs and avoids potential risks.

2.2.3 ConsensusX

Once a consensus algorithm has to be changed during blockchain operation, in order to adopt a different business scenario, the ConsensusX can immediately switch the original algorithm into others. In the case that DPoS was chosen, the Dynamic Node mechanism could also help with the node's quantity adjustment. This fast and easy pluggability greatly reduces the risk of false algorithm selection in the early stage, and it also provides an efficient, flexible and low-cost blockchain solution for enterprises.

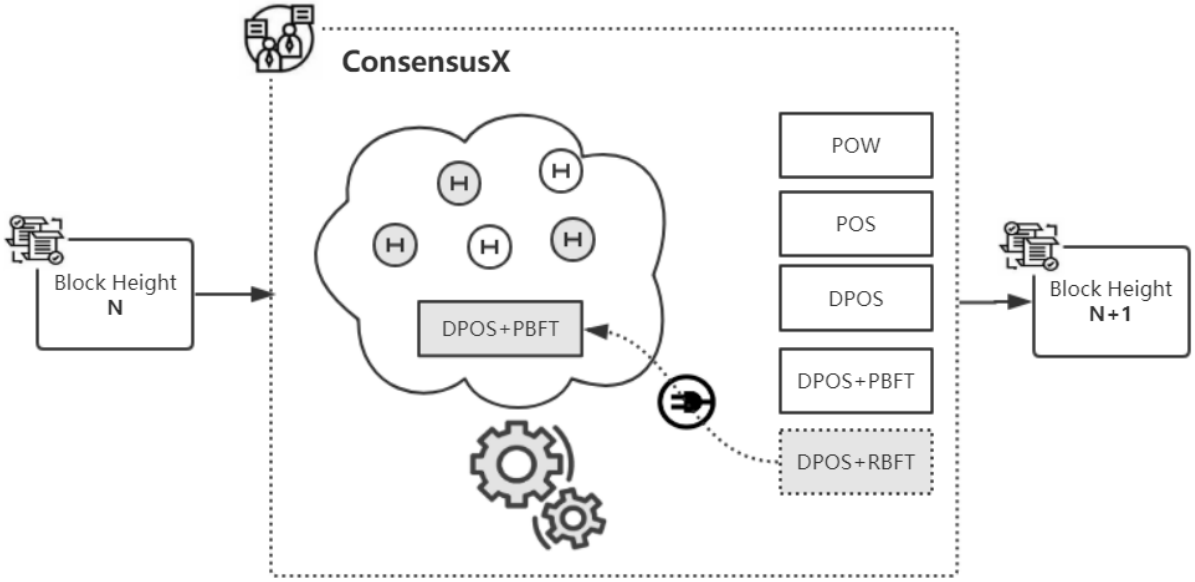


Figure 3. ConsensusX Diagram

2.3 Application

DeCommerce, a decentralized commercial framework, focuses on enterprise-grade decentralized service networks, including the data storage system - DeCloud, the computing framework - DeRender, and the data trading framework - DeTrade, which provides multi-party collaborative participation for business users and ensures the privacy and security of data and transaction.

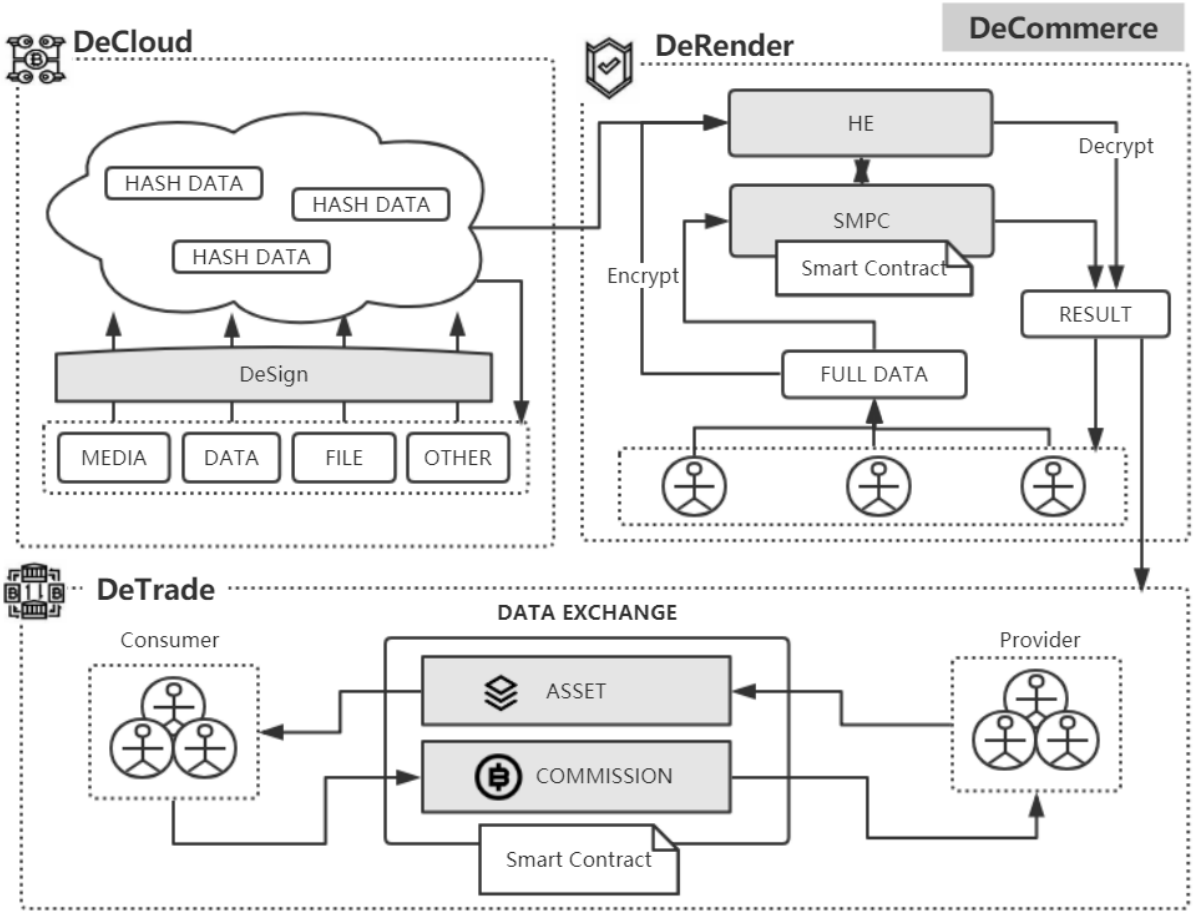


Figure 4. DeCommerce Framework

2.3.1 DeCloud

The decentralized storage system, DeCloud, includes the DHT (distributed hash table) and builds a faster and safer block storage system with a higher throughput of block search. The DeCloud is implemented based on an innovative blockchain storage protocol - DeSign. The packaged data will be heterogeneously processed by DeIPLD and then upload to the DeCloud, and its network will undertake the logic of storage system and P2P retrieval, and facilitate the data interexchange and interoperation among different systems. By using a node-based network, the DeCloud provides the enterprise a better data storage and sharing services, without altering the data ownership and right.

2.3.2 DeSign

The DeSign optimized BitTorrent's P2P data exchange and storage protocol. It obtains data blocks from other files and compute the hash values, as long as the hash value of the data block is the same, the data content must be the same.

The DeSign is far more efficient than BitTorrent since it has a complete incentive mechanism to encourage data sharing. The credit value of a node will drop if it only does data receiving and not sending. Once the node's credit value goes down to a certain point, the node will be ignored by others and kicked out in the end.

2.3.3 DeRender

The decentralized computing framework, DeRender, implement a true privacy calculation by overlaying homomorphic encryption (HE) and secure multi-party computing (SMPC), to ensure the privacy of the input data and the computational logic. Meanwhile, verifiable computation also improves the performance of transaction processing and increases transaction throughput accordingly. The DeRender is scalable, verifiable and privacy-secured. It provides a basic computing framework for data sharing transactions and meets full demand for data privacy and security protection in enterprise-level services.

The homomorphic encryption is a method of performing calculations without prior decryption of encrypted data. Dimension adopts the homomorphic encryption technology to encrypt the data and persist it on DeCloud, then performs complex processing on the specified encrypted data extraction through the smart contract. Only the final result data is decrypted and fed back, and the plain text is displayed. For the data consumer, the user can verify the authenticity and accuracy of the result data through the verification algorithm.

Secure Multi-Party Computation (SMPC) allows multiple users to hold partial data individually, complete the calculation of the full data collaboratively, and it requires each user not to know other user’s data except the final result.

The data holders can share the data privately into DeRender, the decentralized computing framework, and at the same time, authorize DeCloud to access the new data source. When a new computing requirement is initiated, the collaborative computing network, DeRender, will confirm the calculation request, pass the execution code to multiple parties, and give the final result data back for confirmation. The whole process then transmits through a privacy protocol and this implements the collaborative data calculation of each computing node with privacy protection.

2.3.4 DeTrade

DeTrade, a decentralized data trading framework, which establishes a trusted-data asset trading environment without having the risk of data being arbitrarily copied. This protects data owners' legitimate rights and interests, and also promotes the integration of data elements. DeTrade will provide a complete secured privacy strategy for enterprise-level data transaction services that meet the needs of different business scenarios.

DeTrade provides two types of data trading models. The first type is raw data trading. When the data receiver proposes a data request, the message will broadcast to the entire network through DeTrade, and the data source queries the offline database by itself, and if there is matching data, the peer-to-peer data transaction is performed through the smart contract. The second type is data query trading, that is, the data receiver does not care about the data detail, but only needs the data feedback to compute the result, and returns the result set to the receiver according to the smart contract execution code.

In addition, DeTrade is structured on big data and service node, and it can extend its ability to data mining, such as data trend analysis, business intelligence analysis, data intelligent forecasting and network-wide computing power trading, which maximizes DeTrade's performance as a data service network.
Figure 5. DeTrade Diagram

III SideChains

3.1 Dimension-E

Dimension-E solves the problem of data monopoly in the gaming industry by using the three-tier structure system: universal account system, virtual asset trading system and virtual asset monetization system. It ensures the security and transparency of transactions and solves game company's problem of lack of new business models, provides additional values to the virtual assets and helps developers, content providers, distributors, players, and other related parties reach a win-win situation.

The game account system is the most basic service for players when entering the platform. The universal account system will use the game SDK to store game data on the blockchain. Players can anchor the universal account system to save their information, which ensures the system security and improves account privacy. A player's account now becomes privately owned instead of owned by any organization. On the one hand, this system reduces the cost of experience different game; on the other hand, the player can bind any virtual gaming assets with the distributed platform through the universal account. By holding the private key and certificate, players can conveniently manage or transfer their assets to the exchange or the platform.

Dimension-E coordinates with multiple gaming companies to build an external virtual trading platform, and players can open shops on it to sell virtual assets. The platform will satisfy players' demand for game equipment and asset, without excessive interference to the original in-game economy system, and use smart contracts to transfer different assets among different games. The transaction records are transparent, immutable and easy to check. The platform will greatly improve players' gaming experience, protect their interests, and gradually establish an universal game economy.

With the continuous growth of the ecosystem, the platform will enter the third phase of development, namely the monetization of virtual assets. By joining the Dimension-E platform, whether it is in the game industry or others, companies can issue tokens on the platform to monetize their digital assets such as reward points or intellectual properties.

Dimension-E is suitable for business that requires virtual assets, such as industries with loyalty programs, tickets, digital games, animations, or many others.

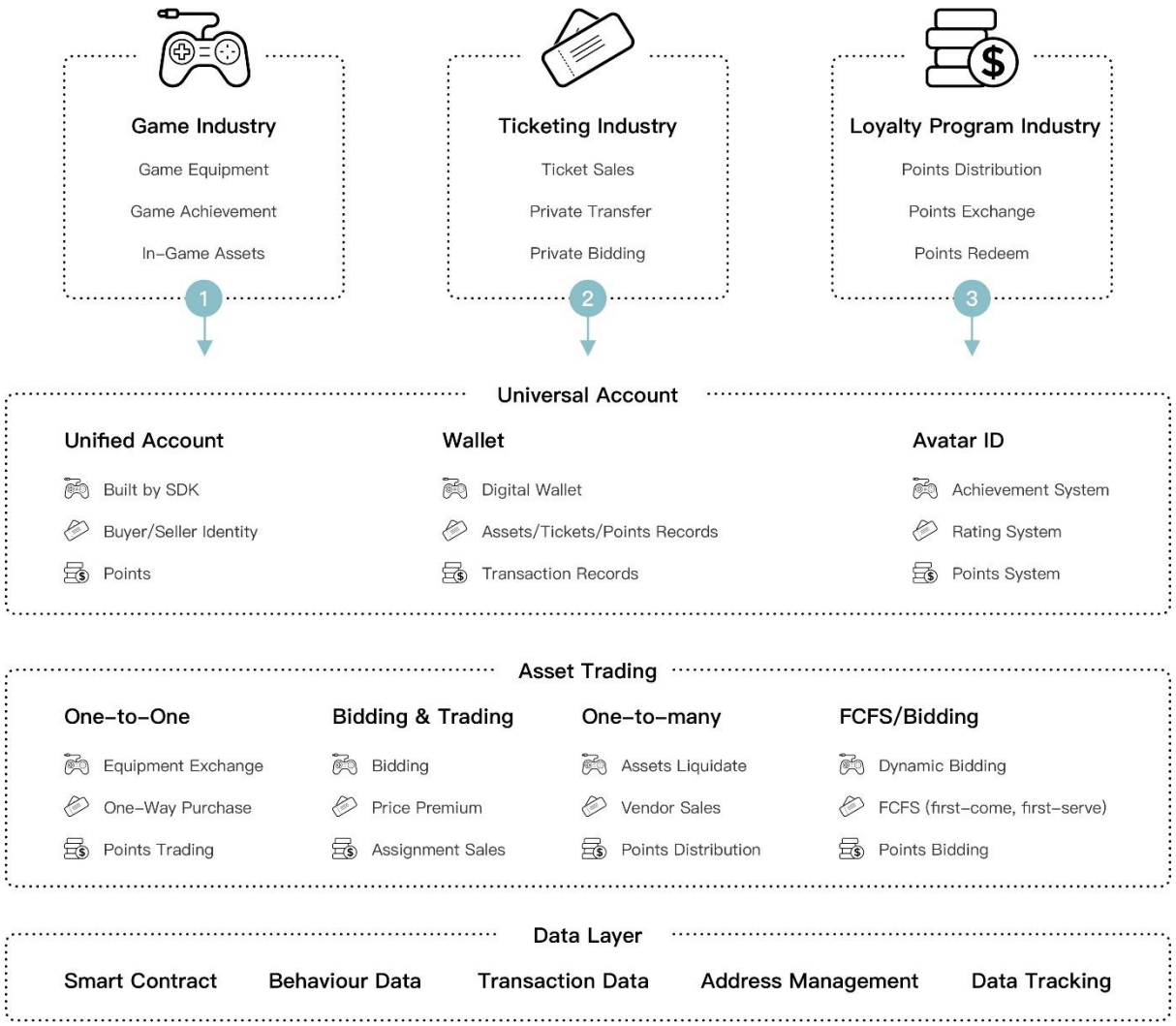


Figure 6. Dimension-E Architecture

3.2 Dimension-D

The most prominent feature of the Internet is the high efficiency and low cost of information processing. Anyone can easily publish, transmit and access various information through the Internet without any restriction of time and place. How to efficiently determine the authenticity and reliability of the interactive information, as well as ensure the immutability of electronic documents, has always been a huge challenge to the Internet.

Dimension-D adopts the blockchain technology to implement the notary system and store the data on-chain. It transforms the arbitrary length of input data into a fixed-length output through the hash algorithm and then performs a length verification algorithm from the original key. Dimension-D eliminates the possibility of data and documents being forged and altered from the source end, and it uses a distributed storage system to process data on-chain which provides easy access.

- Hash Record: Any digital data, such as electronic data, electronic files, contracts, pictures, or works, generates a unique and fixed size of data after hashing, which is called hash values, also known as the digital fingerprint of the data. The content of the original data can’t be figured out by knowing hash values. If there's any change with the original data, a new and unpredictable hash value will be regenerated.

- E-Signature: By using asymmetric encryption technology to encrypt the data with a private key signature, the sender sends the data to the blockchain network. The proof of the data source is undeniable, and the transmission process is immutable.

- Block Production: The data and certificate that sent to the blockchain network will be packaged into blocks after a consensus is reached, and then synchronized with every node in the network for distributed storage.

- Certificate Issuance: When a user needs to prove his stored data, he can contact the corresponding credibility agency to issue a certificate.

Dimension-D is suitable for business that requires data verification, such as notary public, insurance, trust, charity, and others.

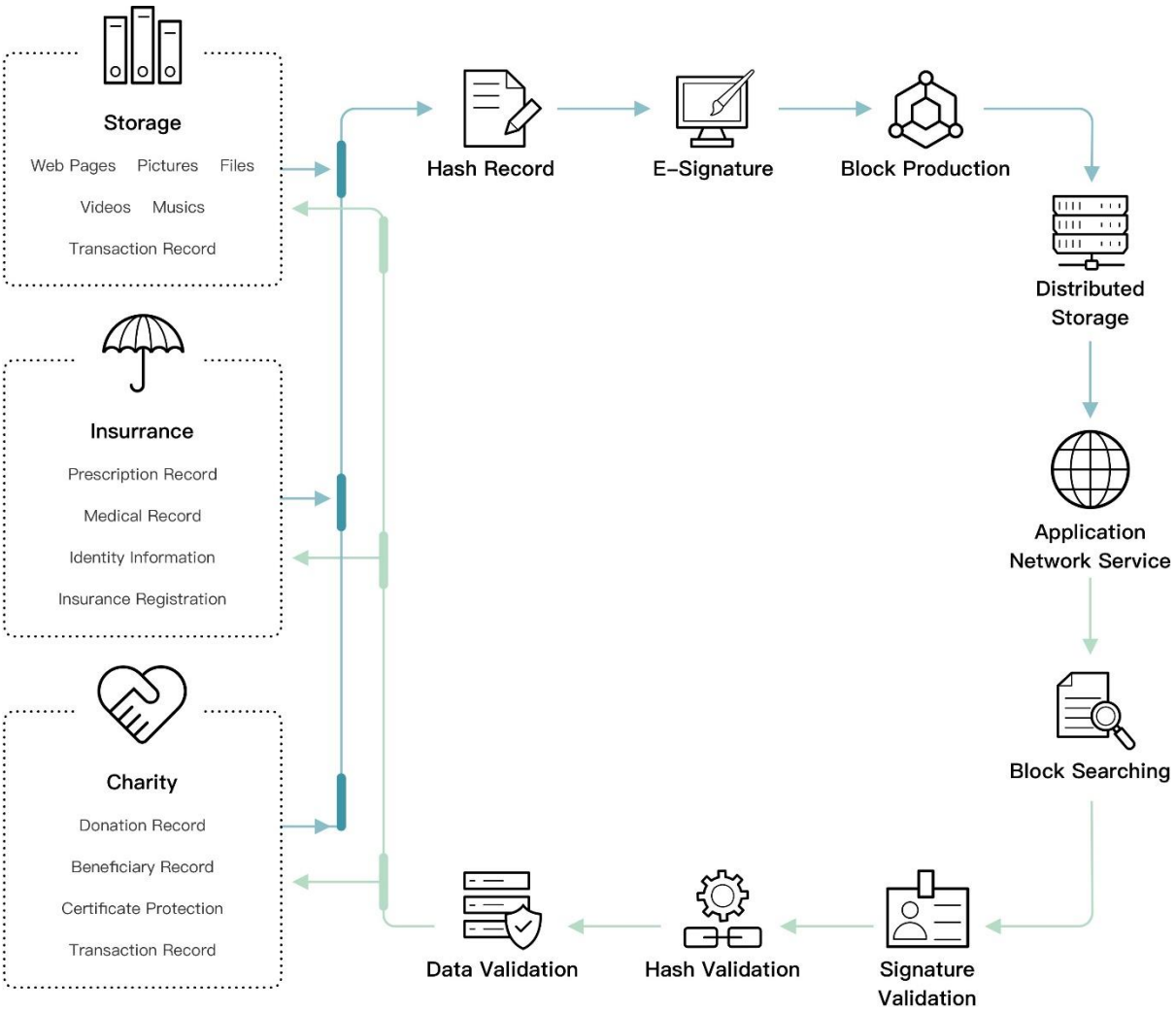


Figure 7. Dimension-D Architecture

3.3 Dimension-S

The conventional enterprises are facing pressures to be more innovative creative about their business model. They need to learn more competitive advantages from new technologies and opportunities. For example, the sharing and collaborative economy model can be a very good business solution for most enterprises. Other than this, more data is generated by mobile devices, which means human behaviors and mobile usages are becoming closer than ever, but the data ownership and rights have never been attributed, evaluated, quantified and used. The user as the data producer has never been benefited from the ownership. The value of the data is always fragmented and never really forms an effective interworking mechanism.

Dimension-S will map and segment real-world assets into digital assets, by providing a trading system to help enterprises promote data sharing and trading, which improves business profitability and economic efficiency.

- Mapping tangible assets onto blockchain: Dimension-S is a sidechain based on the characteristics of the real-world economy, which supports a variety of industrial applications and builds a secure, decentralized, high concurrency blockchain network.

- Establish a trading platform: Dimension-S will solve the data value problem by realizing users' data rights and data trading through a decentralized trading platform, which promotes data circulation and protects data ownership.

Dimension-S is suitable for business that requires mapping real-world assets onto the blockchain for trading and storage purpose, especially for industries with sharing economy and green energy.

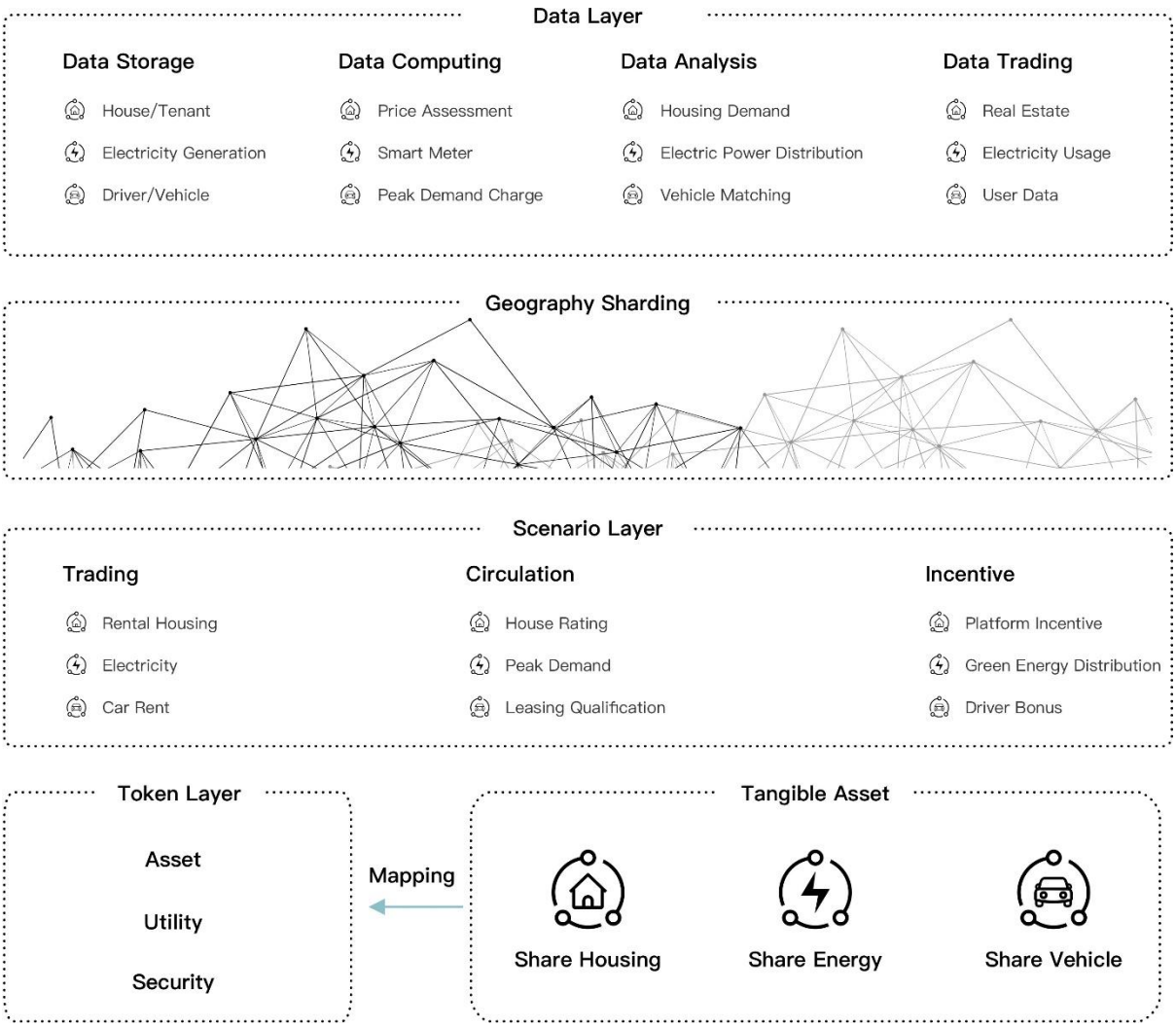
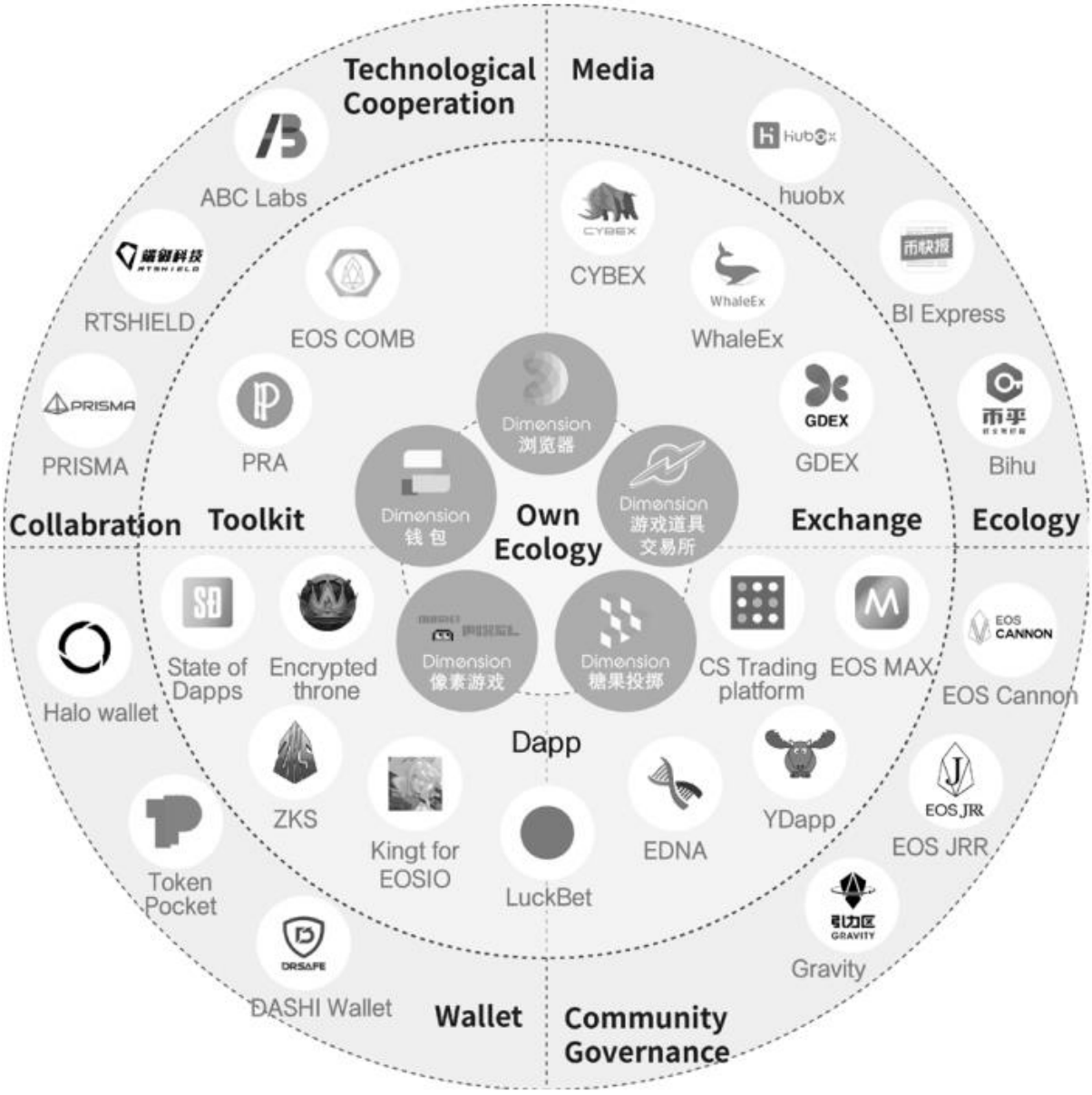


Figure 8. Dimension-S Architecture

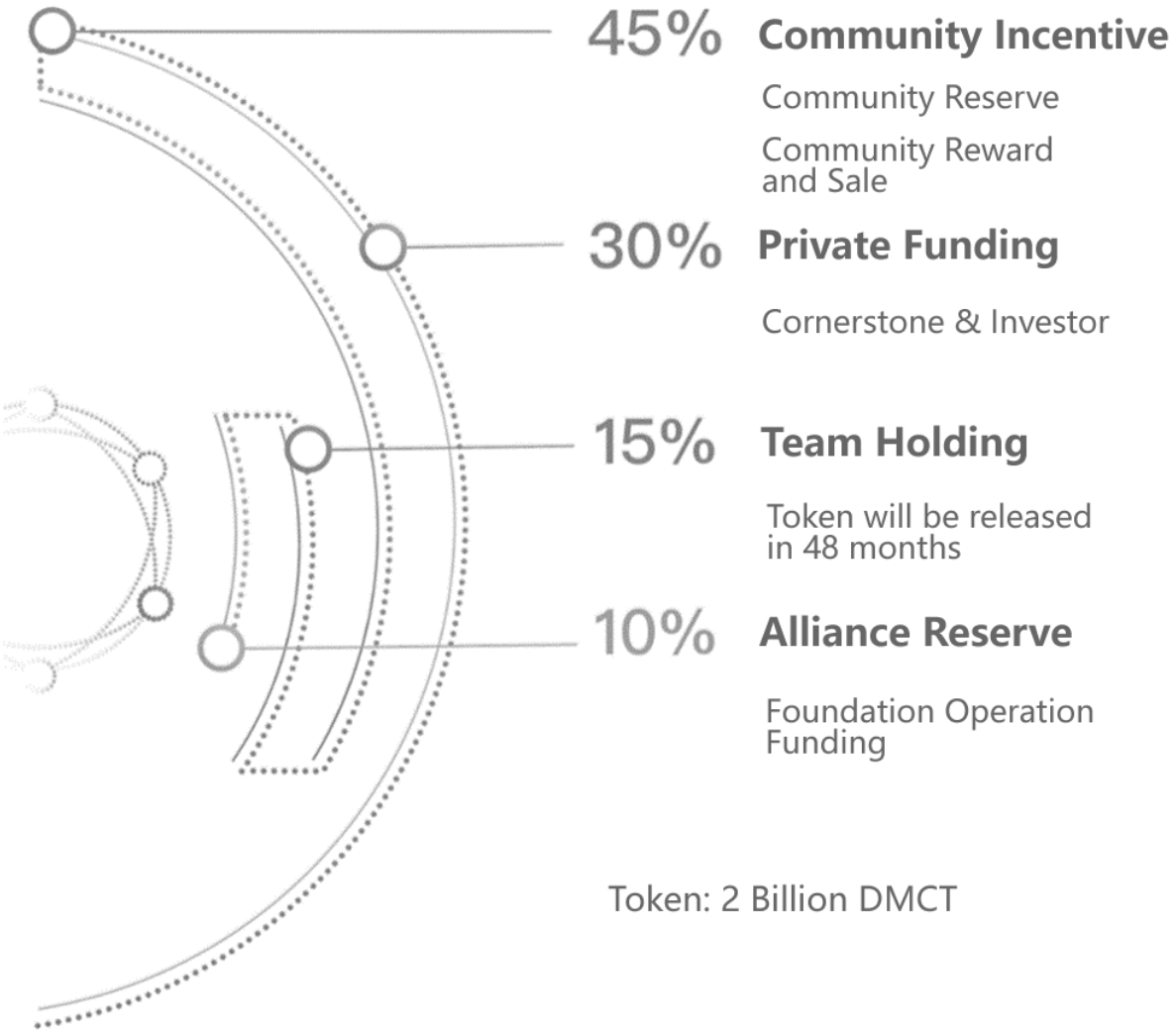
IV Governance

4.1 Roadmap

4.2 Ecosystem



4.3 Distribution



4.4 Team

LEADERSHIP

Fernando Liu

Chief Executive Officer

Fernando Liu is the CEO & Founder of Abacus, a clean energy private equity fund, and the former Asia-Pacific Regional Director of the Wall Street investment firm Barron Brothers.

Fernando successfully advised and assisted more than 50 Chinese corporations in their IPO launches on both NYSE and NASDAQ exchanges, including the listings of FSIN, SPU, ONP, and HRBN.

Being a financial libertarian and avid environmentalist, Fernando believes Dimension can strengthen global corporate financial services and will its use cases will further improve the current manufacturing ineffciency problems in China, and achieve a new dimension in various industries.

Olivia Church

Director of Fintech Security

Being a cybersecurity expert, Oliver has worked as a software engineer and security consultant for numerous online payment related technology companies, including Krisfin Software and Jinyang Payment.

His expertise shines in the design and maintenance of data security standards and policies along with the assessment and audit of security systems through various measures and operations of the system protocol.

Oliver envisions to construct a fully secure and privacy-focused blockchain to diminish the risk of decentralized payment systems.

Aditi Saxena

Data Scientist

Aditi Saxena is a data Scientist with solid data analysis background, Experience in development in Data Warehousing with Expertise in ETL tools. Implementation of full lifecycle in Data warehouses and Business Data. She worked in Infosys for over 7 years, the clients includes Morgan Stanley and American Express.

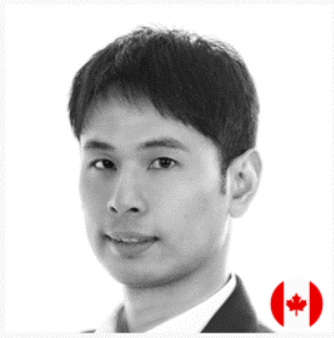
As the machine learning expert, she works directly with industry experts and technology experts to translate our customers' business needs into mathematical models or provides a creative approach based on Cloud offerings and will then present and deliver the solution approach to the client.

Melvin Adams

Director of Community Management

Melvin is a Chinese-American content creator passionate of the blockchain space and is an experienced moderator and community manager for various cryptocurrency channels. He has experience with creating promotional graphics and has generated many blog posts and videos on the topic of various blockchain-related projects, and is experienced in the fundamental analysis of major projects in the cryptocurrency space.

Melvin has invested in several cryptocurrencies and he envisions Dimension as the next step to the broader industrial utilization of blockchain.



Edwin Liu

Marketing Director

Edwin was the former Senior Real Estate Marketing and Sales Vice President at Sutton Real Estate Corporation, and with decade-long accumulation of experience in project marketing and event planning, in 2013, he began to step into the world of blockchain technology with the intent to transform this space. Edwin became a robust force in his stance in various cryptocurrency communities.

Edwin fully believes that Dimension's future appeals to the business community, and assists in various industries while allowing businesses to develop private-own or alliance-style blockchain technology services.

Daniel Wong

Chief Strategy Officer

Daniel previously worked as the head of Morgan Stanley's ITR ERDWH Big Data project, and has served as the senior strategic and technical consultant at Huawei Shenzhen headquarter. With the accumulation of his decade-long experience in FinTech projects, he single-handedly constructed a multi-national team of developers specializing in business intelligence, big data, and the integration of new and innovative technologies. He firmly believes Dimension, with its introduction of a brand-new business model that revolves around a permission-less blockchain, as well as its established resources from strategic partners, displays a huge advantage over existing projects in the blockchain space.

4.5 Investors & Consultants

ZENG Liang

Former vice president of Microsoft / Baidu

Chairman of International Digital Asset Charitable Foundation

Alvin Chan

CEO & Founder of Magic Oranges & JRR EOS

Visiting professor of FU Dan University

YU Wenbo

Executive director of FENBUSHI Capital