



AICON

Whitepaper

ver 1.1

AIDAPPS Co., Ltd.

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1. Introduction

In the existing 3rd Industrial Revolution, the Internet was a key technology based on various information exchanges, and the 4th Industrial Revolution is characterized by the creation of numerous data and meaningful information beyond this. The main entity of data production has expanded from people to things, and many of the data produced in this way is accumulating in large-capacity storage, and meaningful and useful information is being produced from the accumulated data. The data economy, which is the core of the 4th Industrial Revolution, is a term that means that data has economic value.

In this respect, big data plays a central role in the 4th Industrial Revolution. Big data refers to a huge set of data that cannot be handled by existing management and analysis systems, and has characteristics called 3V such as Volume (data size), Variety (data acceptance), and Velocity (fast processing and analysis of data). Such big data can be used to solve various business problems that could not be solved before, and it can be said that it is leading the data economy by quickly analyzing large volume of various data and providing meaningful and useful information.

Here, it is necessary to pay attention to the diversity of data because it is linked to artificial intelligence (AI) and big data as a medium, which allows AI to implement the diversity of big data. Validity and Veracity have been added as a correlation between the two technologies from recent years. Validity means that big data must provide correct data, and Veracity means that the data provided by big data must be reliable. As a technology that can complement these two characteristics, blockchain can be an alternative.

Blockchain is a technology that aims for peer-to-peer (P2P) transactions in which all network participants record and manage transactions of ledger data that records transaction information, not on central servers. Whereas the existing system records and stores information in central servers, in a blockchain based on the P2P method, Veracity can be guaranteed while preventing data manipulation because information is stored in blocks and shared by all participants.

In this way, blockchain can maximize synergy by combining it with AI while allowing data Validity and Veracity. The blockchain reveals the data sources that AI analysis is based on, and allows them to certify that the data is trusted by consensus. Not only that, but more importantly, it is possible to implement AI analysis technology on a decentralized network base. However, in principle, blockchain holds all data shared by participants, and this enables AI to be used individually. In the existing central system, all data is stored in one computer or cloud and analysis is performed in one place, whereas in a blockchain environment, analysis results can be shared and received, so the scope of analysis can be determined by participants. As such, the convergence of blockchain and the AI technology is making a paradigm shift in a broader direction.[1]

The AICON Project aims to be an AI blockchain based on a distributed cloud (Decentralized Cloud) network environment. To this end, we build an ecosystem that supplies hardware constituting a distributed network environment, reward nodes that lend computing resources of hardware, and builds various service platforms that operate on a distributed network basis. More specifically, the basic idea is a distributed cloud system that borrows idle computing resources such as CPU, GPU, MEMORY, and STORAGE of nodes over a distributed network through Horovod-based supercomputers, and pays the AICON Token as a reward. In addition, the first purpose is to enhance security and reduce data processing costs by providing a distributed cloud environment combined with blockchain to developers, individuals, and companies (institutions) to store, manage, and process data in a decentralized environment. Second, it combines blockchain technology with the AI technology to make it easier for all developers, individuals, and companies around the world who need AI analysis and development to use the AI technology such as deep learning and machine learning through a user-friendly web environment.

In this way, the AICON Ecosystem utilizes the existing proven global AI

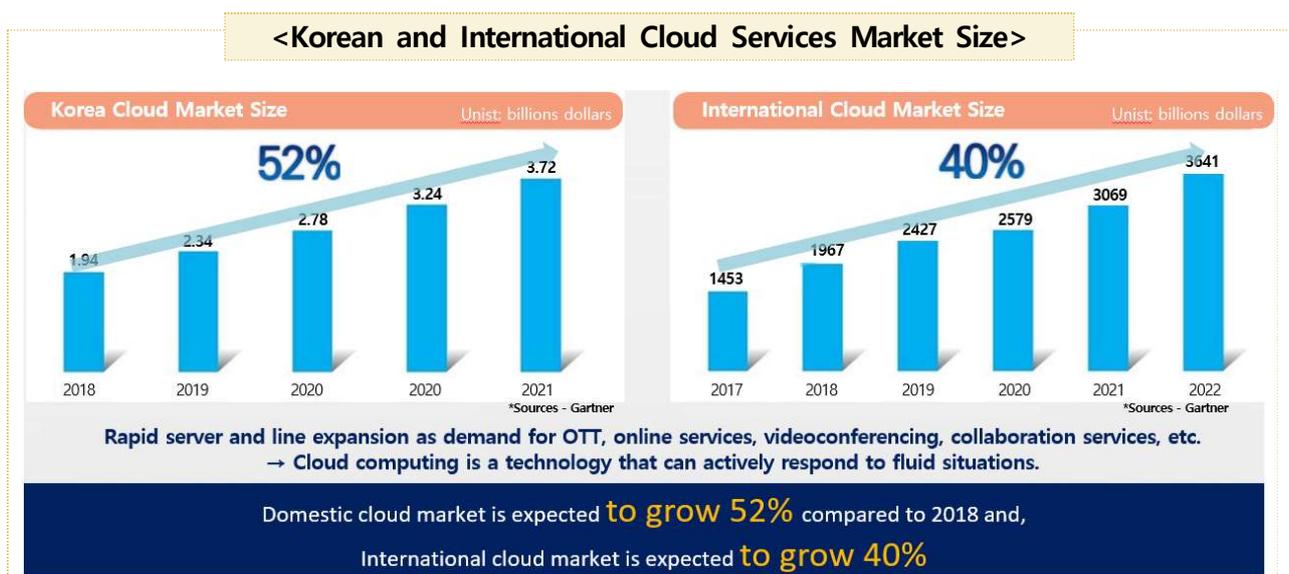
frameworks so that many consumers can use AI in their work or business more familiarly, so that individuals can strengthen their work capabilities, companies can increase their productivity, and many platform developers can develop according to their own platform concept. Through the convergence of blockchain and the AI technology, the synergy effect is maximized, and the foundation for growth as global AI blockchain companies is being strengthened.

2. Cloud and Artificial Intelligence (AI) Market Trends

2.1 Korean and international cloud service market trends

In Korea, it is expected to increase from KRW 2.3427 trillion in 2019 to KRW 3.7238 trillion in 2022. In particular, by service type, Software as a Service (SaaS) is leading the growth of cloud services to the extent that it accounts for the largest share at 44%, and Infrastructure as a service (IaaS) and Platform as a service (PaaS) occupies 21.9% and 13%, respectively.

The size of the global cloud market in 2022 is also expected to reach \$364.1 billion, and it is projected to grow at a high rate of 40% compared to 2017. By service type, SaaS accounts for the largest share at 42%, while IaaS and PaaS account for 18% and 15%, respectively.



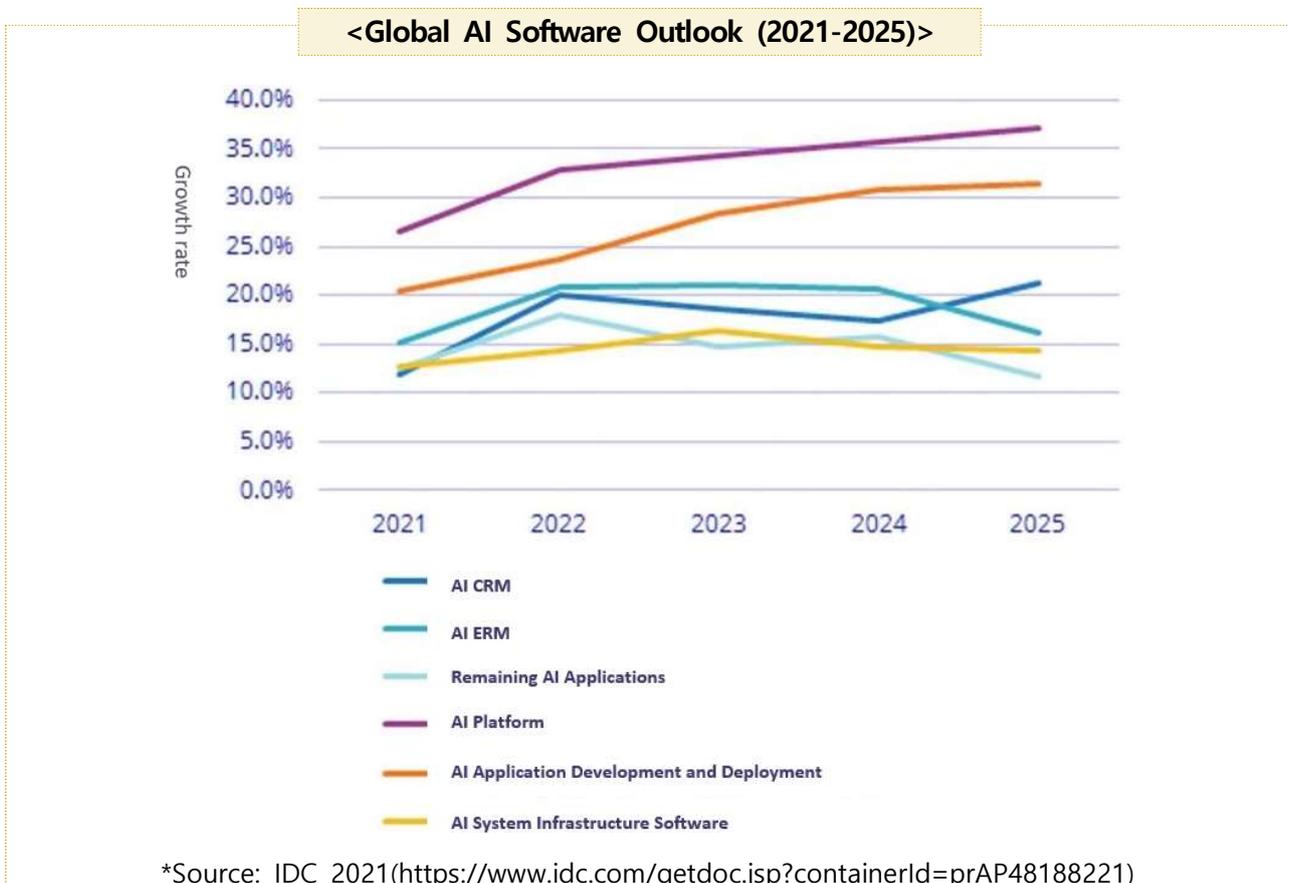
According to Gartner, a global IT consulting company, the market size and growth of cloud services are expected to be about three times that of the total IT service growth by 2022. The global public cloud market is continuously growing at an average annual rate of about 17.6%, and the Korean cloud market is growing rapidly at an annual rate of 20.5%.

As above, the cloud, which has emerged as a key factor leading the 4th Industrial

Revolution, is becoming more important as it interlocks with information and communication technology. To analyze big data or learn AI, there are so many processes are handled simultaneously, which is made possible by the cloud.

2.2 Artificial Intelligence Market Trends

As the global AI market grows rapidly, it is rapidly emerging as a key technology that leads to innovation in the business ecosystem. According to a report released by International Data Corporation in 2021, global AI revenue is expected to reach \$341.8 billion in 2021, an increase of 15.2% from the previous year, and the market is expected to surpass \$500 billion by 2024, recording a CAGR of 18.8% in 2024. IDC divided the AI market into software, hardware, and service markets, and although the AI software market accounts for 88% of the overall AI market, the AI hardware market is expected to show the fastest growth over the next few years in terms of CAGR. From 2023, it is predicted that the AI service market will grow the fastest.[2]



By market segment, AI applications account for nearly 50% of sales in the AI software market, AI platforms are expected to record the highest Compound Annual Growth Rate (CAGR) at 33.2% over five years. Although AI system infrastructure software is expected to show the slowest CAGR at 14.4%, it will account for about 35% of total AI software sales. In addition, within the AI application market, AI ERM (Enterprise Resource Management) is expected to grow slightly over the next five years than AI CRM (Customer Relationship Management), and AI lifecycle software is expected to grow the fastest in the AI platform market.[2]

The AI service market recorded \$19.4 billion in 2020, showing the steepest CAGR, beating hardware and software. In 2021, it is expected to grow at a CAGR of 19.3%, maintaining a CAGR of 21% over the next five years and continuing to grow rapidly. The AI service market is divided into two categories: IT service and business service, and the IT services are large enough to account for about 80% of total AI service sales, and both markets are expected to show a 21% CAGR over the next five years. IDC predicts that the AI service market will become a \$50 billion market in 2025.[2]

<Global AI Software Outlook (2021-2025)>



Top 3 Companies by AI software Market in 2020

AI Software Market	Type	#1	#2	#3
AI Platform	AI Centric	Palantir	Microsoft	IBM
AI Application	AI Centric	IBM	OpenText	Slack
	AI non-Centric	Microsoft	Google	Workday
AI System Infrastructure Software	AI Centric	IBM	Microsoft	Dynatrace
	AI non-Centric	Microsoft	VMware	McAfee
AI Application Development and Deployment	AI Centric	Google	Microsoft	Oracle
	AI non-Centric	Microsoft	ESRI	Teradata

*Source: IDC2021(<https://www.idc.com/getdoc.jsp?containerId=prAP48188221>)

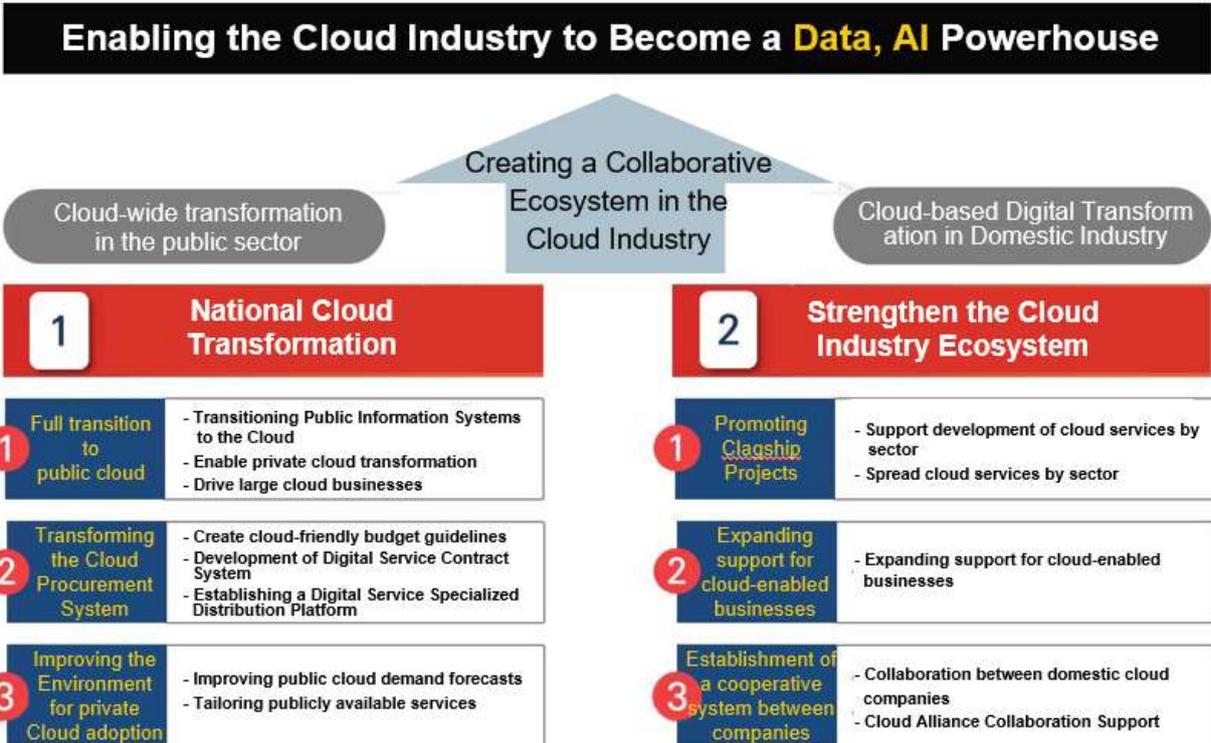
2.3 Relevance to Government Policy and Implications

In 2015, Korea enacted the World's First Cloud Computing Development Act to lay the institutional foundation for revitalizing the cloud industry. On June 24, 2020, Korea deliberated and confirmed the "Cloud Industry Development Strategy for the Data Economy and Artificial Intelligence Era" at the 16th meeting of the Presidential Committee on the Fourth Industrial Revolution and launched TF to establish the "3rd Basic Plan for Cloud Computing Development (2022-2025) in February 2021." To "revitalize data and artificial intelligence," the first of the key tasks of the digital new deal promoted by the government, the cloud is paying attention to the use of data in the age of artificial intelligence and the revitalization of the economy after COVID-19 such as the goal of training 10,000 professionals and data collection, accumulation, and utilization designed as the cloud.

The second key task is to completely shift the cloud to the public sector in accordance with the "national system cloud transformation" and to improve the environment for introducing private cloud. Third, with the core goal of "strengthening the cloud industry ecosystem," the main policy tasks are to expand the size of SME's cloud introduction, spread cloud services by industries, and expand support for use companies.

Although the domestic cloud use rate (12.9%) is far below the OECD average (30.6%) compared to the size of the market, the government is encouraging the cloud industry to continue to grow with measures such as "full transition to the cloud in the public sector," "innovation of the cloud procurement system," and "improvement of the private cloud introduction environment" through policies such as the enactment of the Cloud Computing Act (March 2015) and establishment of the cloud industry development strategy (June 2020).

<Government's Cloud Industry Vision and Goals>



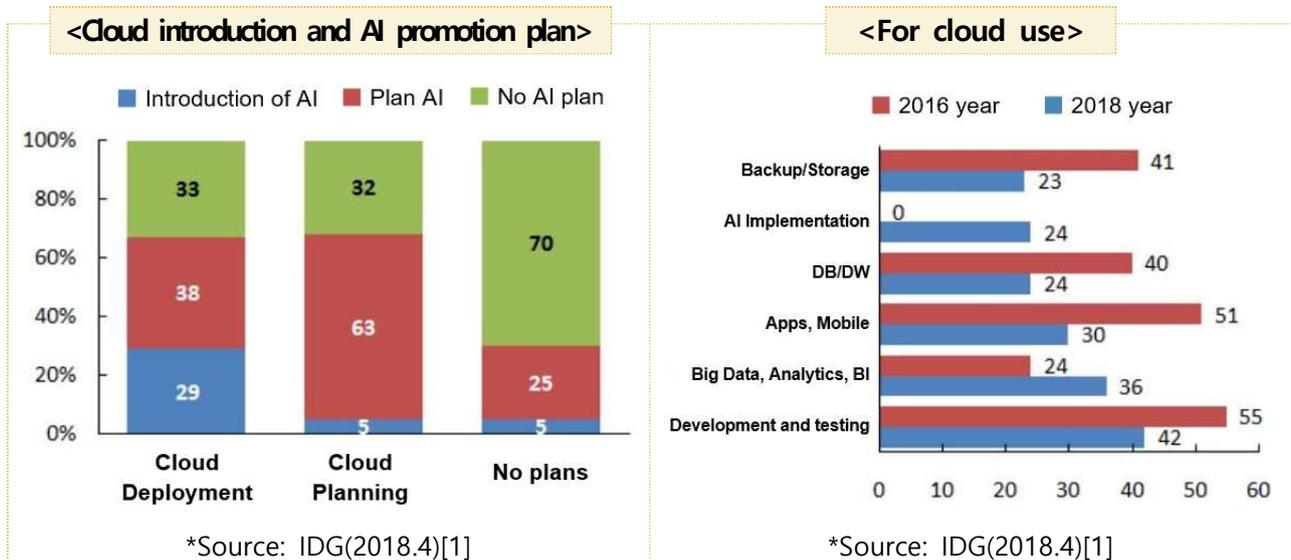
*Source: Cloud industry development strategy (draft) reorganization, resolution no. 1 of the 16th 4th Industrial Revolution Committee

2.4 Changes in the Cloud Market

The purpose of cloud adoption by companies is changing from IT management efficiency to big data analysis and AI development. [3] The cloud is a basic infrastructure that provides vast computing resources necessary for the development and utilization of artificial intelligence, which is why Amazon, Microsoft, Google, IBM, Alibaba, and Tencent, which are leading the AI field, lead the global cloud market. According to a survey by IDG, 67% of companies that have adopted the cloud have introduced or plan to adopt AI, while companies that did not have plans to introduce the cloud had little interest in AI.

The cloud utilization of Korean companies is changing from application development and testing to big data analysis and AI implementation. Comparing the surveys conducted by IDG Korea in November 2016 and March 2018, the number of Korean companies using the cloud for AI implementation and big data-related tasks increased. It increased from 24% in 2016 to 36% in 2018 for big

data and analysis purposes, and increased from 0% in 2016 to 24% in 2018 for the purpose of AI implementation.

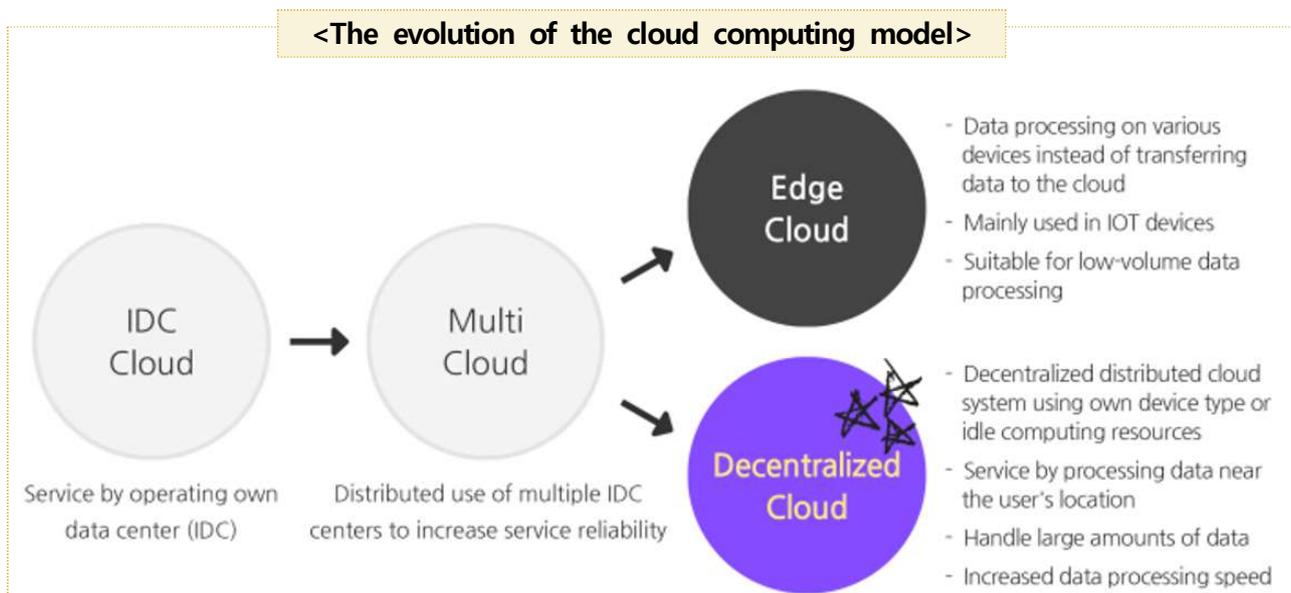


Over the past 10 years or so, the focus of public cloud computing technology has been on deploying large centralized data centers (IDCs) with thousands or tens of thousands of servers. In other words, it was to distribute the service request to multiple physical servers by installing services that need to be expanded after adding hardware servers. Later, with the introduction of Virtualization technology, it responded by expanding virtual servers, not physical servers. Although this was successful in economically expanding the cloud service, there were also disadvantages. For example, if tenants are unable to replicate cross-area services due to failures in the Availability Zone, service interruption occurs, and privacy and compliance issues occur due to the use of remote data centers.

For this reason, Gartner selected the distributed cloud as one of the nine major strategic technology trends for 2021. The distributed cloud is an extended form of cloud computing technology and is a model that enables rapid provisioning of cloud services by quickly provisioning services in a cloud close to cloud service users through the cloud formed in the edge network close to the cloud service users. [4]

The distributed cloud may be hierarchically distributed to provide cloud services centered on cloud service users. Various types of distributed and deployed mass cloud nodes are integrated as cloud resources, and the connection between each node occurs autonomously, so service and resource expansion are made by themselves. In addition, cloud nodes are deployed in a wide range of areas based on network nodes, allowing cloud services to be provided geographically close to users, and providing real-time services to users by reducing bottlenecks to the central cloud. [4]

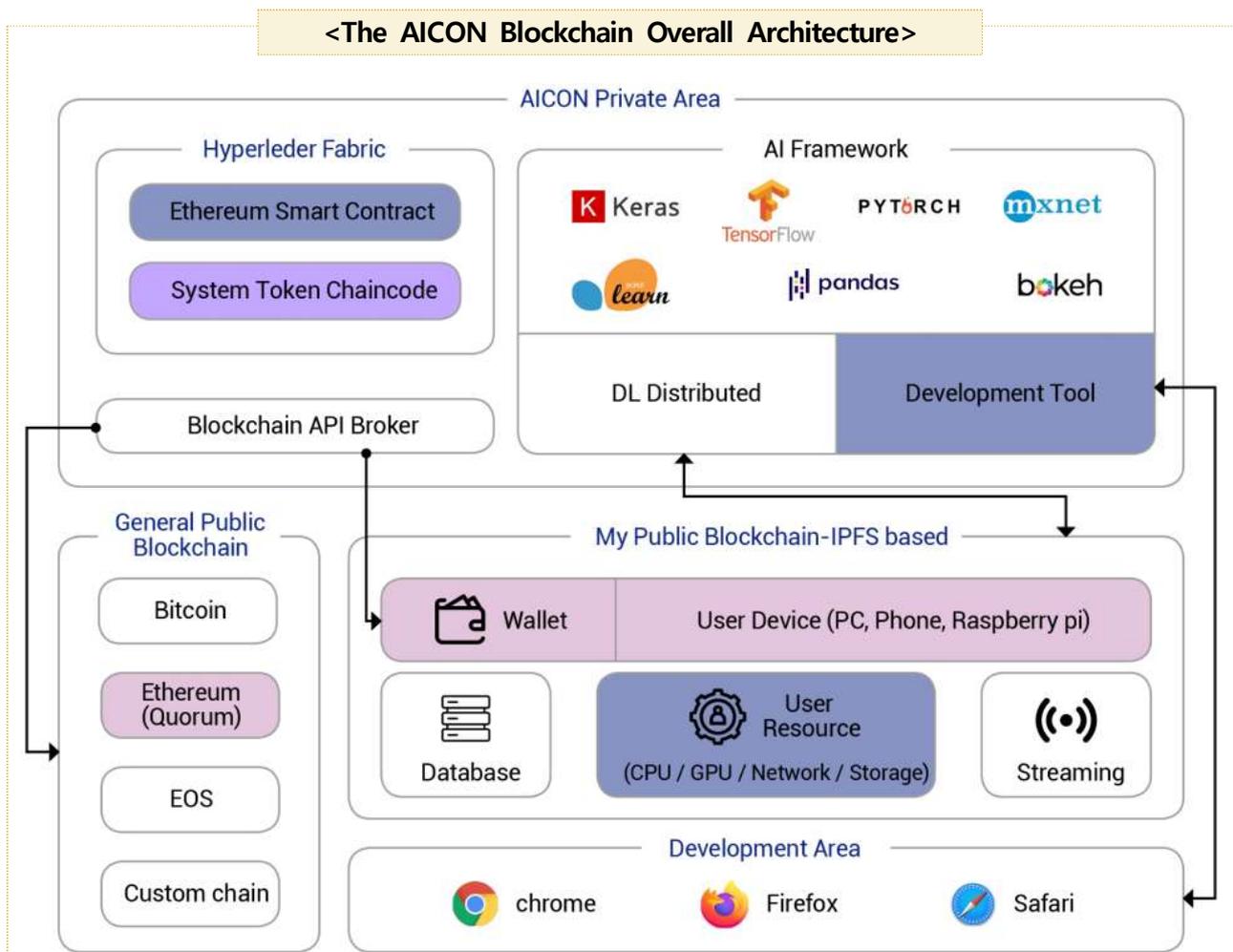
As explained above, with cloud and AI becoming a global trend, the AICON Ecosystem aims to ensure that all business models run in this distributed cloud environment as a way to overcome the limitations of centralized management of the cloud. It can compensate for shortcomings such as high costs, slow data processing speed, data forgery & manipulation, and leakage that occur in centralized processing methods.



3. The AICON Blockchain

Blockchain can be divided into several categories depending on the purpose of use. First, the public blockchain is an open blockchain that anyone can participate in and the transaction details are disclosed to everyone, so it is highly reliable and approved by all nodes, but it has the disadvantage of slow processing. Typical examples include Bitcoin and Ethereum. On the other hand, the private blockchain is a closed blockchain that only participates in nodes approved by the service provider and does not need to seek verification of other nodes, so the processing is much faster. Representative examples include Linq and Mijinof NASDAQ.

The AICON Blockchain has a hybrid blockchain structure that combines the public blockchain and the private blockchain to utilize fast processing performance and scalability based on decentralization.



The overall architecture of the AICON Blockchain is largely divided into two areas: 'AICON the private blockchain' and 'My the public blockchain' based on Inter Planetary File System (IPFS) as shown in the figure above. In addition, 'My public blockchain' can support open blockchains such as Bitcoin and Ethereum through Blockchain API Broker within the AICON private blockchain area.

3.1 AICON Private Area

The AICON private blockchain area was largely composed of three types: the Hyperledger Fabric, the AI Framework, and the Blockchain API Broker. Server redundancy (HA) that provides the Hyperledger Fabric is installed as a standard, and Ethereum Smart Contract and System Chaincodeon EVM (Ethereum Virtual Machine) in the Hyperledger Fabric through the Blockchain API Broker) was combined and implemented. These two types of contracts were applied to enable system compatibility with the Hyperledger Fabric and a number of Ethereum platforms.

In other words, the AICON Blockchain communicates with the outside through the Blockchain API Broker so that it can be applied in a variety of ways by selecting from the two contracts according to the type of target work required by external developers and users. Therefore, it can be applied even when fast data processing is required, such as payment and asset management services, and in particular, developers who program with development editor linkage and the AI Framework, as well as companies and the general public, can easily use AICON solutions as an open platform service.

The AI Framework is composed of a three-layer deep learning framework. The first layer consists of the Python deep learning API Keras, the second layer consists of Google's Tensorflow, Facebook's Pytorch, and Amazon's Mxnet, and the third layer consists of ONNX (Open Neural Network Exchange) to allow models to be shared among the world's top three AI frameworks. In addition, the HorovodFramework was built in to enable distributed training using Multi-GPU.

Deep learning is performed using Keras, Tensorflow, Pytorch, and Mxnet in the first and second layers, and machine learning is performed using Scikit-learn, Pandas, and Bokeh in the second layer. Looking at each library, Scikit-learn is in charge of machine learning, Pandas performs manipulation and analysis of data, and Bokeh performs statistical analysis and data analysis of machine learning/deep learning while performing data visualization.

3.1.1 Horovod

Horovod is a framework that supports distributed learning using Multi-GPU in Keras, Tensorflow, Pytorch, and Mxnet. If you use Horovod, you can easily implement distributed learning by adding a small amount of code. The AICON Blockchain is linked to utilize Horovod in the third layer. Horovod operates in Ring-allreduce method with optimized bandwidth usage based on Bandwidth Optimal All-reduce Algorithm Paper. [5]

As for the overall operation method of distributed learning, one worker process per GPU has a model to learn, reads a certain amount of data and calculates for each model training. In more detail, each worker has a model, reads training data, and finally calculates gradients for model update through Forward and Backward. After that, gradients are exchanged with each other in a ring-allreduce method, and each worker updates the model using the average of the collected gradients. [5]

The AICON Blockchain combines distributed user nodes (PCs) into a cluster to create an environment that can be used as a supercomputer. This is suitable for efficient allocation of resources such as CPU, MEMORY, and STORAGE and analysis of large amounts of data, so it can exhibit high efficiency when analyzing big data through machine learning and deep learning.

3.1.2 Jupyter Notebook

The Jupyter Notebook is an open source-based web application that provides a development environment for writing and executing code in over 40 programming

languages, including Python. Several codes and execution results written by Python can be managed like a single document, and the execution results of some codes can be checked after loading several types of libraries for data analysis.

The biggest advantage of the Jupyter Notebook is that it can be developed in a web environment, and it can create and share visualizations of data, and it can also modify shared code and collections of data interactive. It combines code, comments, multimedia, visualizations, etc. into an interactive document called a notebook to share, reuse, and rework, and the Jupyter Notebook itself can be hosted on its local system or on a remote server because it is launched through a web browser.

While most of the code sharing methods provided by the cloud service are not interactive, the Jupyter Notebook allows you to check the code directly in a web browser, run it step by step, and check the intermediate result. This means that the code is not fixed, so editing little by little in real time to reflect the feedback provided directly from the browser and running it again is possible, and laptops can also be embedded in users' control units that can be used as a source of code input.

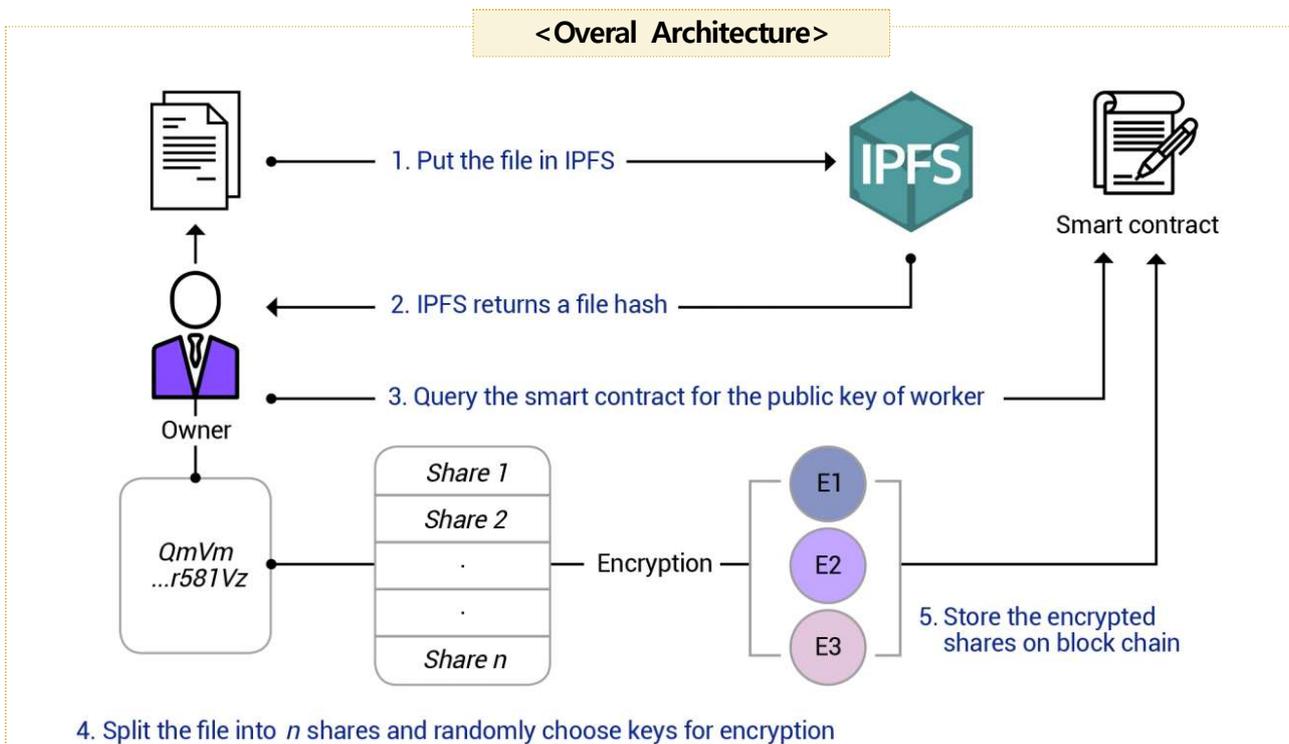
In addition, if there is a code that wants to explain how it works line by line while exchanging real-time feedback, it can be embedded in the Jupyter Notebook, and the code continues to function normally. By providing developers with an environment where they can directly develop, test, and distribute the Jupyter Notebook web access from the outside, there is no need to use a separate programming tool.

3.2 IPFS-based My Public Blockchain

The AICON Blockchain's My the public blockchain is based on IPFS. IPFS is a web protocol for data decentralization and is emerging as a next-generation Internet protocol to solve and supplement the problems of HTTP, the existing server/client method. It is a file system designed with the same file standard and system so

that digital data can be distributed and stored on PCs around the world.

IPFS works by using the hash value converted from the data content to find the content distributed and stored in various computers around the world, fragmenting the data of this content, fetching it at a high speed, and then putting them together and displaying them. Because file fragments are imported from multiple computer nodes at the same time, traditional bandwidth costs can be reduced by more than 60%, data can be saved and retrieved at a much faster speed than the existing HTTP method, and data loss can be prevented because numerous distributed nodes around the world store the information.



The AICON Blockchain provides cloud devices to build its own distributed environment based on IPFS so that user resources such as CPU, GPU, Network, Memory, and Storage can be utilized.

3.3 General Public Blockchain

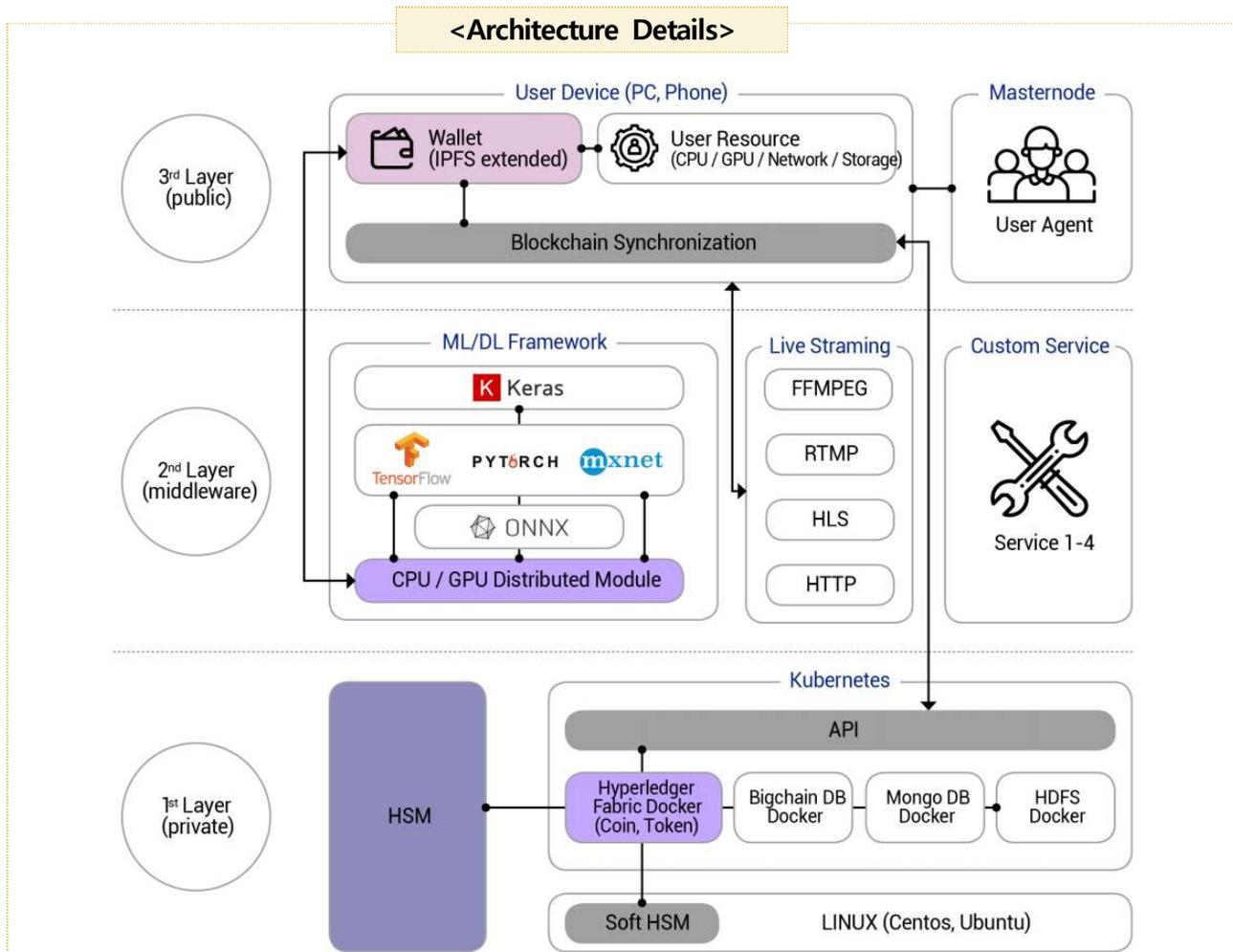
As mentioned earlier, the AICON Blockchain is the hybrid blockchain that

combines the advantages of the private blockchain and the public blockchain and can be linked to other mainnet blockchains such as Bitcoin, Ethereum (quorum), and EOS through the Blockchain API broker in the private blockchain area.

It supports various mainnet coins through communication with the public blockchain platform formed in the public blockchain area. For example, when working with an EOS mainnet that requires high speed, the blockchain API broker in the private blockchain area communicates with the system token of the private blockchain to enable fast data processing. In addition, even in the case of platform business projects that require fast processing, such as payment, transportation, and finance, you can easily conduct platform business simply by connecting to AICON's hybrid blockchain without configuring a separate private chain.

3.4 Architecture Details

The AICON Blockchain consists of a total of three layers: a Kubernetes layer, a middleware layer, and a public layer, as shown in the figure below. The first layer was made to operate in Kubernetes and Docker environments based on the Linux operating system. The Kubernetes platform supports the automation of Container configuration and tasks, which does not require a manual process to deploy, expand, and update containerized applications, enabling uninterrupted service. As this is useful for managing multiple containers, as a result, efficient infrastructure management is possible. If the private area continues to expand, the Linux operating system combined with Kubernetes has a structure that continues to increase.



It plays the role of an independent Container by configuring Docker in the form of an image within Kubernetes. Because there are various versions of Linux, it is difficult to install all the deep learning frames in the private chain area. By configuring Docker, you can reserve Container in a virtual machine cluster and immediately run the desired image. First, through the installed Hyperledger Fabric Docker (Hyperledger Fabric Docker), work related to coins and tokens is performed. Because the internalization process is not easy if the number of data stored in the DB increases depending on the system by sampling and linking coins generated from outside due to security issues, you can use a big chain DB that chains the DB, and run the Hadoop Distributed File System (HDFS) to process large data such as big data in the private DB. HDFS can be used when you do not need a blockchain and want only to process large-capacity big data. In addition, by configuring TrustZone in the Linux operating system and loading a software security

module (SSM), security can be strengthened to prevent external hacking.

3.4.1 ML/DL Framework

Machine Learning/Deep Learning (ML/DL) is composed of Tensorflow, Pytorch, and Mxnet, the world's three major frameworks, and Keras is set at a high level to make library work a little easier for developers. When configuring the AI Framework, allowing developers to perform ML/DL tasks in an easier and more comfortable environment is the core, by configuring independent ML/DL model hubs, it supports various video models, voice models, and text models to allow developers to develop using the ML/DL model and select model even if they don't know the language.

3.4.2 Masternode Method

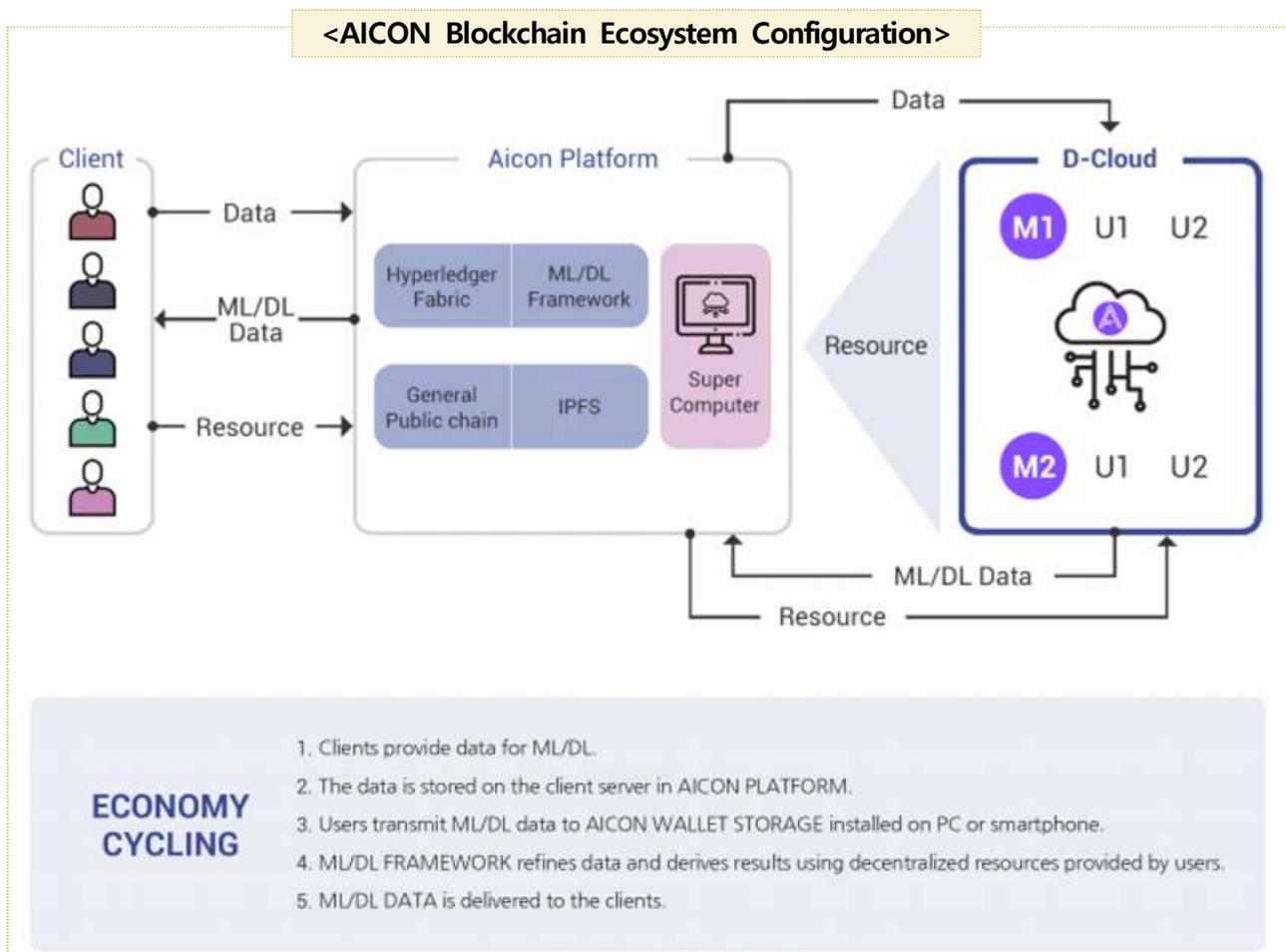
In Horovod, it is important to configure an environment that can always maintain the network according to the amount of data. The AICON Project performs ML/DL in a private environment due to speed and security issues, and the supercomputing environment can be implemented in Horovod only when users participating in the private environment continuously provide a large amount of computing resources.

Users can participate as nodes in the AICON Project with the distributed cloud hardware and software (mining pool) within the AICON Ecosystem and may face a situation in which it becomes difficult to perform ML/DL tasks properly due to constant resource provision and lack of resources. To prevent this, the AICON Project used the master nodes method. If a small number of licensed masters participate as masters nodes in a private environment rather than performing the responsibilities of masters nodes in a traditional public environment, not only can the supercomputing environment be maintained stably, but at the same time, the amount of computing resources provided increases through systematic nodes management.

4. AICON Ecosystem

4.1 AICON Ecosystem Configuration

The entire ecosystem of the AICON Project is largely divided into three categories: the AICON Platform (AICON Platform), Computing Resource Provider, and Client (Data Provider), as shown in the figure below. First, when the client provides data for ML/DL analysis to the AICON Platform, the data is stored on the client server within the AICON Platform, and this data is transmitted to the user's D-Cloud server. The AICON Platform utilizes distributed computing resources provided by users to derive data refinement and results from the ML/DL framework and has a circular structure that finally delivers the results to the client.



4.1.1 AICON Platform

It is a gateway that plays a key role in the AICON Blockchain ecosystem. The

Hyperledger Fabric-based private chain provides the necessary framework and development editor for ML/DL, enabling users to use the distributed computing resources as a single cluster to use it as a supercomputing technology. This combined supercomputing technology makes it possible to analyze big data without using an expensive, high-performance computer. In other words, the AICON Platform plays a role in providing the client with the resources required for ML/DL analysis and a user service platform.

4.1.2 Client (Data Provider)

It refers to a data provider, and as a subject that requires ML/DL analysis and learning, it can be a developer, an ordinary person, or companies (institutions). Data providers provide data to the AICON Platform to obtain the results from the required ML/DL analysis, and the AICON Platform's supercomputing technology provides distributed computing resources to reduce the cost of renting resources for ML/DL. In addition to KRW, you can pay for data analysis using the AICON Token (AICO).

4.1.3 User (Resource Provider)

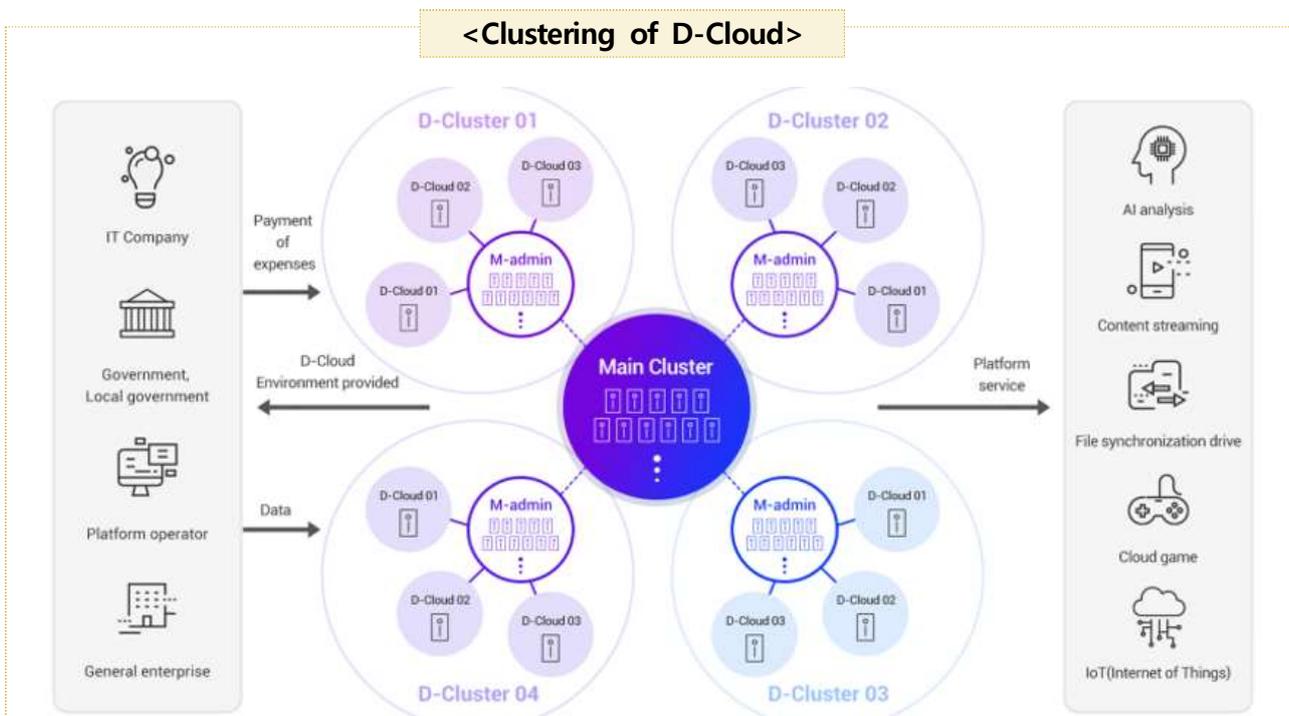
It is the entity that provides computing resources that clients can use in the AICON Ecosystem. It can be an individual or companies, who provides idle computing resources such as CPU, GPU, memory, and storage of the PC to clients through the AICON Platform. Users can receive AICO rewards by providing their computing resources to the AICON Platform.

4.2 AICON D-Cloud

AICON D-Cloud refers to the hardware that composes the distributed network environment within the AICON Ecosystem. It is designed to store, manage, and process large amounts of data in a blockchain-based distributed environment, enhance security, and reduce data processing costs. It not only maximizes performance through system clustering of D-Cloud in the distributed cloud but also compensates for the shortcomings of the existing centralized cloud system. And the

more network participants (nodes) there are, the more data processing cost can be reduced.

Because distributed cloud systems run on a blockchain basis and provide security through compartmentalization, they make the security of the network much more powerful than the current infrastructure provides. Even if an attacker such as a hacker accesses a block with data, it is difficult to penetrate because it is only a part of the file. D-Cloud hardware implements the distributed cloud network environment by providing resources such as CPU, MEMORY, GPU, and STORAGE and consists of hardware (the distributed cloud hardware) and software (mining pool) utilizing idle computing resources of nodes. Data in D-Cloud can be expanded with IPFS-based large-capacity data processing. In addition to distributing file fragments to multiple computers or other hardware, it was implemented to analyze and process data using computing resources. The public chain is based on IPFS, and the private chain is linked to the AI Framework.



D-Cloud hardware began its first supply in September 2020, when the AICON Project began, across the country, established, and is operating its own data

centers. As of February 2020, the data center has about 4,480 CPUs (Core), 25,840GB of memory, 560TB of hard disk, 430,080 GPU (Core)/MEM, 1,680GB and 3PB of storage. These computing resources are used for ML/DL purposes. D-Cloud hardware supplied a total of 5 models, as shown in the figure below.



4.3 AICON Reward

AICON's reward system provides computing resources to D-Cloud users within the ecosystem to increase the performance of the AICON Platform and induce virtuous cycle activities that help clients analyze AI. In particular, D-Cloud users are making more rewards as they provide high-performance computing resources and more computing resources to the AICON Platform. The AICON Blockchain uses the basic trading unit, AICO (symbol name: AICO), and AICO(R) points that are used only within the AICON Ecosystem.

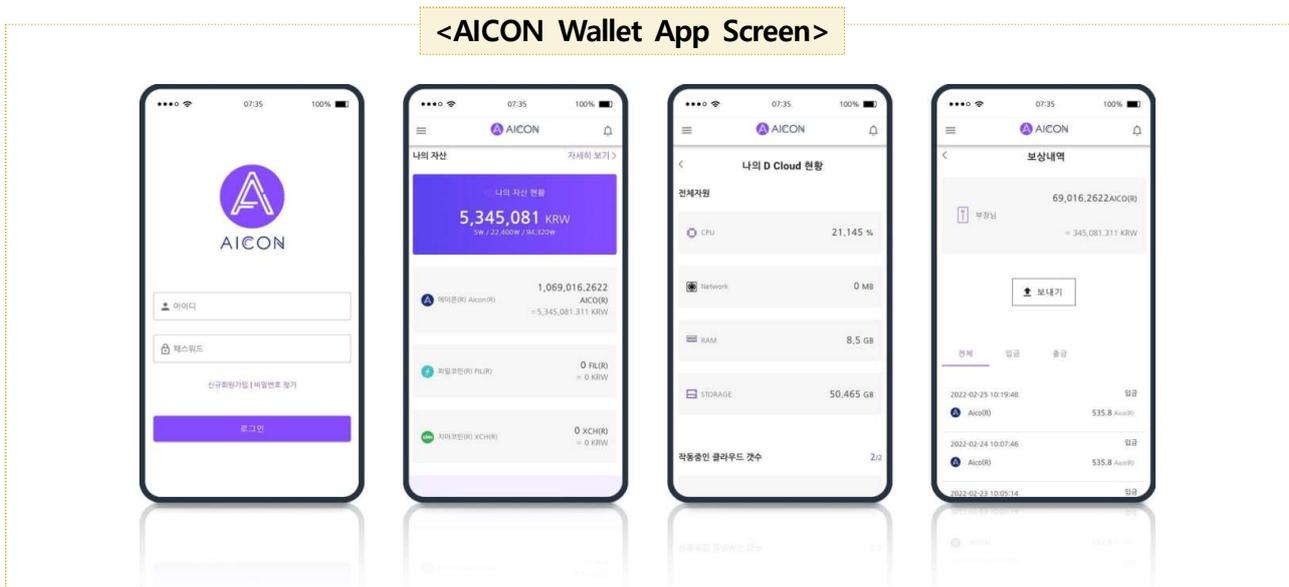
4.3.1 AICON TOKEN (AICO)

AICO is a token made to be tradable on the AICON Blockchain. Currently, you can buy and sell on cryptocurrency exchanges, and you can also transfer money between users. AICO's total issuance is 500,000,000 units. Since AICO follows a protocol implemented with the ERC-20 standard, token investors and users can use the existing Ethereum wallet as it is. It was built so that personal information could not be protected and could not be forged or manipulated using a distributed blockchain network that generates smart contracts.

4.3.2 AICON POINT (AICO(R))

AICO(R) is a point used within the AICON Ecosystem that is not traded separately on the exchange, and is used for the purpose of operation and activation of the AICON Ecosystem. In AICO(R), users who purchase D-Cloud can obtain a certain amount in proportion to the supply price only for a certain period of time. That is, only D-Cloud users who continuously provide computing resources to the AICON Platform may obtain AICO(R).

AICO(R) can be checked by remittance using the wallet app installed on the user's mobile phone provided by the foundation. The history and quantity of D-Cloud purchased by the user in the app, and the computing resources provided by D-Cloud can be checked. In addition, it is possible to check the reward details and total quantity according to the provision of computing resources.



AICO(R) can be converted at a 1:1 ratio with the AICON Token, and can be converted through a conversion application to the foundation within the total number of points held by the user. The conversion application and withdrawal of AICO are made on the date specified according to the foundation policy.

4.4 Participation in International Artificial Intelligence Competition

The AI EXPO KOREA, held annually at COEX in Samseong-dong, Seoul, is a place where you can see, share information, and network everything about AI that will lead to innovation in the era of the 4th industrial revolution, including the latest AI technology, platforms, solutions, applications, AI-based business models, Korean and international AI companies' business strategies, application and deployment strategies. The AICON Foundation participated in the AI Expo 2020 and 2021 to showcase related technologies and platforms.

4.4.1 Participation in 2020 AIExpo

The AICON Project participated in AI EXPO KOREA 2020 to introduce AI-based the distributed cloud hardware models and introduced the hardware distribution status in Korea. The general model AICO-D2 can be used for text-based AI processing and file sharing such as documents and natural language processing, and is also used in the distributed cloud server business. AICO-E1, a company-type model, is a high-end model and is designed to enable AI processing of high-capacity data such as images and videos as well as simple text. It is an optimal model for individuals and companies to use the low-cost and high-efficiency the distributed cloud, and it is made available to real-time streaming service platform operators as well.

4.4.2 Participation in 2021 AI Expo

The AICON Project participated in AI EXPO KOREA 2021 and introduced DCS (D-Cloud Contents Service, hereinafter DCS) v1.0 solution, a service platform that performs AI analysis in the distributed cloud environment. It was a place where 138 companies from eight countries at home and abroad held 187 booths to showcase various AI technology skills. Through DCS' AI analysis solution, we had time to communicate with customers by explaining and demonstrating the overall process of data analysis and IPFS-based file sharing methods.

<2021 AI Expo Photos>

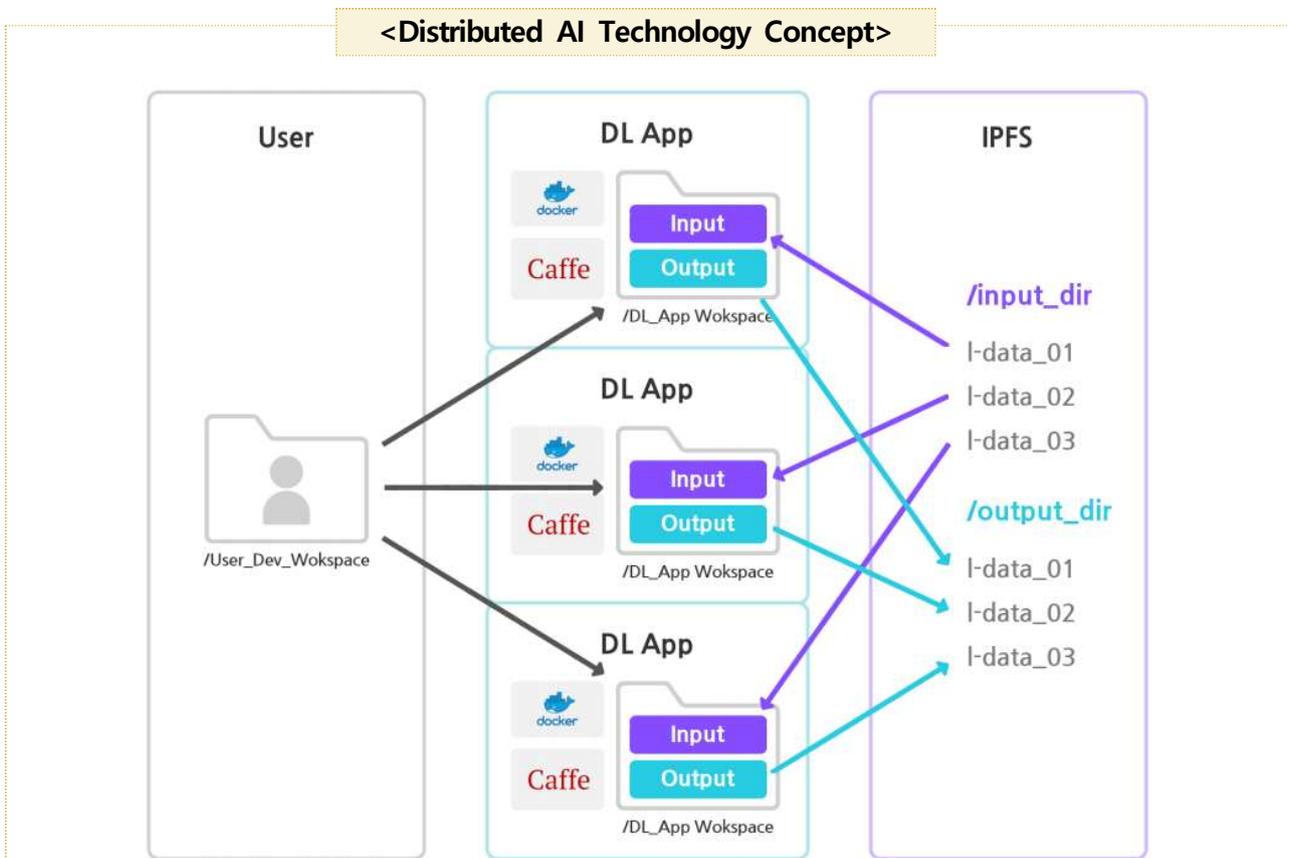


5. Business Model

The core technologies of the 4th Industrial Revolution were fused and combined to reveal a new paradigm and the era of the data economy has arrived. With the cross link of artificial intelligence, the Internet of Things, and big data technologies, all companies around the world are feeling the need for efficient data management and analysis and responding quickly. In particular, global companies are focusing on strengthening their competitiveness through AI analysis, which faces several concerns. When artificial intelligence analysis is performed using a centralized cloud system such as AWS, Google Drive, and MS Azure, problems such as high data processing cost, network congestion, and data loss may occur.

The AICON Project has built a blockchain-based distributed cloud environment to overcome the shortcomings of centralized cloud services, with its business models based on operating in this distributed environment.

5.1 Distributed AI Technology



As shown above, large-scale parallel processing clustering is handled by dividing data into pieces and processing multiple pieces at once on the distributed cloud environment base. In other words, it is possible to analyze large amounts of data at a high speed by establishing an efficient distributed data analysis and ML/DL environment through clustering of several computers. Data analysis is performed by sharing all available resources such as central processing devices, storage space, and data to which multiple the distributed clouds are connected. Useful rules, knowledge expression, or judgment criteria are extracted from the data and learned on their own.

The distributed cloud cluster provides individuals and companies with a distributed cloud environment combined with blockchain to store, manage, and process AI data in a decentralized environment, enhancing security and reducing data processing costs. The AICON Project plans to continuously maximize the performance of a distributed environment through the rapid distribution of hardware and software and clustering of the D-Cloud system, as data processing costs are continuously reduced as the number of blockchain network participants (nodes) increases. AICON's D-Cloud hardware is an extended concept of IPFS, and it is implemented to analyze and process AI data using computing resources rather than sharing file fragments among multiple PCs or hardware.

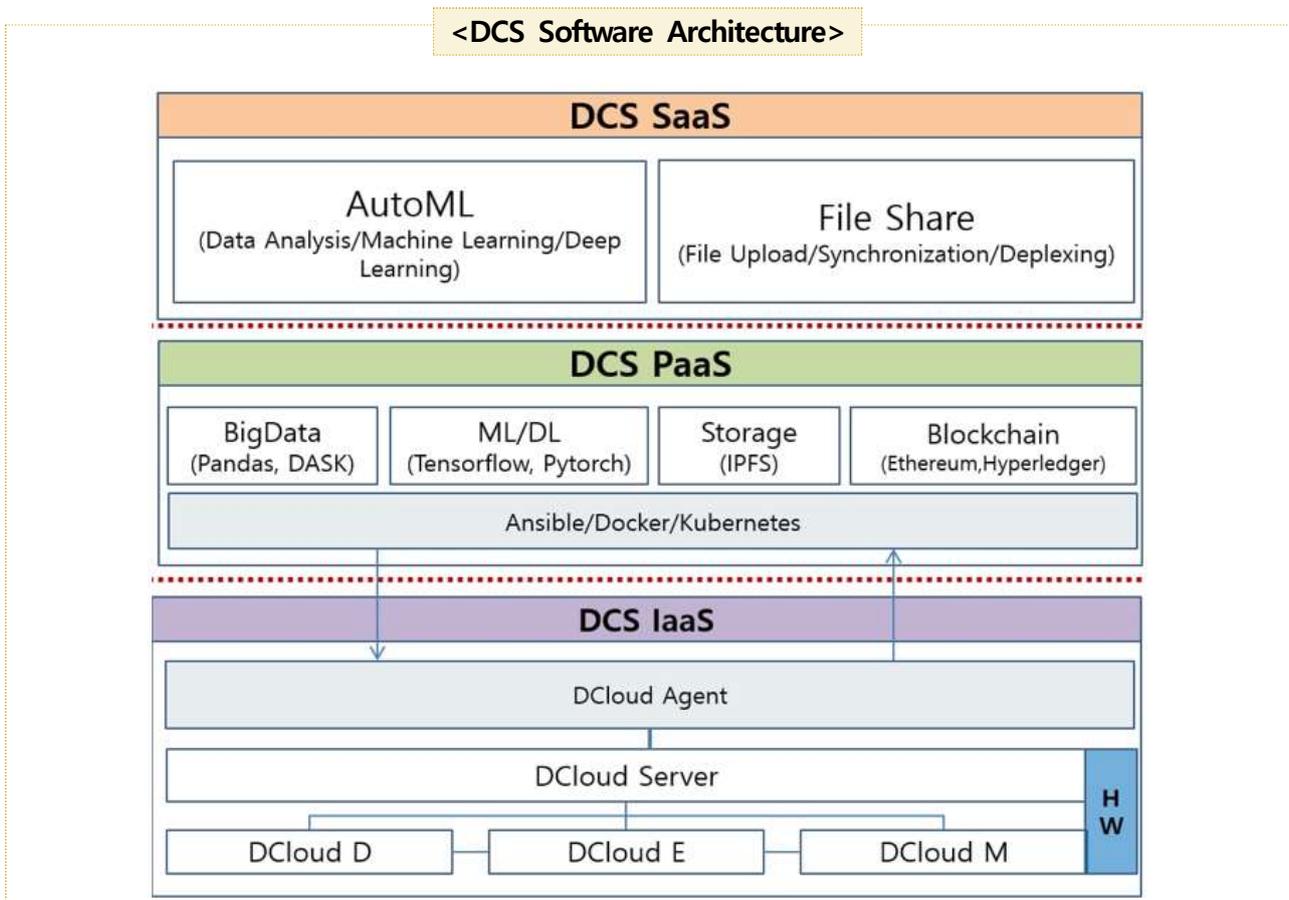
5.2 AI-based Data Automatic Analysis and Development Platform

DCS (D-Cloud Contents Service) is a service platform that supports data analysis and development using the AI technology in the distributed cloud environment mentioned above. DCS uses pre-established computing resources (CPU, GPU, Memory, Storage) of D-Cloud hardware to apply AI to data to derive results in fields requiring high accuracy and predictions based on existing data. It also supports efficient decision-making by comprehensively analyzing the data and using the results as the basis for judgment.

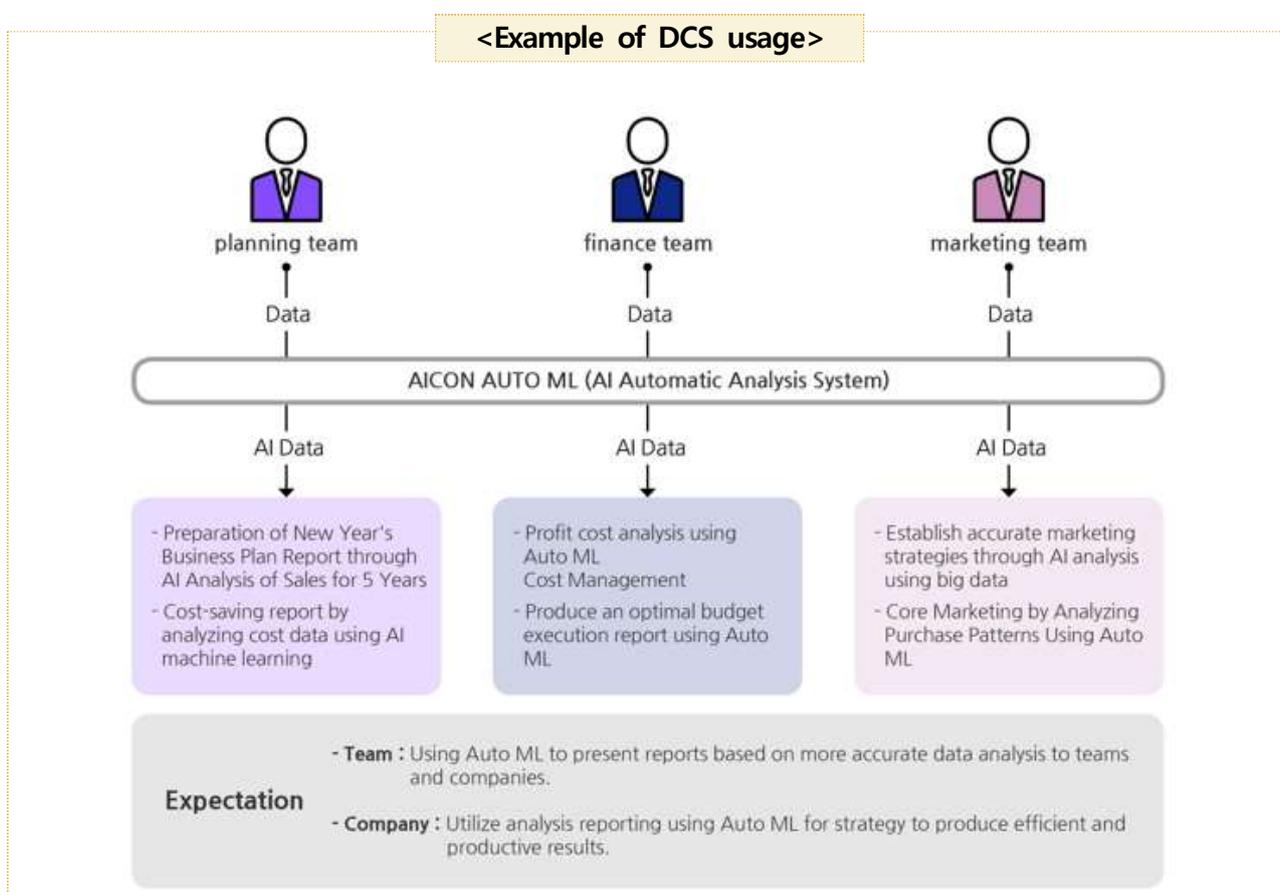
AI-based solutions refer to systems that can predict answers close to answers

rather than systems that provide 100% correct answers. From a business standpoint, the scope of application can be expanded indefinitely depending on what purpose the answer is used for. Regardless of the size of companies such as startups, SMEs, and large companies, the scope of AI services continues to expand, but many companies are having difficulties in adopting AI solutions due to their high cost and difficult usage. DCS supports access to data owned by developers, individuals, and companies (agencies) or externally available data to more easily obtain the desired AI analysis results.

Since Tensorflow, Pytorch, and Mxnet, the world's top three AI Frameworks, are built-in, you can use the development and automated pipeline data analysis service directly in the web environment without installing a separate complex AI framework. Therefore, even ordinary users who are not AI experts can use the service very easily, and the biggest strength is that they can access AI more familiarly.



The platform uses the CSV file format in the form of Excel, which is very familiar to ordinary users, as input data, and displays the figures for the data in graphs and tables so that users can visually check the distribution of data composed of only numbers. In addition, analysis results such as analysis accuracy and running time for each AI analysis algorithm model provided are provided to users. In addition, in connection with the Jupyter Notebook, it incorporates detailed programming and file synchronization that allows developers to easily upload files to users' local drives in IPFS format and share them with other users.



5.3 AI Data Sharing Platform (DePlay)

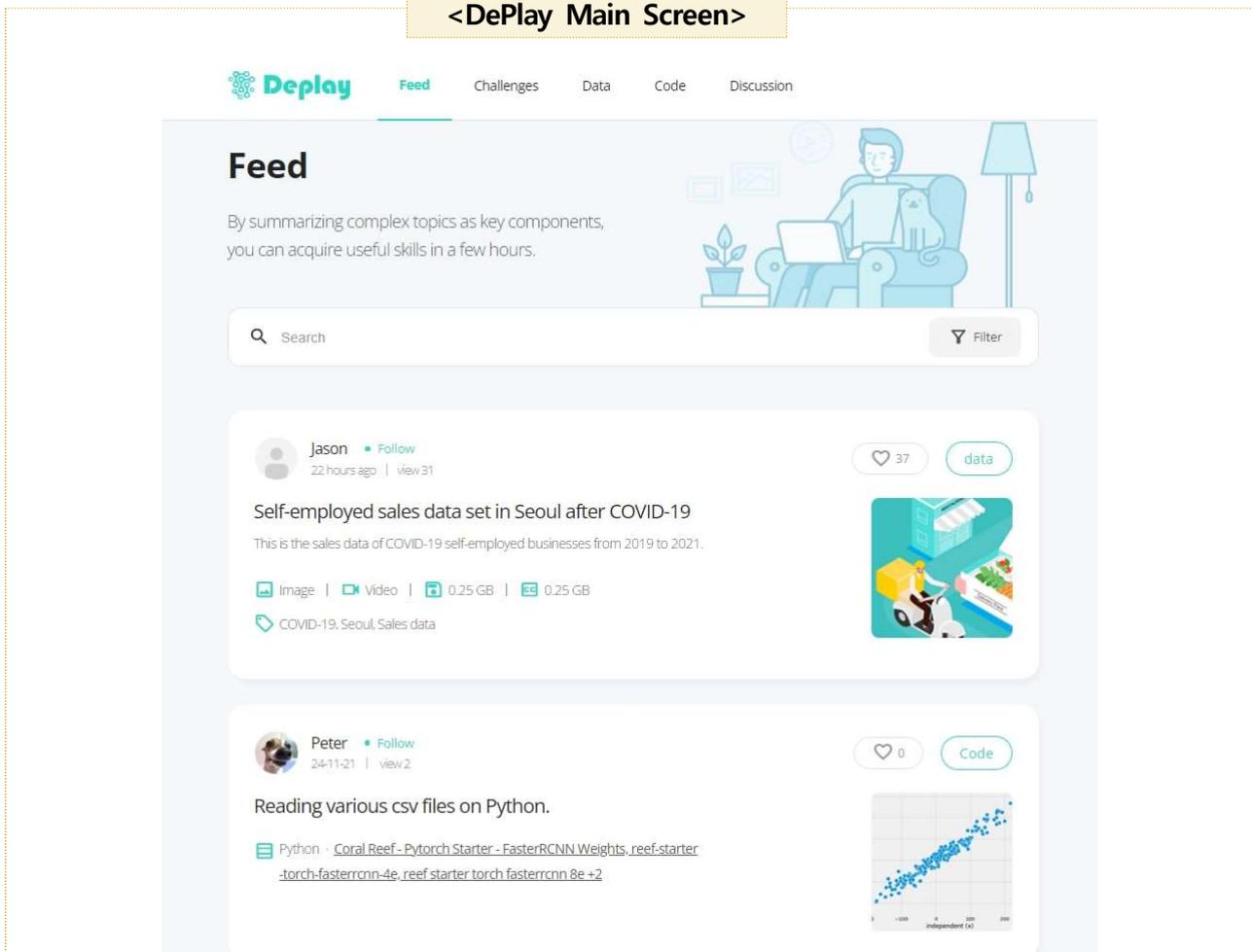
DePlay is a platform that uploads all data required for AI analysis and allows users to share and discuss freely. The goal is to classify the data by category so that users can easily find the data they want, to share and discuss the analyzed results

with each other, to analyze data in connection with the DCS platform, and to increase the utilization of the data.

One of the biggest pharmaceutical companies in the AI field is the lack of data. It is known that many companies have great difficulties in securing usable data. It is no exaggeration to say that the core of AI's competitiveness lies in data. Even if the learning algorithm is excellent, if the amount of data required for learning is not sufficient, it results in poor results. Therefore, the problem of securing data for individuals or companies can be said to be the most important task that leads the project to success. DePlay is a platform to address these problems

The figure below is the main screen of the DePlay platform. The main function is to freely search and share data through the first feed, uploading or finding the data for analysis and freely sharing and discussing the analysis results with other users. You can set the tag function and interest level, so you can recommend the desired data. The second is a contest, where users or companies who want analysis results can upload their data and offer certain rewards. Accordingly, the general user may analyze and compete with the corresponding data to receive a reward. Finally, it is possible to analyze data freely without installing the AI Framework in conjunction with DCS. It also includes general community functions that allow free discussion.

<DePlay Main Screen>

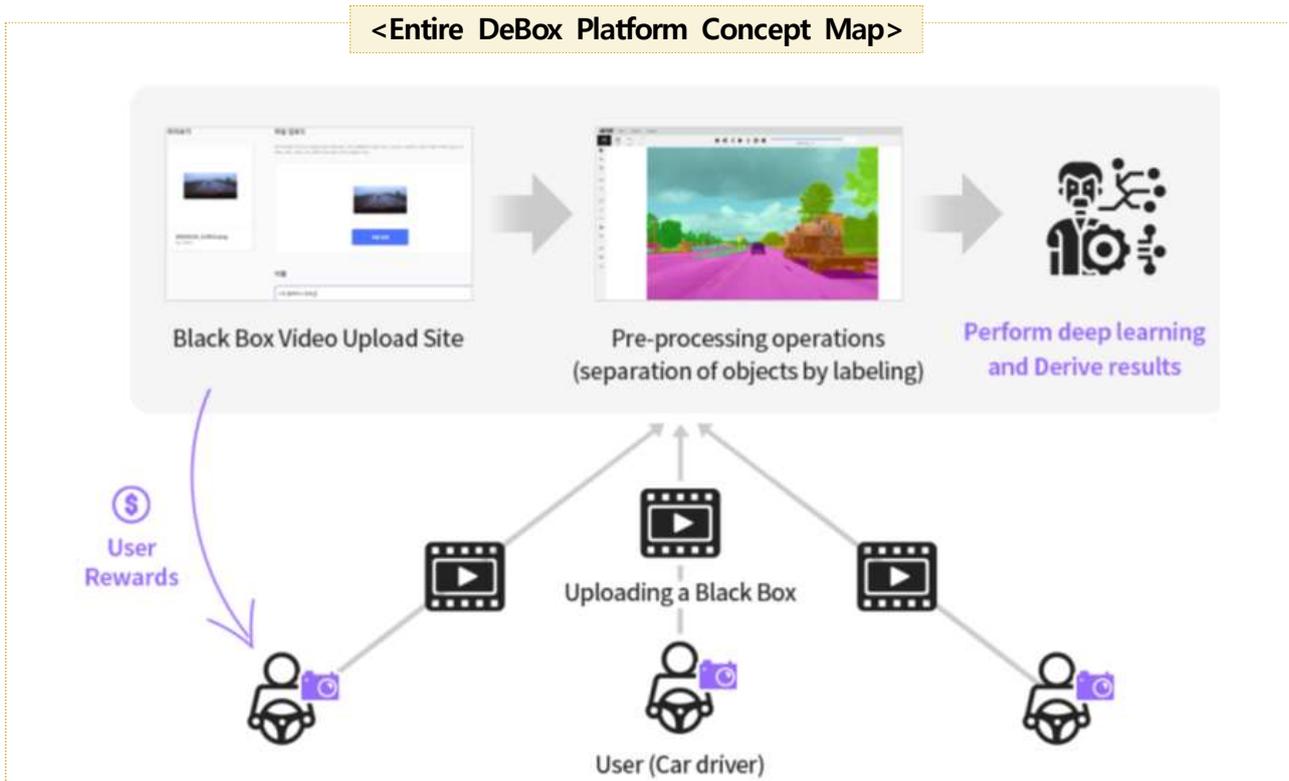


5.4 Black Box Video Platform (DeBox)

It is a platform that builds vehicle video data while rewarding users who collected the images of the vehicle's black box and provided the videos with cryptocurrency and is a service that preprocesses such as labeling of collected objects in the videos and provides analyzed results to customers.

The black box has been reborn as a necessity for all drivers, such as vehicle accident proof, theft and damage prevention. However, most drivers do not pay much attention to the videos recorded in the black box, and most of them are thrown away except when car accidents occur. Therefore, it aims to collect black box images of all driving vehicles that are thrown away through the DeBoxplatform. Users who provide images are rewarded with cryptocurrency, and rewards are differentially paid according to the size of the video files provided by the users.

The videos are stored in the mass storage owned by the Foundation. It can be used in the field of automatic accident and error evaluation of images, in the field of object recognition such as vehicles, traffic lights, people, obstacles, and various objects, and in the prevention of accidents such as slipperiness and animal collisions through object recognition. The figure below is the overall conceptual diagram of DexBox.

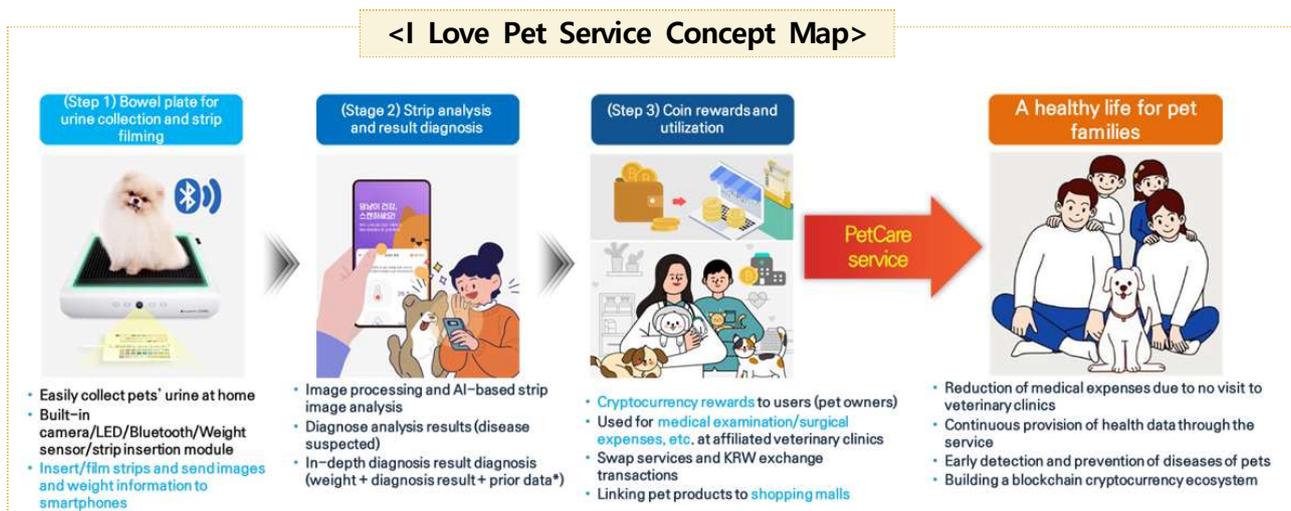


5.5 PetCare Service (I love Pet)

It is a service that allows early detection and prevention of diseases through urine tests on dogs at each home without visiting animal hospitals. The goal is to collect dog urine from bowel plates with a built-in Bluetooth function, take pictures of urine-wet strip with the camera function of an app installed on users' smartphones, and detect dogs' diseases and early through video processing and artificial intelligence-based analysis technology.

The service consists of a bowel plate equipped with a Bluetooth function for dogs to urinate, an app that records the urine-wet strip and reports the analysis result,

and a server at the back that analyzes the strip. The app installed on the user's smartphone is similar to other existing third-party products that take pictures of strips and measure the concentration of 10 types of ingredients (lactose, bilirubin, urobilinogen, ketone, protein, nitrite, glucose, acidity, specific gravity, and white blood cells) contained in urine. However, the MyPetService includes a bowel plate equipped with a Bluetooth function, which includes a weight sensor and Bluetooth Low Energy (BLE) communication function so that the dog can push an alarm to the companion's smartphone when urinating. Therefore, when dogs urinate on the bowel plates, a push alarm is sent to the pet owner's smartphones, so it has the advantage of being able to easily conduct a urine test without checking the dog's urination every time. In addition, all histories such as dog information, test details, and test results are stored on the blockchain to prevent forgery and manipulation of health data and to check and manage the health of dogs with high Veracity.



6. Token Issuance and Distribution

AICO is an ERC-20-based token type of Ethereum that allows remittance between users, and the issuance of tokens aims to create and activate the AICON Ecosystem, and related information is shown in the table below.

Token Name(EN)	Token Name(KR)	Symbol Name	Total Issurance
AICON	에이콘	AICO	500,000,000

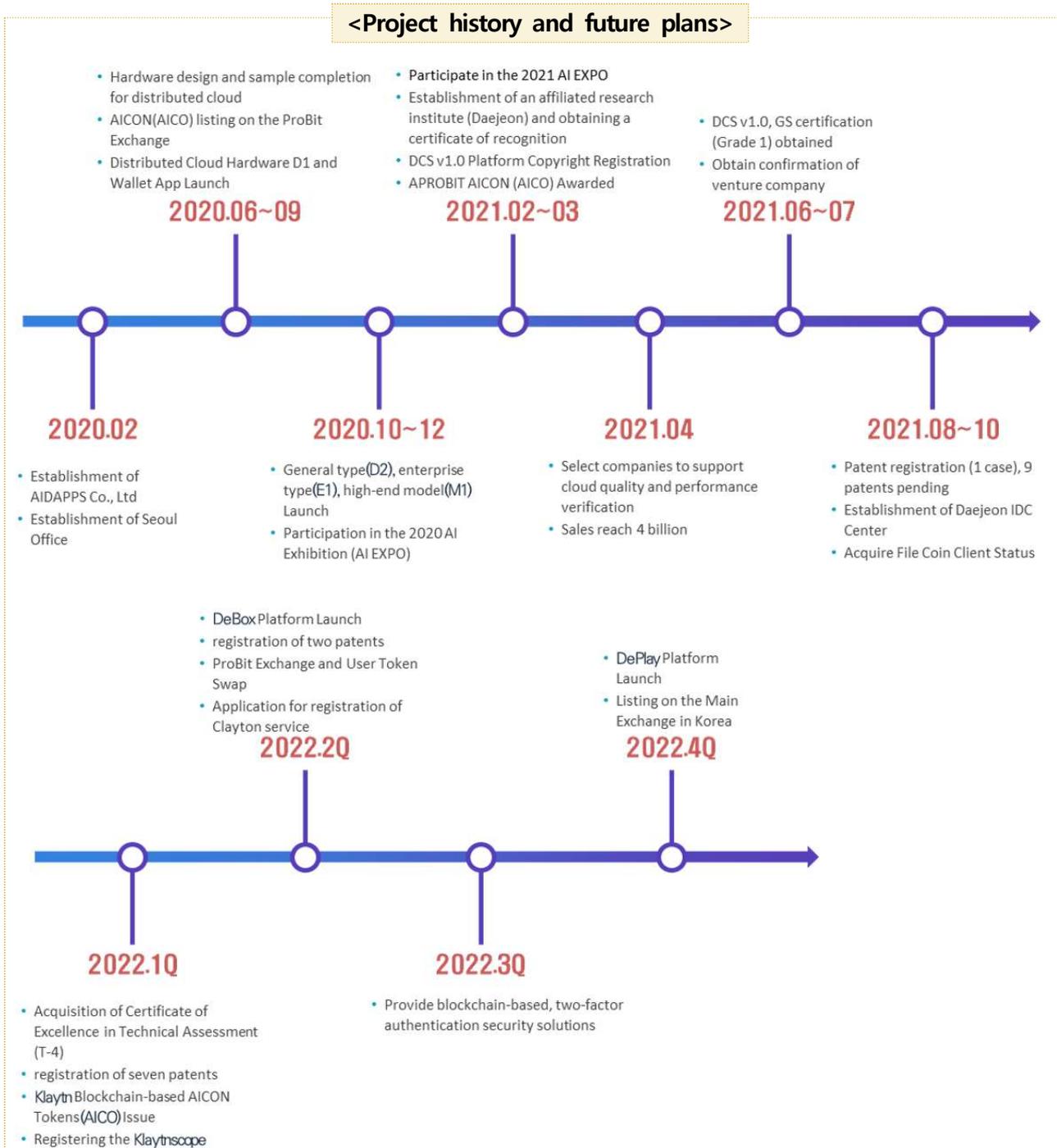
The AICON Project plans to use the user-friendly Klaytn blockchain platform, including the expansion of the wider ecosystem and the use of Klipwallets connected to Kakao Talk. As of February 2022, AICON was registered as an official token in the Klaytn blockchain explorer Klaytn scope. Klaytn's token standard is issued based on KIP-7 and the issuance information is the same as above.

Based on the total token issuance, the distribution ratio is 40% to the AICON Project team (company 20%, advisors 10%, developers 10%), 10% to marketing, 10% to R&D expenses, and 40% to rewards. This distribution ratio may be changed in the future depending on the project team situation and policy.



7. Roadmap

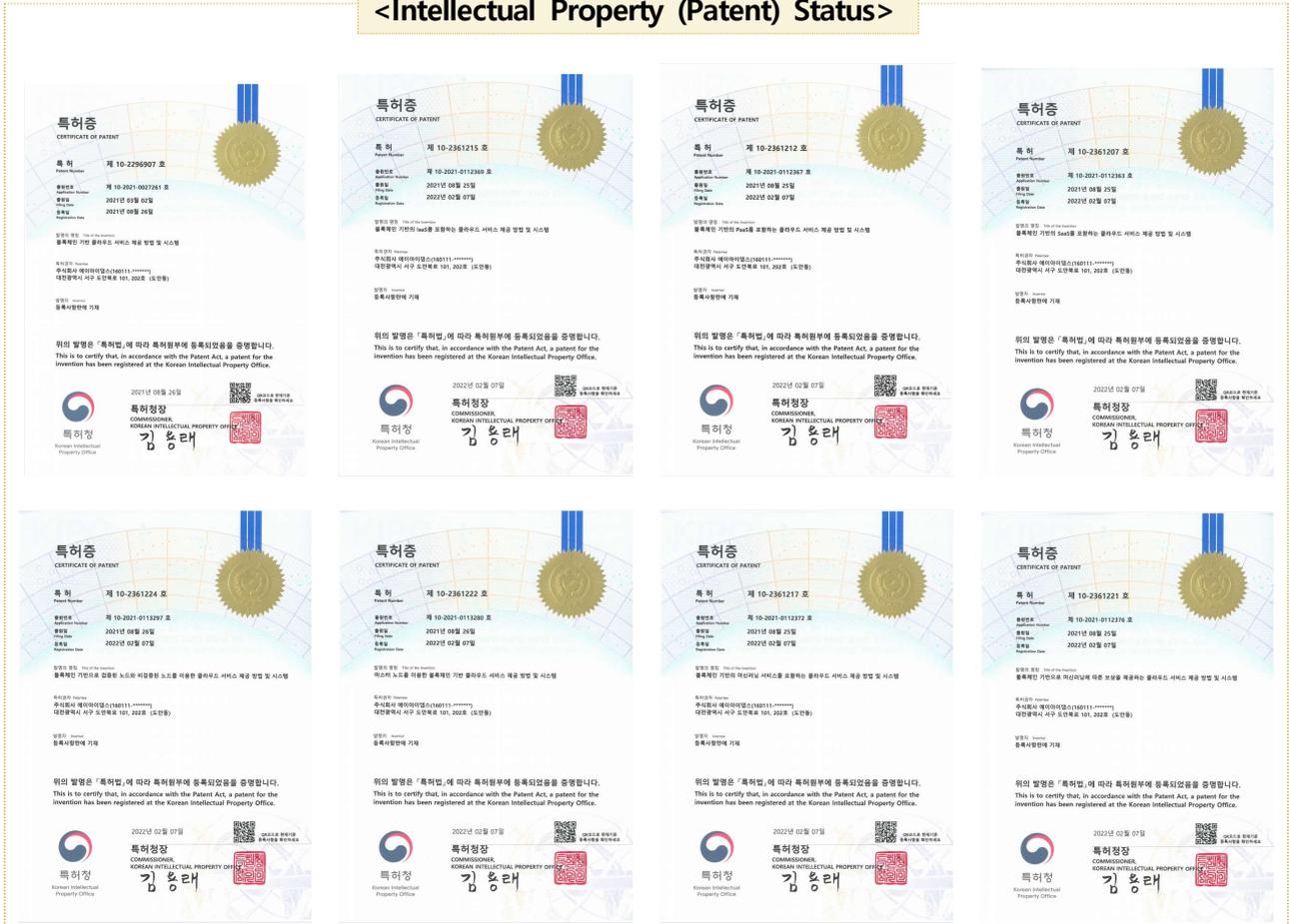
Since its establishment in February 2020, it has built a distributed cloud network by supplying hardware for the cloud, develops various SaaS-type software, listed AICO on the domestic exchange to further expand the eco-system, and pioneers new business possibilities.



8. Intellectual Property and Certification Status

Since the establishment in February 2020, the foundation has made efforts to secure intellectual property rights to enhance competitiveness in the market, and as a result, have registered a total of eight patents as follows, and two additional cases are in the process.

<Intellectual Property (Patent) Status>

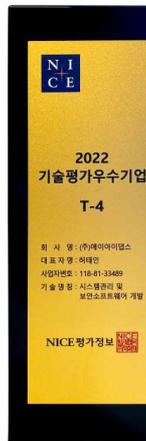


No.	Title of Invention	Registrati on No.
1	Blockchain-based cloud service provision method and system	10-2296907
2	Blockchain-based method and system for providing cloud services including IaaS	10-2361215
3	Blockchain-based method and system for providing cloud services including PaaS	10-2361212
4	Blockchain-based method and system for providing cloud services	10-2361207

No.	Title of Invention	Registration No.
	including SaaS	
5	Blockchain-based cloud service provision method and system using verified and unverified nodes	10-2361224
6	Blockchain-based cloud service provision method and system using master nodes	10-2361222
7	Blockchain-based cloud service provision method and system including machine learning service	10-2361217
8	Blockchain-based method and system for providing a cloud system that provides rewards according to machine learning	10-2361221

It has established a research institute affiliated with the company to foster an organization dedicated to R&D and strives to secure source technology by conducting R&D activities. It also obtained venture company certification as an innovative growth type in recognition of technological innovation and business growth through the review of the venture companies confirmation system and GS certification1 grade for its AI-based automatic data analysis and development platform, DCS v1.0, after a comprehensive test quality test from the Information and Communication Technology Association (TTA).

<Major Certification Status>



No.	Certification type	Remark
1	Software quality certificate	GS certification 1st grade
2	Excellent technical evaluation company certificate	Excellent (T-4)
3	Venture company confirmation	Innovation Growth Type
4	copyright registration certificate	DCS v1.0
5	Certificate of R&D Center affiliated with company	No.2021111352

9. Legal Considerations

1. The purpose of herein whitepaper is to provide information about the AICON Project to potential buyers herein so that they can decide whether to purchase AICO on their own, and herein whitepaper does not constitute the sale, purchase, offer, or request of any of the shares, securities, or assets of the company or related thereto.

2. Herein whitepaper is written for the purpose of providing information about AICON's business purpose and the AICON Project, as well as information on the approach of providing solutions based on blockchain technology, and all information contained in herein whitepaper may be modified or supplemented at any time.

3. The following information may not be comprehensive and does not include any elements of a contractual relationship

4. The operator of the AICON Platform business shall not be liable for any loss of any kind to you in all cases related to herein white paper, including financial or non-financial losses, to the maximum extent permitted by applicable laws, and regulations. This means that the foundation nor the company shall not be liable for any comprehensive loss including loss of sales, income, profits, rights, reputation, or data

5. The AICON Platform and AICO are not considered as collateral within any scope, and the whitepaper herein cannot be provided as an investment book or document in any form, nor can it be used for the purpose of investment in securities, securities, and investor recruitment.

6. AICO purchasers should carefully consider and evaluate all the information in the white paper related to AICO and AICON and all risks and uncertainties related to the legally binding contract before making a purchase. All statements regarding the financial position, business strategy, plans and potential of the foundation are

forward-looking, and neither the foundation nor any persons affiliated with the company or any other person makes any representations about the actual future results, performance and achievements of the Company not be held liable thereto.

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9. Herein whitepaper does not guarantee the integrity of the business promoted by the AICON Project herein. In addition, the foundation nor the company shall be held liable for errors, delays in schedules, and related matters that may occur during service provision and development.

10. Herein whitepaper contains the contents of the future plans and was written based on the realization of the plan. However, this does not guarantee, and the contents of herein whitepaper does not guarantee the integrity of the service to be developed in the future.

11. The content of herein whitepaper cannot be interpreted as legal, financial, accounting, or tax advice in any case, and in the process of purchasing and using AICO, dispositions in accordance to separate laws, finance, accounting, and tax may occur in accordance with policies and laws by each country and region. Buyers and

users may need separate advice, but the foundation nor the company shall be held liable for these matters.

12. The creation of the ecosystem may be delayed or other tangible and intangible losses may occur due to reasons not intended by the AICON Project, such as system attacks from third parties, natural disasters, and force majeure. The foundation nor the company shall be held liable for buyers' risk due to loss or leakage of the buyers' private keys.

13. AICO is not free from all risks, including decline in the value of AICO, changes in the market environment, uncertainty, political risks, and competition with competitors, which may result in the suspension of the development of the AICON Project or changes in service direction and future plans.

14. The foundation or the company shall not delegate or transfer all decisions, including the operation policy of the ecosystem and the suspension of operation, to others, and all decisions shall be made at the discretion of the foundation.

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