NEW AI Ecosystem White Paper

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Content

1 Overview and Design Concept of Bottos

What is Bottos?

Bottos is a decentrilized infrastructure that focuses on artificial intelligence. It is designed to be a consensus-based, scalable, easy-to-develop, and synergetic one-stop application platform for data, model, computing power and storage capabilities through data mining and smart contracts. Bottos has a bottom-level public blockchain specially designed on the basis of data characteristics as well as a platform for data circulation among different participants within a broad-based AI ecosystem.

Bottos can be applied to fields of big data, artificial intelligence, smart hardware, robots, Internet of Things, VR/AR and so on.

In a word, Bottos is not only an artificial intelligence public blockchain, but also provides services for data and models circulation. It realizes the value transferring of artificial intelligence and its derivatives fed by data, eventually forming a new decentralized AI ecosystem.

The basic public blockchain of Bottos is designed to serve artificial intelligence and has strong industrial attributes for its performance advantages in data, computing, storage sharing and more. Its original

technologies mainly include smart token design, lots-drawing DPOS algorithm, and decentralized storage with AI algorithm, leading competitive advantages in data privacy protection, big data storage, etc.

The basic service blockchain of Bottos aims to create a decentralized platform for data circulation, which helps obtain AI training data and attracts active participation of AI and its derivatives. The ownership of data and models is assured to encourage users to share and then make transactions quicker. Smart contract lifecycle management can be beneficial to eliminate trust cost and improve efficiency of AI and its derivatives.

Bottos adopts DApps as its main application development layer, which can be classified into three types: AI, AI Derivatives, and blockchain-based Technologies. DApps based on blockchain Technologies, such as Lightning Network, Oracle, Sidechain, and Cross-Chain, are mainly used to improve Bottos' ecosystem, and will constantly emerge with the iteration of blockchain technology. As for AI, DApps focus on pure software and feature iterations and upgrades of models after data feeding. DApps in AI Derivatives refer to the intelligent hardware, internet of things and robotics that combine software and hardware, which act as sources of new AI data through hardware. All DApps make closed-loop demands for data, eventually forming a data collection pool worldwide. Demands being mapped through blockchain-based technologies also exist among intelligent modules of DApps that can finally form a huge module collection pool. **In other words, model is a kind of data and will form a decentralized data collection pool that can be called**

IPDB. (Note: In general, the data here has a more generalized definition, and it contains models.)

In terms of artificial intelligence, Bottos draws on the successful experience of the Ethereum ecosystem, and then builds a decentralized artificial intelligence infrastructure to break the “isolated Data Island”, eliminate trust cost, and to realize data and model sharing in scale. Bottos also helps AI form relation mapping by using eco-DApps to accelerate the iterative scene-based functionality of AI, which accordingly produces integrated effects and will ultimately help realize practical artificial general intelligence (AGI).

In terms of data sharing, Bottos encourages users to share data through an economic incentive method called data mining to solve the problem of inaccessibility to high-quality data in the industry. Bottos will build the world's largest data/model pool (IPDB) based on blockchain technology, which is going to greatly promote the registration, exchange, and circulation of high-quality data and model assets/IP that possess real-time value.

Bottos **as a publich blockchain for AI**

Blockchain is a kind of data structure based on cryptology technology, which organizes and maintains large amounts of data in a decentralized way. All the data on the blockchain is attached with an individual digital signature that cannot be forged. In addition, the totally public-facing blockchain enjoys various advantages, such as high reliability, instant settlement and distrust. It

enables global data sharing and traceability, which will make it possible to establish a global decentralized AI data training platform with larger scale and higher quality that can control the privilege and conduct audits.

Bottos, a public data blockchain for artificial intelligence, can greatly protect the privacy of user data and ensure that all data should be authorized by users before circulation and the users' data won't be sold again without a second authorization due to its unique performance. Nowadays, as the *Network Security Law* are increasingly perfect and sound, 90% of big data companies are on the verge of survival, and thus abuse of user data and leakage of personal privacy will surely become a thing of the past. Also, as data security is rising to a country's strategic level, blockchain based on cryptography technology organizes and maintains large amounts of data in a decentralized way, which will enable global-scale data sharing, and help AI break data oligarchs and build a new AI ecosystem.

Bottos' Design Philosophy

Data is treasure. Dominating data makes power. In this case, pursuing autonomy and decentralization is necessary. Bitcoin has implemented autonomy and decentralization of property rights through public-key cryptography and POW consensus mechanism. While Bottos transfers and upgrades data, speeds up data flow, and then accelerates the evolution of artificial intelligence through data mining.

Data is the new form of oil. The Bottos platform gathers numerous

companies focusing on big data, artificial intelligence, intelligent hardware, robots, Internet of Things, etc. All of these companies will be DApps on the Bottos' platform. They take data as "oil" and create new productivity in a decentralized way.

There's no doubt that AI will have new productivity in the future and blockchain technology will restructure productive relation. Bottos' platform implements a new decentralized AI ecosystem based on blockchain technology.

Bottos' Solutions

The public blockchain of Bottos is designed around the characteristics of data to conquer issues like "data security", "large-scale data storage", "data cleansing and labeling" and "data fraud". The public chain is created by original technologies including "prudent identity system", "lots-drawing DPOS consensus-based algorithm" and "intelligent portion storage".(Note: Details refer to the published technical documents.)

To serve the community and DApps is the criterion of a public blockchain. The pioneering "DApps multi-value token system" is implemented rapidly around the world to apply DApps into business in an intelligently derivative way. Data mining is also initiated to encourage data sharing, which can help users liquidate their unique data so that everyone is able to boost AI.

Bottos’ platform assembles a large number of continuous AI training data and models. With the expansion of the community and AI resources, rules modules based on blockchain technology can be stacked, making the whole ecosystem possible to evolve into artificial general intelligence (AGI).

Innovations of Bottos' Key Technologies

（1）Original Data Market mechanism to launch the engine of high-quality data flow

（2） Initiative "data mining" and "intelligent storage" to ensure data security and privacy

（3）Pioneering "multi-value" and its value system to rapidly put DApps into practice

Bottos’ Goals

1.To establish a decentralized AI infrastructure to realize Artificial General Intelligence

2.To build the most efficient intelligent data exchange center worldwide

3.To set pricing standard of data assets

Bottos’s Application Scenarios

1. Big data

Data is a future asset for enterprises, so is personal data. Bottos’ built-in authentication system specifies the uniqueness of data as an asset after the registration and validation on the blockchain. Big data companies can access Bottos as nodes to realize correct data confirmation and data circulation. They can liquidate their own data as well as ensure data privacy and ownership. Big data companies can also collect data through Bottos's huge community and achieve one-to-many data cleansing and labor subcontracting of data tagging via smart contracts.

2. Artificial intelligence and AGI

With the recently popular AI algorithms, such as deep neural networks, Monte Carlo search trees, intelligence in specific fields is not far from us, but the development of artificial general intelligence is seriously lagging behind. On the one hand, Bottos can help artificial intelligence quickly obtain the needed training data. On the other hand, it can invite all AI participants via smart contracts and eliminate trust cost to greatly boost the research and development of AI.

Bottos can accelerate the arrival of AGI for speeding up the circulation of data that allows isolated data and models to form a new accumulation. With Bottos, artificial intelligence has obtained not only high-quality training data, development capital, but also the market valuation of data and models as well

as Token's liquidity, eventually setting a market pricing standard for data and models.

3. Smart hardware, Internet of Things, Robots, etc.

Smart hardware, Internet of Things and robots all belong to the upstream artificial intelligence and are combinations of software and hardware. Here, hardware can be regarded as a tool for data collection. Bottos starts with "data mining", for which intelligent hardware, Internet of things, and robots can be seen as "mining machines" at the data level. On Bottos, the combinations called artificial intelligence derivatives, can achieve product crowdfunding and mining machine iteration by working as mining machines to mine data, which in turn realizes a dual upgrade of software and hardware. The implementation of artificial intelligence derivatives on Bottos includes the creation, circulation, and buy-back of Tokens. New tokens are expected to come along with every promising technology products and will be generated by data mining like Bitcoin after people use the corresponding products. On the Bottos' platform, the worthy Token can apply for a direct exchange with the Bottos Base Token (BTO) via a community poll.

4. Super Robots

The super robots people usually imagine are like terminators who are capable, thinking, deformable, and equipped with various inductive and recognition functions. The future AI is strong AI, and robots will also have emotions. To make robots execute human instructions and prevent similar

behaviors like attacking human requires the entire transparent and open robot intelligent module, which means only the robots recorded on the chain can guarantee safety. The number of robots in the future will be so many times larger than that of humans that the centralized management will lag behind. The necessity of registering, recording, and managing the birth and historical behavior of robots in a distributed manner inevitably brings the “robot national ledger”. In the future, robots can access Bottos' built-in identity management system in the form of nodes.

2 Project Background

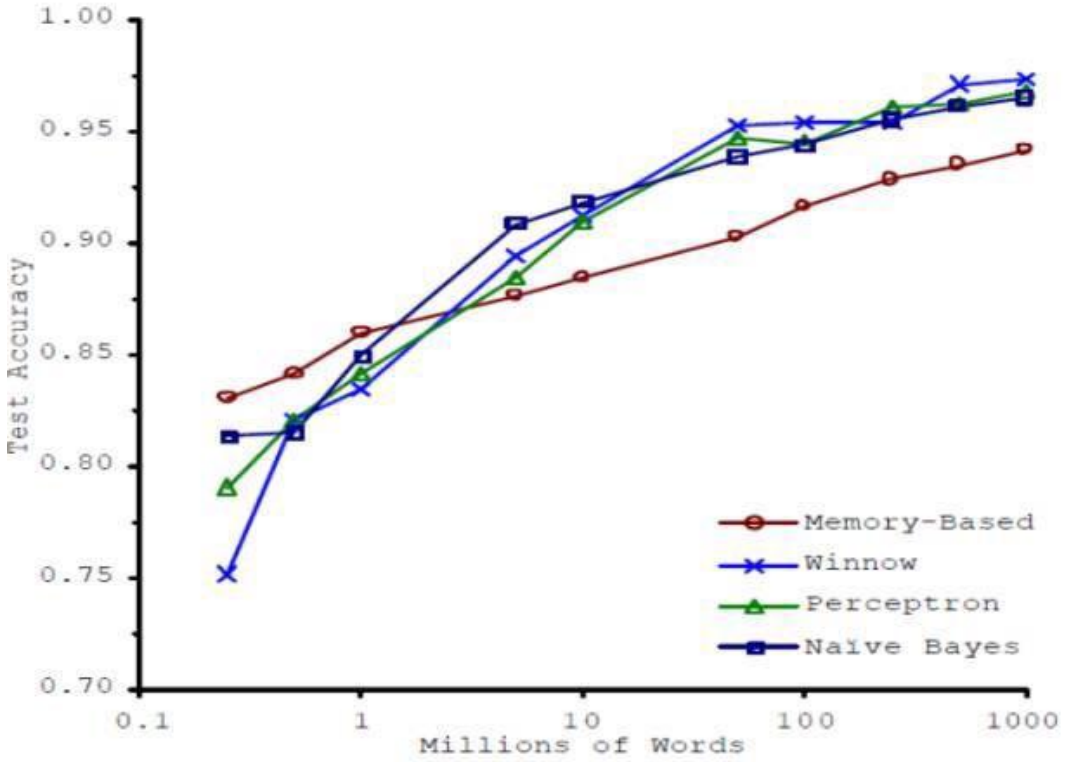
Market research firm IDC predicts that by 2025，the “digital universe” (data created and replicated every year) will reach 180 ZB(1.80×1023 bytes), which will take more than 450 years with broadband to transmit. From toilet seats to toasters, subways to wind turbines, more and more equipment is becoming the source of data collection. Everyone is competing to collect much more data from different sources, such as photos and video streams uploaded by social network users, information generated while commuting or exercising, as well as numerous sensor output data attached to different scenarios on the jet engines.

Data is to AI what “milk powder (formula)” is to a baby

With the iteration of artificial intelligence technology, the quality and scale of data have become the bottleneck for its development. The data scale becomes even more significant after an eye-catching paper was published in 2001 by two researchers from Microsoft, Michele Banko and Eric Brill. First, they described that the number of training words used in most natural language processing work is less than 1 million, which is a very small data set. For the algorithms such as Naive Bayes and Perceptron, the error rate is as high as 25%, while the more advanced, newer, memory-based algorithm

has an error rate of 19%.

Here are four data points at the far left of the following picture.



Source: Banco and Brill, 2001

It is not the most amazing thing. Later, Banco and Brill showed impressive results: As you add more data—several orders of magnitude, and then keep the algorithm consistent, the error rate will sharply decrease. The error rate is less than 5% when three more orders of magnitude are added. 18% and 5% make great difference in many fields because the latter is valuable in practice. But will the error rate keep decreasing significantly if the data scale reaches a higher order of magnitude?

Data quality determines artificial intelligence models

Besides the data scale, data quality plays a decisive role. If the junk data is adopted to train models, you will get models of low quality. The junk data may come from malicious or non-malicious breakdowns that can crash or tamper the data, such as faulty IoT sensors, faulty data sources, or environmental radiation that causes bit flipping (bad error correction mechanism), etc. It makes sense that AlphaGo eventually chose the wisdom of high-quality groups rather than just learning a massive chess manual. AlphaGo invited more than 200 second-rate chess experts to evaluate the nodes and then summarized their results to beat a world's champion. Later, it introduced "machine learning" to win Ke Jie, a Go championship holder, 13 times in a row.

Initially, Facebook and Google collected users' data from reviews, likes and other interactions, to improve targeted advertising. In recent years, these companies found that data can be highly utilized for artificial intelligence (AI) or "cognitive" services, and some can also generate new sources of income. In the age of traditional Internet, it takes considerable cost to collect vast amounts of data. If you have resources in hand, you can easily get data. Sometimes you even firmly keep your data to yourself. In this new world, data is the oil, and artificial intelligence algorithms are what will consume it.

More data means more wealth, but big data is controlled by few people.

Nowadays, when an App is installed, it is a must to "agree and install it". We are using our data in exchange for "free" services. Whether this

transaction is fair or not depends on where the value of these services come from: data or an algorithm for analyzing and processing data? In the early stages of web searching, the value of newly added data decreases as the size of data increases. The increasing information won't create more value once exceeding a certain threshold. However, with the growing self-learning ability of the algorithm in the era of artificial intelligence, the apps get more and newer data as feedback, creating better search results. For example, with online car-hailing, new data may not add value as it has enough data (such as real-time traffic information). But the new data can serve other purposes as long as you continue to collect, such as route planning.

Massive data of uneven quality may advance the quality of the AI model(Figure 1),but only new data with high-quality (may not massive) can drive and make qualitative change to a model(Figure 2).

Big data companies, especially Internet companies that can obtain massive real-time data from different users, are impossible to surpass by other companies for constantly optimizing their systems through analyzing these data. Sometimes small companies may call data via the API provided by large companies, but no data on user behaviors is publicly available for free, thus forming a monopoly on data. Actually, this monopoly can also be regarded as the monopoly on information and resources in the information age.

Figure 1: MORE data -> Model + Figure 2: NEW data -> NEW model

However, this will be a thing of the past.

Throughout the development history of artificial intelligence, it has moved from the first stage features technologies driven by algorithms and computation, to the second stage, data deeply driven by massive amounts of structured and reliable data. And when it comes to the third stage, scenario-driven force dominates. We are now undergoing the transition from the second stage to the third stage. On the one hand, the deep learning model is upgrading (such as the migration learning model and the multi-task learning model), on the other hand, compared to millions of training data for a rough AI model, thousands of tagged training data that has undergone refined processing can also achieve the same goal.

Artificial intelligence models are mainly based on deep learning models. Deep learning models are rarely used in medicine, education, and many other fields of daily life, though they are now influential in the fields of voice, image, recommendations, etc. First, it lies in that the data we get is often small, such as data on personal mobile phones, educational and medical testing as well as questions and answers of customer service. Second, deep learning model

transforms the original features from low level to high level in a non-linear way, which is a very complex and fragile process. The third problem is the application, especially the personalization of learning and application in machine learning. Taking the mobile phone as an example, any recommendation on information and services should be suitable for the users' behavior. Since any personal data is small, the problem here is how to adapt the general model of the cloud to the terminal's small data so that it can work better. This requires an upgrade of the deep learning model, such as a migration learning model that focuses on small data training, namely, a task parameter that is specifically optimized, and performs well when dealing with another task, which can help machine learning migrate to the mobile from the cloud.

In this way, individuals will have a learning model, completely personalized and decentralized, which subverts the centralized model in the era of artificial intelligence 2.0. This is the AI democratization advocated by Li Feifei, a professor of Stanford University and the founder of ImageNet's. The decentralized AI model built through the integration of blockchain, artificial intelligence and data will be the milestone in this era of AI democratization.

To simply make the most of small data, we are not far enough in the artificial intelligence 3.0 era. How to quickly obtain tagged training data after refined processing also determines the evolutionary speed of the artificial intelligence model. In general, the more accurate the data is, the better the model will be, as well as the product effect. As a result, Artificial intelligence

companies must accumulate tagged data that is more refined and accurate, conforming to their own application directions. Different application directions require different content, and even different tagging methods, which constitutes an on-demand market. Also, the tagging is demanding, most artificial intelligence companies and crowdsourcing platforms cannot meet these requirements. To a certain extent, the competitiveness of an artificial intelligence company depends on the quality of tagging data, data collection, data cleansing, etc.

In the third stage of artificial intelligence, in which dimensions and quality of data collection are more demanding, we can not only provide personalized services for different users, but also implement different decisions under different scenarios in a real-time way, for promoting better development and giving decision makers a keen insight of the event to make more accurate and smarter decisions. By contrast, the traditional way of information gathering on the Internet can hardly meet the personalized needs.

In the age of artificial intelligence, the value of data wealth will gradually manifest, and data is spawning new economies. With the amount of data increasing, artificial intelligence creates new productivity, while blockchain reconstructs production relationships. We are about to enter a new era of distributed artificial intelligence as the scale and quality of data is increasing that makes artificial intelligence models continuously iterated and stacked. Distributed computing speeds up the arrival of artificial general intelligence (AGI). Therefore,

we firstly proposed the concept of a "decentralized artificial intelligence infrastructure", tailored for the artificial intelligence industry, from the bottom layer of the blockchain, the service layer, to the application layer.

Bottos implies the robot operating system, and Bottos hints the BOT ATTOS (Italian). A combination of these two words means creating a distributed intelligent robot system with artificial intelligence developers from all over the world. Hence, Bottos was born.

2.1 An Overview of Problems

Saving your data as a competitive advantage or sharing with others? Artificial intelligence adores data. The more data that is collected, the sounder the model will be. In general, the data is like an isolated island, especially in the new environment where data is encouraged to only serve yourself, acting as your “moat”. However, with a blockchain control featuring decentralization/sharing, data sharing is easy and possible, which can bring more, fresh data that can make newer, better models.

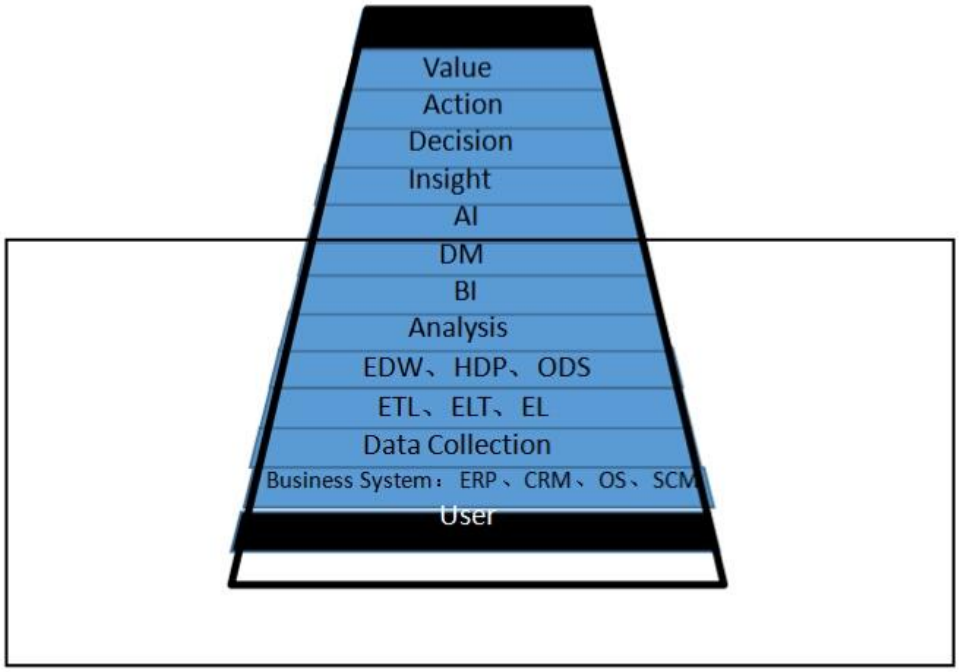


Figure 2: Analysis Framework of Big Data

In the above framework (Figure 2), the closer it is to the bottom layer, the more time the data analysis process takes. When it climbs to the top side, decision-making time gets rather shorter. In terms of frequency and data value, a process at the top offers low frequency but high value while one at the bottom features high frequency but low value. That's why Bottos encourages data sharing which in turn improves models and then lowers costs and brings higher profits (Figure 3).

Centralization or decentralization? Even though sharing can be achieved without blockchain by some companies, the benefits of decentralization are worth more. First, decentralization helps build a sharing infrastructure, which is conducive to a uniform standard for the whole

ecosystem, thus establishing a universal registration center. Second, decentralization makes it easier to turn data and models into assets for others to use via authorization, which can be profitable. Third, decentralization helps to form a global-scale data sharing-the IPB (the Intel Planetary Data Base).

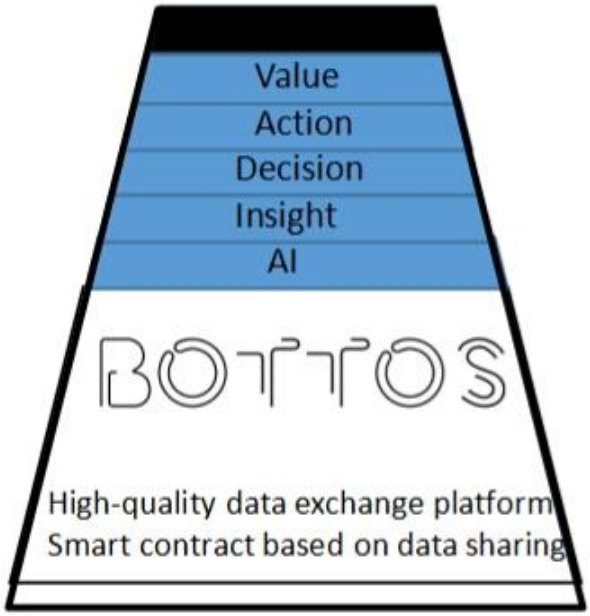


Figure 3: Bottos' Analysis Framework of High-Quality Data

Many companies have selected and repackaged public data to use easily in certain aspects such as APIs for weather or network time, as well as financial data for stocks and currencies. To date the public data market value has reached over one billion US dollars. Bottos also aims to build such a platform to make data access through a single database in a similarly structured way (or just through the API). With regard to the external data,

Oracle can play its role in making data easy to use via the blockchain. In short, Bottos hopes to create new dimensions for numerous databases and data sources.

General public blockchain or public blockchain exclusive to artificial intelligence? Bitcoin went on-line in early 2009, marking the first generation public blockchain. Around 2014, the integrated public blockchains such as Ethereum featuring smart contracts came into being, which could support diverse business scenarios and derived quite a few decentralized industrial applications (DApps). Meanwhile, lots of challenges are inevitable in the development of the public blockchain. As a matter of fact, the current public blockchain platform mainly supports virtual digital assets and virtual digital application scenarios and has a weak connection with the real world, generally reflected in both performance and diverse business requirements.

The problem of performance is easy to understand due to the naturally irreconcilable contradictions between decentralized features and TPS (Transactions Per Second). Ignoring the impact of hardware, dropping the decentralized features of the public blockchain will inevitably improve TPS. Besides, it’s hard for the relatively fixed single public blockchain to meet the diverse demands among various actual application scenarios because industries individually have their own unique governance models, access requirements, privacy protection, etc. As the next-generation public blockchain system that precisely serves the AI and its derivatives in architecture, governance models, and development, Bottos has been digging into AI and

has presented its unique innovations in consensus algorithms, decentralized storage, and architecture governance in order to quickly mature DApps which is one of Bottos' core goals.

Keep data like an isolated island or select the high quality data together?

As already mentioned, common people don't have access to confirm whether there is any defect in training data and what the data in and out of the model is like. Therefore, the data provider only needs to label the model with a timestamp in each process of building and running models, and then add the labeled models to the blockchain database (including digital signature for models), making data traceable in model aspects/application models.

In this case, it is beneficial to discover leakage and tamper fraud in data supply chain on all layers, so that the reason why the mistake occurs is clear. The same data source reviewed in many ways will guarantee the validity of data and models.

To be free or charged? Data and AI models, protected by copyright law, can be used as an intellectual property (IP) asset. Once the data/model is built, you will own the copyright and be able to authorize others to use it. Bottos' system will build a decentralized "exchange center" to create various functions of data/model assets, such as registration, circulation, transaction, etc. Decentralization here avoids entities from controlling the data storage infrastructure or subjects from owning the ledger. Instead, the registration of

the entire ledger is done by the consensus-based nodes of the whole network. All of these will bring a truly open data market, which is exactly what people in the fields of data and AI expect for quite a long time.

Permissions can also be used as assets in Bottos. Data creators can draw up the license in advance to limit the using of upstream on launched data, such as read privileges or view privileges only for a certain part of the data /model. The rights you own can also be transferred to others in the system just like Bitcoin. The data/model permissions can even be regarded as original assets of Bottos.

Artificial Intelligence DApps and Data Mining? Bottos builds a decentralized database infrastructure via decentralized processing (using smart contracts to be the storage-state machine), which is consistent with the essence of "smart contract" technology like Ethereum. On the basis of Ethereum, DApp projects can be used mutually due to the interrelated business models, which helps to build a strong ecosystem that AI currently lacks.

With an underlying blockchain infrastructure and smart contracts, Bottos creates the “data investment”, making the entire process of data training models accumulate wealth independently. The Bottos opens source community will be committed to acting as Ethereum in the AI community, which will attract global AI companies, developers, data companies, and individuals to jointly build a brand new AI new economy.

2.2 Mission and Vision

As an infrastructure focusing on AI, Bottos has a bottom-level public blockchain specially designed on the basis of data characteristics as well as a platform for data circulation among different participants within a broad-based AI ecosystem. The data circulation in Bottos, which constitutes the world's largest pool of data collection based on blockchain technology, originally creates smart contracts featuring data investments to realize personal data assets shared via data mining. In this way, the data circulation forms a connection between the value of personal data and AI models, curing the pain of inaccessibility to high-quality data in the AI industry.

Bottos will greatly promote the registration, exchange, transaction and circulation of high-quality data and model assets IP that possess real-time value, which will provide high-quality data/model resources for data demand parties and implement shared value for data/model providers by the way of "data investment" through highly scalable smart contracts.

Bottos will usher in a revolution in the AI industry, bringing a series of systematic market changes in artificial intelligence, smart hardware, robotics, the Internet of Things and so on. Bottos has been designed as a platform for a new AI ecosystem, which will power artificial intelligence. We believe that the coming of artificial intelligence will form a global pool of structured big data so that all of us can share the new fortune in the data era.

2.3 Major innovations

(1) Building a public blockchain exclusive to AI based on blockchain technology

Blockchain is a new application mode of several computer technologies such as decentralized data storage, point-to-point transmission, consensus-based mechanism, and encryption algorithms. Bottos creates a public blockchain exclusive to AI, which is based on the public blockchain with four main features. First, it encourages data sharing under the control of decentralization/sharing. In this way, Bottos will provide more data for AI, thus providing better models as well as new models. Second, this public blockchain transforms AI products into DApps on Bottos through "data mining", which can quickly realize the upgrade of software and hardware. Third, it will trace the provenance for data/model via tamper-resistant/audit tracking records, thereby changing the credibility of data and models, making intelligent robot ID systems for recording all data possible. Fourth, by building original assets/establishing an exchange center, registered data/model permissions can become intellectual property (IP) assets to form a decentralized exchange center and a value definition platform, thereby establishing a high-quality data circulation center and heading for the formation of the world's largest data collections pool.

(2) Everyone boosts AI. Decentralized collaboration implements AGI (Artificial general intelligence) clusters.

At present, AI possesses various powerful capabilities including computing, derivation, searching, recognition and prediction. The integration and amplification of these capabilities will only enable AI to become a rational smart machine in the future instead of being as smart as human pets like cats and dogs that have the "smart" nature with obvious life characteristics for its lack of spontaneity and subjectivity, sensibility and other conscious traits. Besides, AI doesn’t have a carbon-based material composition mechanism like mammals so that we cannot impose peculiar intelligence attributes that mammals possess on machines. (AGI's research partly starts with analyzing the neural mechanism of the brain.)Therefore, the exploration of AGI doesn’t necessarily rely on methodology that simulates the neural mechanisms of human brains or advanced mammals. It is possible that the self-knowing intuition characteristics of the digital life can be motivated after AGI exists in the form of data (usually also information) gets developed and stronger on the rational level. This inspired time node is scientifically known as the arrival of AI singularity, which can be implemented in the BOTTOS ecosystem as follows: 1. Quantitative changes lead to qualitative changes, 2. Masters from the general public disturb the transformation process effectively.

(3) Data Market works as a launch engine for high-quality data circulation.

Data Market, including Oracle and DataFeed mechanisms, is the bridge between the real world and the data world for Bottos that aims to build a world-class, high-quality data training platform. Data Market is the launch

engine for high-quality data circulation to make external data easy to use via blockchains. Meanwhile, Bottos is also an artificial intelligence model pool, which can be easily called and stacked by artificial intelligence companies to form more advanced models. In a word, Bottos hopes to expand a new scale for numerous databases and data sources, including model libraries and model sources.

(4) "Data mining" and "smart storage" have become models for the design of data public chain.

The bottom layer of Bottos' system not only uses the account system to achieve compatibility with external virtual machines such as Ethereum EVM, but also creates contracts with smart data investment to achieve economic incentives for the original data/model assets, making the process of the entire data training model itself able to accumulate wealth. The data and model wealth is reflected in the whole ecosystem of Bottos, which is the value in data and model circulation.

Bottos can be used in artificial intelligence and its derivative industries, including big data, Internet of Things, smart hardware, robots, etc. The companies focusing on big data and Internet of Things can access Bottos as data nodes and gain benefits by sharing data. Intelligent hardware, robots and other combinations of hardware and software can design their hardware to collect valuable data just like mining machines, which can generate revenue and realize the dual iteration of hardware and software to rapidly develop this industry after the use and mining of their users. The introduction of AI

technology into the design of the bottom chain is a unique feature of Bottos' public chain and DApps ecosystem on Bottos in the coming years. For one thing, decentralized storage is an indispensable part of data security; for another, Bottos creates a service sample in decentralized computing and other aspects for the main chain by introducing AI technology into decentralized storage.

(5) The pioneer of "multi-value system" and its value system to help DApps improve quickly.

Bottos is committed to building a new ecosystem of artificial intelligence, and an exclusive public chain of artificial intelligence, an infrastructure that serves AI, and making the design of tokens more flexible. The pioneering "multi-value system" and its value system allow the main Token to have its own stable value mechanism with lock-in incentives and secondary derivation, which can be integrated with the business entities and help DApps improve quickly.

(6) "Toy Brick" model with dynamic node

The blockchain is composed of different nodes with relatively fixed functions, which greatly limits the expansion of blockchain functions and makes it hard to exploit the advantages of division of labor brought about by blockchain decentralization. As an artificial intelligence infrastructure, the Bottos blockchain provides different services. Therefore, as the node introduces the micro-service architecture, the node functions can be

dynamically organized and defined. The node types can also be dynamically distributed to the blockchain network, which forms a decentralized network composed of different functional nodes. The node can be flexibly deployed in different systems according to different functional requirements. It can be a host with lower performance, a powerful workstation, or a cloud computing platform, to form a flexible and configurable network system.

To this end, the Bottos system proposes a manageable dynamic node model that supports the deployment and management of nodes, as well as the release and update of node functions.

(7) One-stop service and release of DApp

The Bottos-designed microservice architecture brings the flexibility of functional deployment, while the business DApp provides convenience for flexibility in deployment. Considering the difficulties of a DApp's development and deployment, Bottos proposed one-stop development and deployment services of DApp , providing the corresponding basic features to support DApp agile launching systemically:

➢ Support Token's distribution, naming, hosting and other services.

➢ Support Off chain data storage service to solve chain storage problems.

➢ Support the release and discovery of DApp services to make

it easy for users to uniformly call.

➢ Provide decentralized transactions of DApp Tokens to rapidly realize and converse Token value.

➢ Provide one-click rapid deployment for DApps installation and deployment.

➢ Provide DApp related contract management and deployment to support promising standardized contract templates.

2.4 Core objectives

（1）Build the world's most efficient AI data exchange center

Bottos builds a decentralized AI data exchange center based on blockchain technology, which allows the world to cooperate more efficiently and allows the data to be richer and more reliable. Bottos provides better models out of new-scale data for AI developers and companies, as well as updated models due to updated data.

2.Building a new artificial intelligence ecosystem

The Bottos platform allows any dev team or company to build AI algorithms/models and then fund the search for high-quality data to train algorithms/models, meanwhile, bringing new economic incentives to those data providers. It also makes crowdsourced intelligence and aggregated data

more appreciated. At the same time, the user base of Bottos has also continuously grown due to the continuous expansion of ecological applications. It has obtained traffic from the entrance of products such as smart hardware within the ecosystem, which has further increased the value of the platform.

3.Form the pricing standard of global data assets

Bottos aims to build a global open data exchange platform with a single pool of liquidity that makes it possible to create artificial intelligence projects easily. When a large number of data transactions are possible, the Bottos platform will continuously update the system through artificial intelligence algorithms and eventually become the standard for data assets.

3 Core Commercial Logic

3.1 Layered Design of Bottos

The Bottos platform will consist of three main layers: the bottom layer, the service layer, and the application layer:

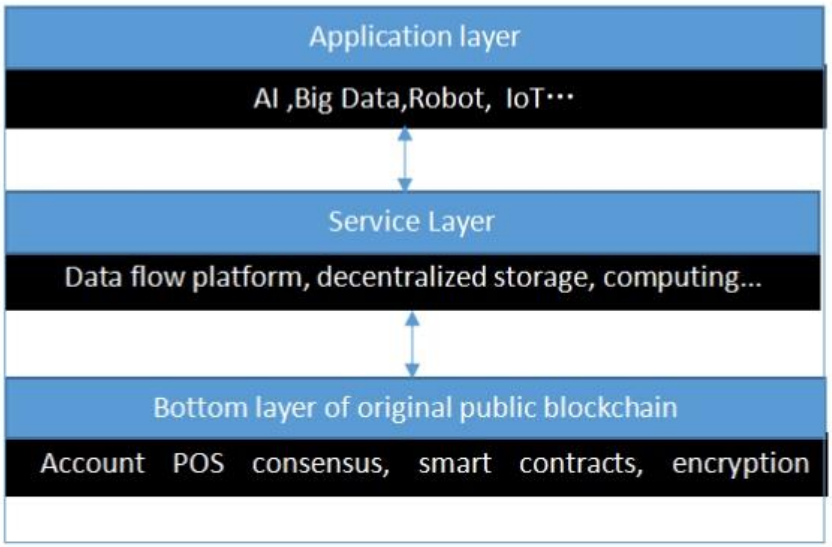


Figure 4: The main layers of the Bottos platform

The Bottos public blockchain includes the bottom layer and the service layer, and the bottom layer covers account-based systems, POS consensus algorithms, smart contracts, etc.

The Bottom Layer of Bottos adopts an account model to implement Bottos VM, which is compatible with Ethereum Virtual Machine (EVM) and other public blockchain Virtual Machines.

3.2 Bottos Data Services

Bitcoin pioneered computing mining for tokens successfully. However, it consumes massive computing and other resources. So we put forward a new model for data collection and data mining, in which users only need to offer the testing data instead of investing computing largely. The tokens can be earned by maybe uploading some dialects, several birds' pictures, or audio files. It is more meaningful to issue tokens in this way, which is more in line with the idea of a modern sharing economy.

Figure 5: Function Diagram of Bottos

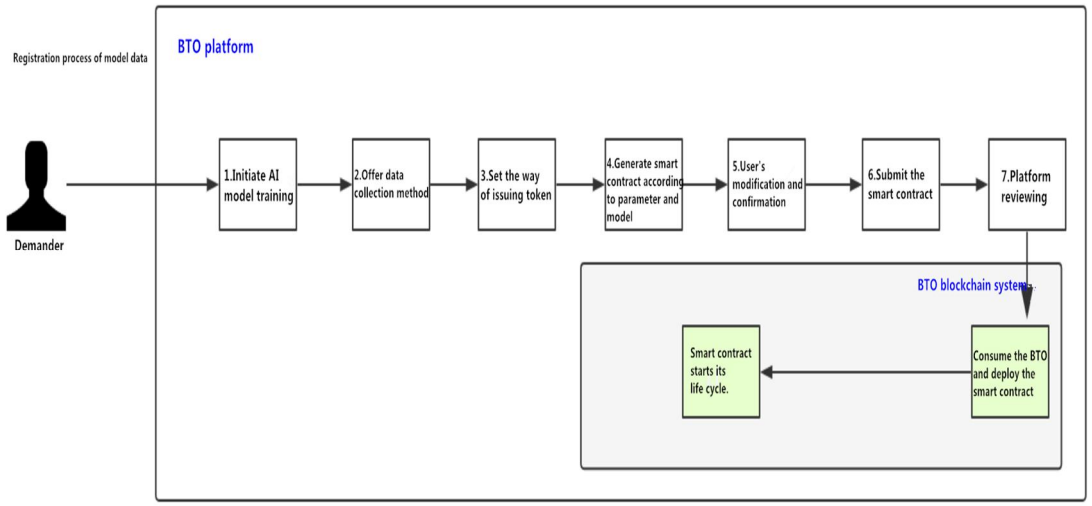
Three parties of data collection:

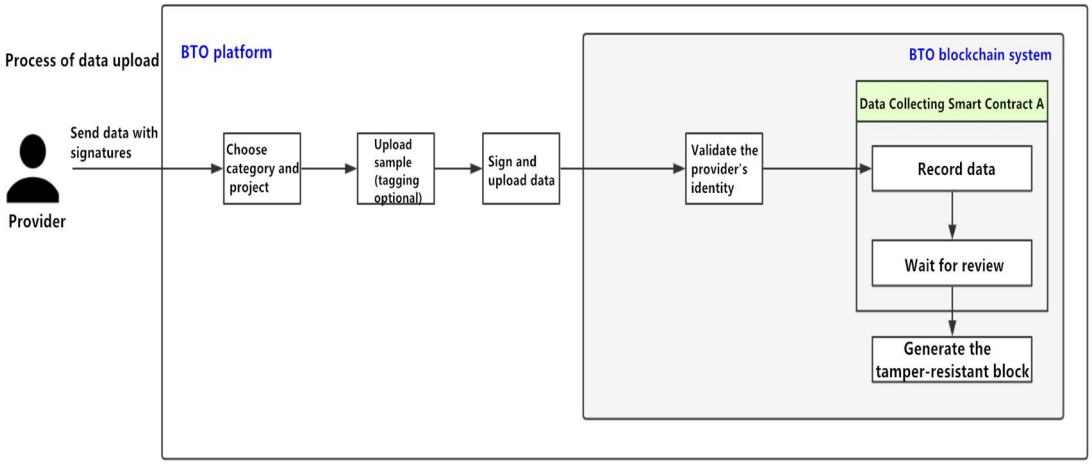
1.Demander of Model Data (hereinafter referred to as Party A)

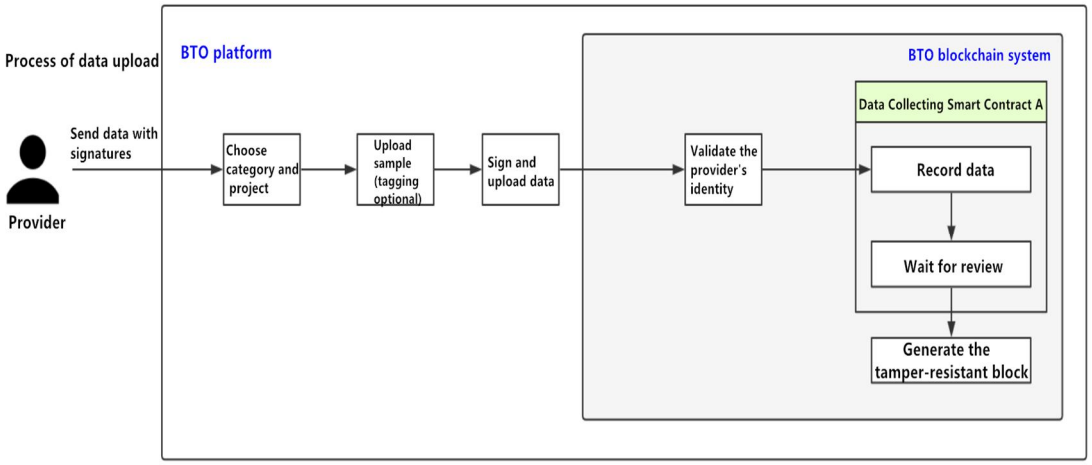
2.Provider of Model data (hereinafter referred to as Party B)

3.Verifier of Model Data (hereinafter referred to as Party C)

Figure 6; three parties of data transaction


Registration process of model data
BTO platform
Demander
1.Initiate AI model training
2.Offer data collection method
3.Set the way of issuing token
4.Generate smart contract according to parameter and model
5.User's modification and confirmation
6.Submit the smart contract
7.Platform reviewing
BTO blockchain system
Consume the BTO and deploy the smart contract
Smart contract starts its life cycle.


Process of data upload
BTO platform
BTO blockchain system
Send data with signatures
Provider
Choose category and project
Upload sample (tagging optional)
Sign and upload data
Validate the provider's identity
Data Collecting Smart Contract A
Record data
Wait for review
Generate the tamper-resistant block


Process of data upload
BTO platform
BTO blockchain system
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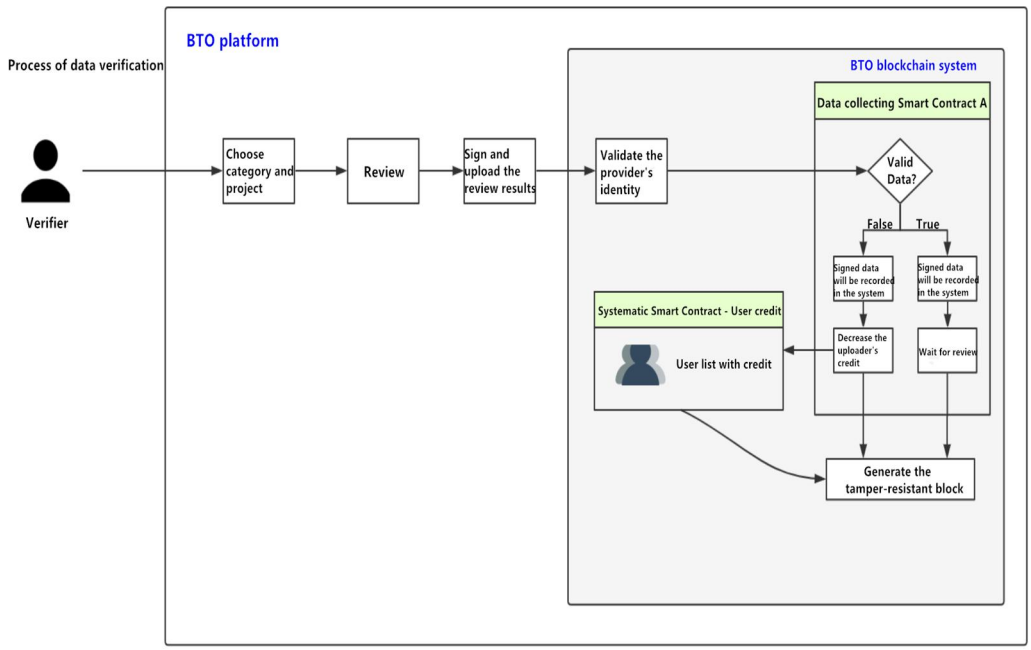
Generate the tamper-resistant block



Two basic points of data mining:

（1）The blockchain guarantees the traceability and tamper-resistance of any operation;

（2）User's credit(data quality rating) will be affected by any malicious operation, which will largely decide the user's income.

3.3 Bottos Storage Service

As a provider of the data exchange market itself, Bottos, with a core technology of data storage, needs a massive, reliable and decentralized storage system to collect data. Therefore, Bottos designed decentralized storage and realizes this co-building node storage service through incentive mechanisms.

Considering the users’ storage requirements, Bottos provides two choices. First, it provides a basic storage service for the ordinary users whose data storage is certain, short-term, and of small scale. Second, it provides paid storage service which is available in the Bottos' storage transaction market, for the specific users whose data storage is long-term and of large scale.

Bottos will provide tokens as an incentive on its platform for those individuals or organizations who contribute the nodes and register its storage capabilities including capacity, interfaces, storage types, and corresponding Service Level Agreement (SLA).

3.4 Bottos Algorithm/Model Service

Artificial intelligence companies can register and publish algorithms or models through Bottos’ model market. Also, those companies can purchase the corresponding computing and virtual machine resources from the Bottos system to deploy the algorithm model, register the API accessing interface in Bottos, and launch it into model trading market with a fixed price. Then users can purchase the algorithm and model with tokens via API calls.

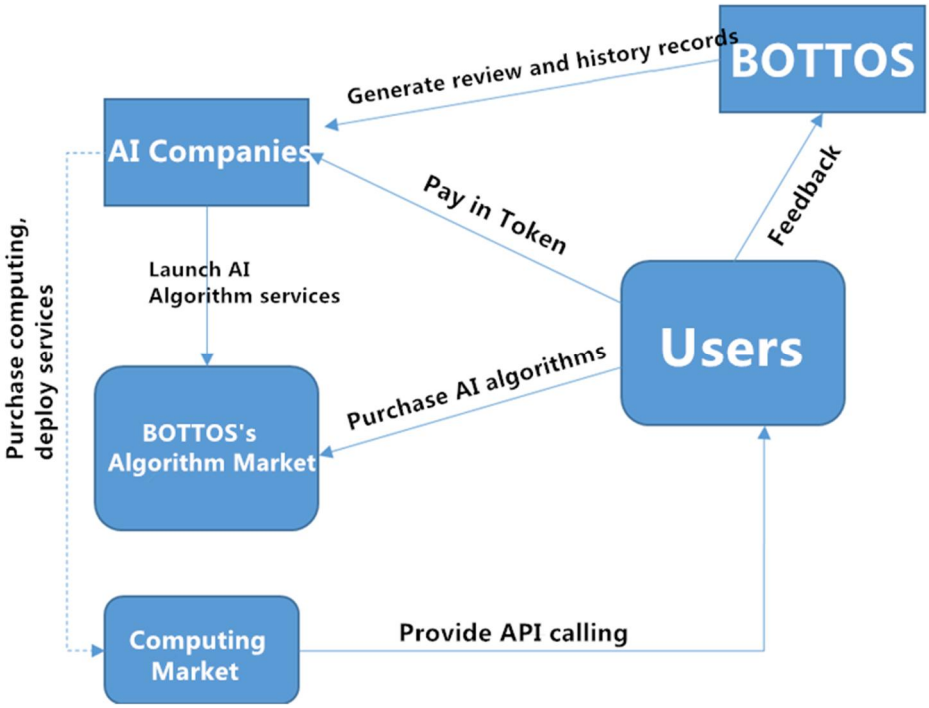


Figure 7: Bottos Algorithm/Model Service

3.5 Bottos' computing service

Machine learning, especially deep learning algorithms, costs a large sum of computing. At the same time, deep learning and neural network algorithm themselves require multi-node cooperative computing. The blockchain itself is exactly a decentralized computing resource, which features decentralization and incentive mechanism. It improves the management and sharing of computing resources and then builds a larger and more convenient computing resources pool by using the computing resources inside a data center, collaborating and sharing unused and scattered computing resources. Meanwhile, with the development of 5G and IOT, it's necessary to equip discrete computing resources such as edge computing and fog computing with a more extensive and reliable management network. Blockchain is able

to create a shared, transparent, and tradable computing environment to organize these resources. In short, a blockchain decentralized resource pool promises trustworthy and value-based management than can make better use of various computing resources from cloud computing resources to discrete computing resources.

3.6 Eco-Applications of Bottos: DApps

DApps Includes artificial intelligence, robots, Internet of Things and other strongly data-dependent application industries.

The application layer based on the core layer and service layer, mainly exists in the front end, in which some applications may be built by Bottos (such as location sharing), while others will be built by the community and third parties. We hope that the Bottos community can attract worldwide developers to build a variety of applications. Applications developed by third parties may charge additional fees or use other business models such as market making, information sales, or advertising. As put in the next section, many Bottos applications may take owning tokens as a core part of the business models. Bottos will be committed to creating a high-quality data circulation platform that helps AI, Insight and others to realize algorithm upgrades and model upgrades by simple plugging, and provide users with more and newer value.

3.7 Concept of Bottos Multi-Value System

Different trading products offer different values, which are hard to unify. That’s why multi-value comes in handy. Pricing it with a single token may distort the values, fail to reflect the value of the product reasonably, and interfere with each other. For example, if one type of token is used for the value of data and price of storage, the exchange between them could be unfair as data cost and actual storage cost may make a great difference. It can’t reflect the true cost with a token valuation, and when seeking for a unified price at their respective markets, will interfere with each other, which makes it hard to find a balance point for the different market capacity.

Ethereum's GAS, similar to fuels such as gasoline, is consumed in every transaction, namely, it is paid by each sides of the transaction. EOS adopts the “land lease” model that purchases system resources according to instantaneous or long-term use based on bandwidth and computations. While The Bottos' “GAS” design is similar to the sunlight-land model, in which a certain amount of sunlight, wind, rain, and so on are generated on per unit of land. Light, wind power and water here are all fuels for Bottos applications. We call this analogy design "Multi-value". In the Bottos system, the land area is the amount of BTO holdings and units of BTO can be mortgaged to generate a certain percentage of stable value, which is able to be integrated with the business entity.

Multi-value has the main characteristics listed below: first, the Bottos eco-

value can realize value exchanges on an atomic level; second, the atomic-level exchanges can happen between the Bottos ecosystem and other public blockchain ecosystem, that is to say, functional tokens such as storage tokens and computing tokens can be compatible with other ecosystems, and other main blockchains can also use Bottos's storage and computing resources; third, in the application layer, DApps can also realize multi-value for the DApp internal autonomy and integration with the business entity.

There are lots of resources on the earth, including the “land” of EOS and the “oil” of Ethereum. For Bottos, the sunlight, rain and wind on the earth are all resources. Although the sun emits light and heat infinitely during a certain period of time, the radiation on the surface of the earth is basically constant, so is the wind and rain. These resources, consumed by photosynthesis of green plants, transform wastes such as carbon dioxide into their own energy, nurturing the earth. This kind of ecology, on the one hand, coincides with Bottos's idea of converting "neglected" and "wasted" personal data into AI productivity that serves humanity. On the other hand, it can maximize the value of land (BTO) as the land is value-added not only due to its scarcity, but also because it makes “poor land into an oasis”. In a word, Bottos has a double-valued effect. (Details refer to the technical whitepaper.)

4 Application Scenarios

In the previous chapters of Overview and Design Concept of Bottos, a brief introduction has been made to the Bottos's application scenarios, including the fields of big data, AI, robots, IoT and so on. This chapter is mainly to further describe the application scenarios in order to better develop the economic applications of Bottos.

In recent years, AI has developed into the second stage that is driven by big data after finally conquering problems that have existed for decades. One of the key points, from Go to human speech recognition, is that AI has the ability to collect and learn massive amounts of data that lowers the error rate. Big data has completely transformed AI. Throughout several popular applications of AI (see figure below),a common characteristic is that a large amount of data has been accumulated for algorithm / model training in the Internet era, such as real-time trading data in finance, trading data in e-commerce, etc. :

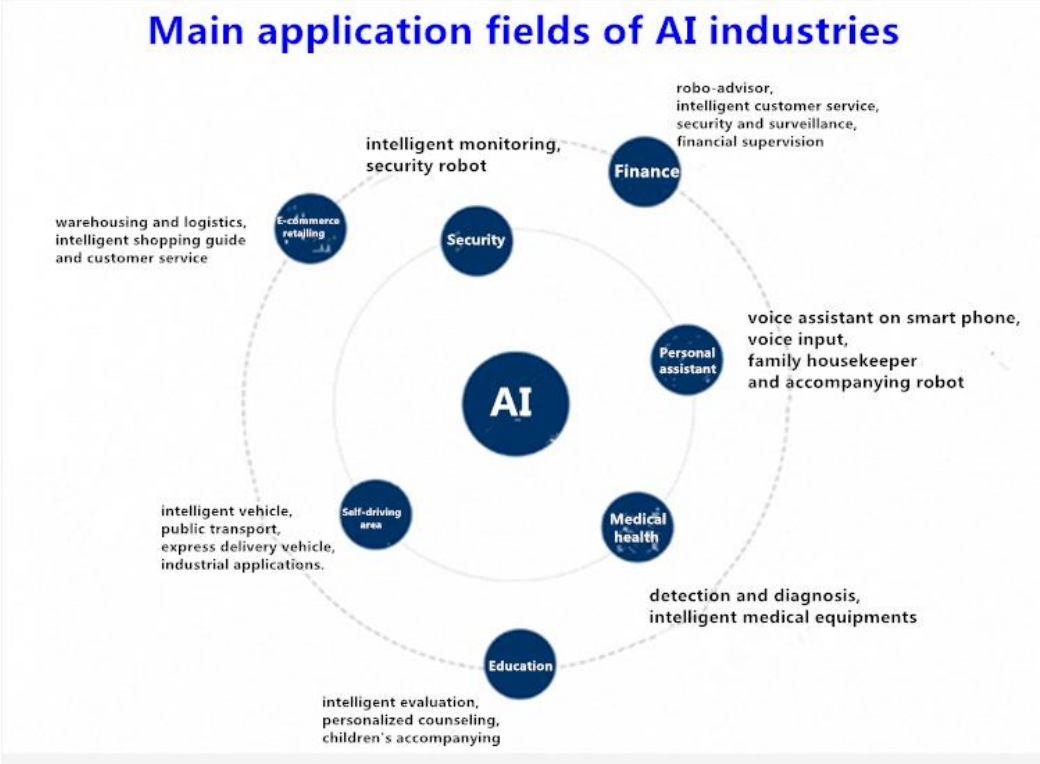


Figure 8: The application scenarios of AI in the second stage

In the previous abstract, we discussed the driving forces in the different stages of AI. We have moved from the first stage, when AI was driven by algorithms and computing, to the second phase in which AI is ignited by a large amount of structured and reliable data. While in the third stage, scenarios are the main driving force, in which case, AI not only can provide personalized services for users, but also execute different decisions under different scenarios.

For example, in the field of facial recognition, devices with this function are useless for frontier guards who must wear masks to prevent frostbite at 40 degrees below zero. Also, facial recognition requires individuals' photos of all ages, which are easy for everyone but rather difficult for web crawlers to

collect. Therefore, in the third stage, AI demands higher dimensions and quality of data collection and formulates different decisions according to different scenarios, in which case things will develop better and decision-makers hopefully have a deeper insight whose decisions can be more accurate.

4.1 Bottos and DApps

To serve the community and DApps is the criterion of Bottos public blockchain. The pioneering "DApps multi-value system" is implemented rapidly around the world to apply DApps into business in an intelligently derivative way. Data mining is also initiated to encourage data sharing, which can help users liquidate their unique data so that everyone is able to help boost AI.

4.1.1 Classification of DApps on Bottos

Bottos can deploy Dapps in a one-stop way. The categories include:

➢ Sidechain technology, lightning network, status channels and other blockchain technologies that improve the performance and scalability of Bottos public blockchain.

➢ Pure software of AI technologies like AI algorithm models.

➢ Other AI derivative technologies combining software and hardware like smart hardware, robots.

In addition to AI and its derivatives, big data and IoT can also

become nodes on Bottos, which is one of the essential links in the Bottos Ecosystem.

4.1.2 Bottos and DApp

AI companies can launch and deploy their own AI algorithms and models, and purchase the corresponding computing resources as well as data on Bottos. These companies will use the data for learning and training to deploy AI services and form their own DApps, so that they can gain revenue by registering services provided by DApps on Bottos and providing an interface for external users to access.

AI companies can also sell algorithms and models in the market to obtain the corresponding Token by direct transaction. Besides, they can choose to tokenize the services provided by DApp and issue their own tokens on the platform, so that consumers should pay specific tokens when using DApp services, in this way, these companies can realize financing and value their services.

4.2 Bottos and AI

As for AI, we hope one day that it can have insight and make decisions like a human. A human being is a collection of various abilities and born with fixed genes that can be analogous to the algorithm models of AI. When we are learning, we just input the data and our brains extract and store the rules. In this way, AGI can learn rules through certain data training as time accumulates by finding common learning modes or algorithms which are just

like human genetic genes.

At the same time, human learning is a coherent behavior. A simple ability learned before can be the prerequisite for the next skill to be learned, that is, iterate high-level modules are based on the junior modules. Therefore, artificial general intelligence needs to be fed with continuous training data, and of course, it can be piled up directly with different rules and modules that have been trained.

Bottos is such a platform that speeds up the data circulation, allowing isolated data and models to form a new accumulation, which can accelerate the coming of AGI.

4.2.1 Bottos and Artificial General Intelligence (AGI)

With the development of AI, people will have different opinions on the definition of AI that seems to be constant at present. For example, the automatic visual recognition of car license plates and the automatic recognition of handwriting were considered to be cutting-edge AI technologies 20 years ago; however, these common pattern recognition technologies in people’s subconscious are no longer advanced AI technology, or even AI technology.

Curiosity drives human infinite exploration of the material and spiritual world. People's curiosity and awe of strong AI (or artificial general intelligence, also called AGI) are based on the fact that AGI still has a long way to go. As advanced tools, AI and machine learning have greatly improved their

application effect due to the current methods based on probability statistics and search (Hidden Markov, Monte Carlo Tree and Bayesian networks), and those based on connectionism (various neural networks), as well as the tremendous improvement of computing. However, the current technology has not found the way to AGI. When AI develops to a certain stage, it may encounter a bottleneck once again if it only depends on the development mode of big companies and large organizations without a figure like Einstein that promotes the development of AI like the promotion of modern physics in the 21st century.

On one hand, although AI possesses powerful capabilities of computing, derivation, search, recognition and prediction, and the integration and amplification of them will enable AI to become a rational smart machine in the future, its lack of spontaneity and subjectivity, sensibility and conscious traits results in that AI looks far less “intelligent” than human pets--- cats and dogs’ "intelligence" has obvious life characteristics, which can’t be found in AI at present. On the other hand, since the mechanism of AI is different from that of the mammal, which is carbon-based material composition mechanism, we cannot impose some specific intelligence attributes of mammals on machines (The research on AGI partly starts with analyzing the neural mechanism of the brain). Therefore, the methodology for the exploration of AGI doesn’t rely on simulating human brains or the neural mechanisms of advanced mammals. When AGI that exists in the form of data is developing and strengthening continuously at the rational level, the characteristic of digital life’s intuition may be motivated. This inspired time node is scientifically known as the coming of

AI singularity, and its implementation can be briefly summarized in the Bottos ecosystem as follow: 1. Quantity change leads to qualitative change. Newer features and breakthroughs emerge in Bottos due to the global scale of the AI data and models collection pool; 2. Experts from the public rather than just one or two companies effectively influence the transition process.

4.2.2 Bottos and Speech & Semantic Recognition

Language recognition as the technique that converts language into text is a branch of natural language processing. The main steps of the foreground are divided into three steps: signal collection, noise reduction, and feature extraction. The extracted features are decoded in the background by the language model obtained by linguistic big data training, finally converting the language into text so that the machine can recognize and understand the aim of the language. At present, the maturity of language recognition technology can reach 95%, but the change brought by the accuracy from 95% to 99.99% is a qualitative leap, which will make people tend to use the language frequently.

As a kind of one-dimensional time domain signal, language recognition has two main difficulties in actual operation. The common difficulty/pain point in speech recognition is the cocktail party problem, that is, how to find signals that need to be identified among numerous noises and interference signals, which is particularly prominent and difficult to solve especially in the cases with very large noises and interferences. The first is the acquisition and cleaning of data. Language recognition requires the support of massive

standardized corpus data in specific fields, while the diversity of local dialects has particularly increased the workloads of corpus search. Through the Bottos platform, the data acquisition and cleaning can be completed directly point to point, and subdivision work can be achieved as well as corpus search workloads can be greatly reduced through economic incentives.

The second is the extraction of linguistic features, which now mainly depends on deep learning with a multilayer neural network equivalent to a feature extractor. This kind of extractor can achieve the maximum reduction of signal features by describing the characteristics of the signal layer by layer, from part to whole, general to concrete. On Bottos, many language recognition developers can create models of different language features according to their own preferences. Like minority languages, language recognition developers can take their own advantages to commercialize their personalized models they develop on this platform. In this case, many giants in the field will be interested to this, such as IFLYTEK CO., LTD.

Which dialect do you want Siri to say? And which is more convenient, Taiwanese, Sichuan dialect, Hunan dialect, Shandong dialect, Northeast dialect, or Mandarin? We know that the current languages that can be recognized by AI speech recognition are Mandarin and Shanghai dialect. Whether it is Apple Siri or Microsoft “Xiao Na”, a large number of AI companies need to collect a large amount of recorded audio for the development of dialect speech recognition. Bottos's high-quality data circulation platform can help developers quickly collect personalized dialect

corpuses and make the models quickly matured and improved by peer to peer and other better economic incentives, finally realizing business value.

Just like the speech recognition, Bottos's semantic recognition is similar to the decentralized Wikipedia, which is, making the AI model proven and sophisticated by peer-to-peer technology. The difference here is that Bottos is based on blockchain technology, which makes the data for model training credible and traceable, and everyone involved can share product value.

4.2.3 Bottos and Computer Vision

The main bottleneck of computer vision is that current image recognition technology can hardly solve the problem of incomplete, overexposure, and dark images due to the influence of a picture's quality and lighting environment. In addition, subject to the amount and quantity of marked data, it is difficult to make a breakthrough of current algorithmic iteration in the specific application scenarios without large-scale or high-quality subdivided application scenario data. High-quality models can be trained by high-quality data, which can be realized in Bottos. High-quality data can be collected via peer-to-peer technology and economic incentives on Bottos's platform, expanding the volume and quantity of tagging data and resulting in personalized computer vision model with better quality.

Similar to speech recognition, Bottos also obtains image data by establishing a peer-to-peer connection between developers and users. For example, many wild bird photographers have stored large amounts of high-

definition pictures in their own albums. Bottos works as a paid sharing platform, making it possible for individuals to liquidate their data and support the development of AI technology.

4.3 Bottos and Big Data

Data will be a new asset of companies, and personal data is also emerging as a new asset. Blockchain allows data to truly flow with “confidence”.

4.3.1 Bottos and Data Confirmation

Built-in identity authentication system, Bottos solves the unique problem of data asset through the registration of the blockchain to confirm the right. Big data companies can access Bottos as nodes to realize data confirmation, transaction, circulation and liquidation while guaranteeing data privacy and ownership.

4.3.2 Bottos and Data Authorization

Data analysis is the core of realizing data value. To effectively protect personal privacy and prevent leakage of core data is the primary solution in data circulation when analyzing data. For example, with the popularity of face recognition, fingerprint data analysis applications and methods of genetic data detection and analysis, more and more people are worried about the serious consequences of personal health data leakage.

Bottos can prevent this through encryption, digital signatures, distributed

intelligent storage and community governance. When the value data is hashed and placed on the blockchain, only authorized people can access the data on the static node with digital signature technology.

4.3.3 Bottos and Big Data Sharing

How can Bottos advance the yield of medical big data? Here is the typical illustration. Bottos gathers the power of the community and attributes the ownership of the data to the owners. Users can manage their digital assets with Bottos, such as personal electronic medical records (electronic format or photo & image data, etc.), which can be uploaded on users' local nodes with private keys' access restriction, avoiding legal restrictions on personal medical data. Another example is personal genetic sequencing, which can be be completed with distributed computing resources on Bottos at low cost. Bottos has a special security design for the data, allowing sequencing to become the solution of industrialization on a global scale, thereby advancing the massive growth of data. Big data companies can also accomplish one-to-many labor subcontracting in data cleansing and tagging through smart contracts by the data collection in Bottos's large community.

4.3.4 Bottos and Data Privacy Security

In the Bottos ecosystem, users' data can be stored on decentralized blockchain nodes and analyzed without accessing the original data through distributed smart storage, which can not only protect the data privacy, but also make it safely shared with scientific research institutes, and doctors worldwide. All of these make a basic human health database to battle sudden

and difficult diseases in the future. Anyone can independently manage their own data assets and provide an interface for their ledger.

Bottos strictly controls data fabrication and tampering with a design of multi-value system in its community governance, making a high cost for bad actors and widespread influence.

4.3.5 Bottos and Data Tagging

The cost of data tagging is very high in the current AI industry, which is time-consuming and critical in primitive accumulation. Bottos is just settling on this point and creating great industrial value through multi-role participation of community nodes, or types of "data crowdsourcing platforms" that may subvert the AI industry.

4.4 Bottos and Smart Hardware

Nowadays, smart hardware such as smart bracelets, watches, doorbells and door locks have entered into the public's vision, many of which are related to our lives and health. However, the data monitoring function of smart hardware is very weak, which is vulnerable to hacker attacks, such as smart door locks. Hidden dangers of smart hardware have caused accidents and disputes, which blocked the development of smart hardware. At the same time, the current smart hardware with a single function and weak user's viscosity, also restricts the development of the industry.

4.4.1Bottos and Data Sharing

Bottos is safer than any current database that relies on the central system because it can stop users' data from being kept on any intermediary or centralized server through no-centric nodalization of blockchain technology. The accessing of smart hardware into the Bottos system returns data ownership to the users who share their data, thus generating data's value. Namely, users can own the profit by participating in data sharing.

4.4.2 Bottos and Smart Hardware, Data Mining

Bottos pioneered a mining model of digital assets based on blockchain technology that allows users to earn digital assets through data mining. We have combined AI with hardware into AI derivatives. The role of hardware is the collection of new data. Therefore, in "data mining", the hardware is the "mining machine".

The scenarios with a combination of Bottos and smart hardware are numerous. Bottos allows users of smart hardware to participate more deeply in the construction of AI systems, which will effectively solve the problem of low efficiency and high optimization costs of AI self-accelerating AI development. For example, in the AI field, children's smart story machines can identify their dialogue scenarios, but the current overall development is relatively slow with a clumsy voice and semantic recognition. While after using the Bottos system, the project party of a children's smart story machine can transform the chip and encourage users to complete AI tasks such as using more of the voice conversation function to feedback the dialogue experience,

and to upload dialogues that they feel are good for enriching the semantic library. Any contributions like these will help users earn tokens which can be used to purchase more services and products.

The subversive point of this approach is to truly benefit the early adopters of the product. Traditionally, the birth of a smart hardware or robotic product requires a set of processes including prototype-product crowdfunding-make models and mass production-sales-updating-replacing. The more iterations of the product, the better the performance experience and the cheaper the price. The drawback of such a process is a limited early development of the product, which is obvious for the first batch of users who bought this product with a high cost and poor experience. However, with Bottos, the sooner the first users contribute their data, the sooner they'll get the AI tokens which means more earnings that can balance out the pre-purchasing cost.

4.5 Bottos and the Internet of Things

Similar to smart hardware, Bottos' decentralized structure ensures the security of the Internet of Things (LoT). At the same time, the distributed computing system can greatly reduce the pressure on the center's computing, and releases more possibilities of the organizational structure of the LoT, providing more space for innovation. Moreover, the decentralized approach stores the data in different nodes to ensure data security and prevent attacks such as DDOS. Besides, chaining into Bottos allows the participating parties to collaborate with multiple parties.

4.5.1 Bottos and Selection of Value Data

Here, the distributed devices of the IoT are used as data collection sites (as one observed point without active output), and those devices only count and verify the characteristics they have observed and use them comprehensively. In the Bottos system, valuable data will be selected so that there is no junk data to occupy resources. At the same time, Bottos makes it difficult to falsify data, making the data brought by the Internet of Things more accurate and effective.

4.5.2 Bottos and Sharing Economy

In Bottos, no longer considered as a point, the terminal device can actively participate in the resource entities of the Internet of Things, allowing more resource interactions and collaborations between terminals. Terminal equipment, as a participating node in Bottos, can provide resources such as storage, calculation, and data. In Bottos, terminals can be assigned to different owners through smart contracts and idle resources can be sold to obtain corresponding values with little additional cost, thus the sharing economy becomes more thorough.

4.6 Bottos and Intelligent Robots

Automatic control machines are commonly known as robots, which include all the machines that simulates human behavior and thoughts as well as other organisms (e.g. robot dogs, robot cats.). Robots consists of smart modules based on AI of which some specific skills are beyond humanity in a

sense. Paolo Dario, a professor from Santa Ana University in Pisa, Italy, gave a keynote speech at the 2017 World Robotics Conference, in which he pointed that the robots surely develop with a certain risk and may need to be regulated.

In essence, the robot is not a separate unit. On the contrary, it will become an interconnected robot group. We should treat them as "foreign entry" as the robots are increasingly advanced and powerful. Hence, it is necessary to be aware of the birth, the historical behavior records, and other information of each robot, as well as its genetic composition, and the directions in which its future iterations will take place.

The ultimate goal of Bottos is to realize the friendly collaboration between robots and humans in the future. The platform aims to help intelligent robots grow rapidly in a distributed manner at this stage. With Bottos, robots can realize the one-stop transformation to become a blockchain robot, achieving rapid iteration.

4.6.1 Bottos and Robot ID Cards

In the future, the number of intelligent robots will be larger than that of humans. It is absolutely necessary to identify and certify their information on what smart modules they contain and what data they are fed before the robots leave the factory, which paves the way for robots management and laws and regulations for robots.

Bottos' built-in ID management system is designed to be a robot "national

ledger", which works as Credit Archives for robots that consist of all-round information of each intelligent machine/equipment basis point, including robot's brand, its manufacturer traceability, fully transparent supply chain, peer-to-peer intelligent identification, credible identity verification, decentralized collaboration, smart data exchange, device Token transfer, and so on.

4.6.2 Bottos and Robot Transformation

Bottos is designed to help robots realize blockchain transformation. Here is the feasibility listed in the four main points:

First, robotics start-ups launch crowdfunding on Bottos to raise the first round fund for model production in the way of basic tokens on Bottos, as well as issuing their own Bot Tokens. Some key information of the products will be totally public on the chain and each robot will has its own ID.

Second, robotics start-ups design its products as data collector that is conducive to the iteration of products. When users use the robots and sell the data to the start-ups, it constitutes “data mining”. With Bottos' economic incentives, start-ups can quickly obtain valuable data for product improvement.

Third, users can use the acquired token to purchase other services provided by the company or the next generation of products. Token can also be exchanged at Bottos' built-in decentralized exchanges and used to purchase other services in the Bottos’ system. Tokens play a role in anchoring

the value data circulation and model iterations throughout the entire process, in which case a tokens value reflects the overall market value of start-ups and their products.

Finally, according to the collected data, the start-ups can keep feeding and designing new AI modules, to improve product performance, enhance user experience, as well as realize blockchain transformation of robot products.

5 Bottos Governance Structure

5.1 Establishment of the Bottos Foundation

The Bottos Foundation (hereinafter referred to as the "Foundation") is a non-profit organization, which is committed to the development and construction of Bottos, as well as the advocacy and promotion of governance transparency, to promote the safe and harmonious development of the open-source ecological society. The Foundation will help to manage the general affairs and privilege issues of open-source community projects through the establishment of a good governance structure.

The governance structure is designed to ensure the sustainability of the community development, the effectiveness of fund management and the security of fund raising. The Foundation consists of team members and functional committees. The organization structure is mainly composed of a decision-making committee, a code audit committee, a financial & personnel management committee, and a marketing & public relations committee.

In the early stage of the foundation, the decision-making committee consisted of the chairman of the foundation, core team members, and private

equity members, each with a term of two years.

5.2 Governance Structure of Bottos Foundation

The governance structure of the Foundation covers operational processes and rules for daily routine and special situations. This section will elaborate the responsibilities of the Foundation's functional committees.

Decision-Making Committee

The Foundation establishes a decision-making committee of which functions include the appointment or dismissal of executive officers and the heads of functional commissions, the formulation of important decisions, the holding of emergency meetings, etc. Both the members of the decision-making committee and the chairman of the Foundation serve a two-year term.

Once the term expires, 50 community representatives will be voted on by the community according to a weight based on the number of BTO and the coin age, from which 11 core members of the decision-making committees will be selected by ballot. The selected core personnel who is to make important and urgent decisions on behalf of the Foundation, are supposed to accept credit investigations make the pay public during their terms.

Any of the following issues must be voted by the decision-making committee through the open ballot. Each member of the decision-making committee shall have one vote and the chairman of the foundation shall have two votes. The resolutions made by committee will only be valid with at least a simple majority of votes:

1.To modify the governance structure of the Foundation;

2.To appoint and dismiss executive directors and the heads of functional committees;

3.To make crucial decisions;

4. To appoint or dismiss members of the decision-making committee during their terms, such as violation of the scope of their functions, laws, administrative regulations and voluntary resignations as well as other emergencies; events affecting the entire community like software security, Bottos system upgrade, etc.

In addition, the executive director shall convene an interim meeting among the decision-making committee within 5 working days, when one of the following circumstances occurs:

1. The chairman of the Foundation deems it necessary;

2. More than one third of the members of the decision-making committee jointly propose;

3. The executive director proposes

All members of the decision-making committee shall attend the committees' meeting in person. If someone is absent due to any reasons, he or she shall entrust other representatives of the committee. Any absent members without sending a representative to attend, will be assumed to waive his voting right.

Executive Director

The executive director, elected by the decision-making committee, ought to be responsible for the daily operation and management of the Foundation, the coordination of subordinate committees, hosting of decision-making committee meetings, etc. The executive director shall report to the decision-making committee on latest work status regularly.

Application Committee

The application committee is responsible for screening suitable industries and applying Bottos technology into industries and projects for commercialization.

Code Audit Committee

The code audit committee consists of the core developers from the Bottos team and is responsible for the development of the underlying technology, open port development and auditing, and various product development and auditing. In addition, product developers hold weekly meetings to track project progress and propose requirements. Members of code committee will keep pace with the community and maintain close contact with Token holders in the community, and technical seminars will be held from time to time.

Financial & Personnel Management Committee

The financial and personnel management committee is responsible for the use and audit of raised fund, compensation management of developer, audits of daily operating expenses, etc.

Marketing &Public Relations Committee

The goal of the committee is to serve the community and be responsible for promoting the Bottos technology, products, open source projects, etc. In addition, the committee is also responsible for external announcement management. Once something that does damage to the foundation’s reputation happens, the committee shall respond to the public after the internal audit and assessment.

5.3 Human Resource Management of Bottos Foundation

Bottos is committed to creating the world's most influential open-source community ecosystem. To ensure a smooth development of technology and a sustainable and effective operation, the Foundation will recruit top-class developers and management talents, which is different from the recruiting process of traditional enterprises and other non-profit organizations.

Recruitment

Following the principle of “competition, merit and experience”, the Foundation strictly implements a recruiting process which includes the interview with two or more interviewers, background investigation (such as working experience, business benefits, etc.), employment approvals, probation system, etc.

Some management functions such as finance, legal affairs, and taxation will be outsourced. All human resources outsourcing agreements shall be documented with finance and personnel management committee and the chairman of the Foundation.

Bottos, as an open-source community, not only recruits dedicated developers, but also employs well-known technology consultants in the industry. Terms of cooperation relating to the employment and compensation payments shall be approved and signed by the decision-making committee, foundation code management committee, and finance and personnel management committee.

Performance Assessment

Decision-making committee personnel shall participate in the annual performance assessment, which mainly include fund operation of foundation, fund management status, community coordination work, etc. The due diligence on the performance will be conducted annually with a job rotation system. The member of the next decision-making committee is to be selected by the community ballot within three consecutive terms.

The foundation formulated compensation management and performance appraisal systems as its developers come from different countries, full-time or part-time. Developers need to regularly report on work progress and exchange development process individually, which will be assessed by the code management committee. In addition, due diligence will be conducted annually.

5.4 Risk Assessment and Decision-making Mechanism of Bottos Foundation

Bottos foundation establishes and improves the risk management systems and regulations for an annual safety assessment of its sustainability. The assessment includes project quality, project schedules, project applications, such as the application of smart contracts and data investment contracts, threat identification analysis, assessment analysis of controlling measures, risk definition, disposal, etc.

The foundation will make decisions in terms of priority which is classified according to the characteristics of events, such as the influence of the even concerning to its depth and extent, the amount of Tokens affected, and the probability of occurrence. Relevant committees of the Foundation will cope with the events of high priority as soon as possible. The event here are mainly divided into management type and code type:

1. The Foundation's general management affairs, will be discussed in meetings by its members, and finally will be jointly decided by the financial & personnel management committee and the chairman of the Foundation.

2. Decision-making for the issues of open-source community's code and the use of raised funds, will usually be conducted via a member voting mechanism, in which each member here votes through the foundation's voting system according to the number of BTOs held and absolute voting weight of the coin age. The result of the voting, working as a reference, plays a guiding role in solving these issues while the final decision will be up to decision-making committee.

3. Decisions on emergencies (such as software security, system upgrade, and other events affecting the entire community.) are reviewed by the code review committee and then submitted to the decision-making committee, followed by a voting. The decision-making committee will implement the voting

result into the community through a privileged mechanism. Any disagreement here shall subject to the decision-making members' voting right based on BTO numbers and coin age.

5.5 Financing of the Bottos Foundation

The Bottos Foundation's financial management team is responsible for daily financial management and digital token management. The daily financial management will be outsourced, including travel expenses of developers, staff payroll, house rents, daily expenses, etc.; digital assets management will be charged by authorized personnel of the decision-making committee, including wallet management, receipt of digital assets, exchange with other digital currencies, cash out of digital token, etc.

Sources of Funds

The Foundation will not generate large revenue in the early stages, of which the main revenue comes from private equity and sales of BTO. Participants need to use BTO as service fee to obtain partial use rights to Bottos and DApps.

BTO Distribution Plan

The distribution plan for BTO is as follows: the team accounts for 12%, and community ecological construction will represent 37% as well as a circulation percentage of 51%.

Restrictions on the Use of Funds

According to the above distribution principles and wallet addresses, the BTO will be used openly and transparently. During this use process, the flow of digital assets shall be supervised and shared with the community regularly by the custodian institution.

Using Principle of Public Sales Revenue

1.Over 50 BTCs shall be approved by the Financial & Personnel Management Committee;

2. Over 100 BTCs shall be approved by the decision-making committee.

Report on Financial Planning and Execution

The financial and personnel management committee shall submit a financial report which develop financial planning and conclude the previous quarter's financial performance quarterly, to decision-making committee for audit.

Digital Asset Management

The digital assets of the Foundation are under the responsibility of the authorized personnel of the financial & personnel management committee, who will make transaction records and ensure its safety and accuracy via multiple signatures. All collected legal tender should be exchanged into digital token in time and deposited in a digital wallet. Foundation assets are banned to be deposited into personal accounts.

Digital Wallet Management

Bottos Foundation's wallet takes 3/4 multiple signatures due to the principle of independence. Additional signatures shall be approved by the financial & personnel committee. Cold storage shall be adopted for large number of Tokens whereas multiple signatures shall be implemented for small number of Tokens.

Issuance and Management of BTO

Holders of BTO have the right to use Bottos and DApps thereon.

Disclosures

The Foundation will make a report to the community annually, including the development of Bottos, the operation of public blockchain, the use of BTO, and whether the foundation’s operation complies with the governance charter.

5.6 Other Issues and Legal Affairs

Legal Affairs

The Foundation will be officially established overseas, and legal affairs consulting shall be confirmed by the local lawyers.

Exemption clauses

The Foundation aims to turn into a non-profit organization, in which the users on the chain only acquire use right. Buyers shall understand that BTO makes no warranty within the law, either explicit or implied, and BTO is purchased "As-Is." In addition, the purchaser shall understand that BTO will not be refunded under any circumstances.

Dispute Settlement Clause

If there should be any dispute, the parties concerned should settle it in accordance with the agreement through negotiation. In case negotiation fails, it subjects to legal channels.

6 Introduction of Bottos Team and Development Planning

6.1 Bottos Team Introduction

Leadership Team Introduction：

Tingting Wang, a serial entrepreneur and the founder of the BOTTOS project. She is also a blockchain expert and an AI geek who has multiple experiences in robot exoskeletons, smart home and other R&D fields. She was the vice president of a blockchain benchmark project in China and the vice president of Screaming Technology. Tingting holds a BS in Computer Science from Huazhong University of Science and Technology and BS in Project Management from Wuhan University.

Xin Song, the co-founder and CEO with 13-year-experience in corporate digitization strategy field, who is one of the pioneers in application of big data and AI technology to improve traditional industries in China. He was the head of Droege Group China, one of Germany's largest family-owned investment groups, and helped dozens of European and Chinese traditional companies to achieve their Internet and digital transformation. He also led the transformation of the Internet and AI of the US personal insurance business of Liberty Insurance Group, the third largest property insurance company in the United States. He holds a Master of Business Administration from Georgetown University in the United States and a Bachelor of Management Information Systems from Shanghai University of Finance and Economics.

Chao Wang, co-founder and CTO of Bottos, served as the leader of R&D team in large tech companies like Wanxiang, Huawei, ZTE, etc. He is an excellent technical expert in the field of blockchain who is engaged in

distributed systems, cloud computing, communications standard design, research and planning over 10 years; Chao graduated from Hefei University of Technology, majoring in computer applications.

6.2 The Timeline of the Bottos Project

Bottos Project Launched: October, 2016.

Bottos Project White Paper Released: May, 2017.

Bottos Feasibility Verification Completed and DEMO Show: July, 2017.

Bottos Code Open Source: September, 2017.

Bottos 1.0 release: November, 2017

Bottos 2.0 release: March, 2018.

Bottos 3.0 officially to be launched: May, 2018.