



# MEPIUS

## WhitePaper

A Blockchain-based Blood-free measuring device

Ver 1.0.3

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# MEPIUS

MEPIUS is a compound word of Metaverse and Aesculapius, the god of healing and medicine in Greek mythology which means that a new world of medical environment will be created and developed. MEPIUS team has developed a technology that conduct tests for various diseases and symptoms without using blood samples ranging from diagnosing diabetes, cancers, AIDS and illegal drug use to measuring one's alcohol level for our healthier lives.

OPHION Public Device for blood-free measurement is installed in the environment setting for organizations, groups and general users so that they may discover diverse disease in early stages. Users who need frequent blood testing may use OPHION Personal Device so that health data can be sent with ease and promptness. With our devices, patients suffering from chronic diseases may relieve discomfort. In addition to this, the devices quickly measure illegal drug use, alcohol level in blood and AIDS to identify social problems in advance.

Healthcare information measured with OPHION is stored in MEPIUS blockchain environment when users agree to record their information and if necessary, the organizations and nations may read the information. All recorded data are controlled separated from the personally identifiable information (e-mail, name, contact information, etc.) and they are encrypted and distributed based on the blockchain characteristics preventing any information leakage. The organizations and countries that use data recorded in MEPIUS will distribute profits to users who provided such information.

The ultimate goal of MEPIUS team is to encourage medical development with personal health information kept and controlled safely and to build an advanced healthcare environment applicable to real lives. A range of research institutes and medical centers will initiate their projects in MEPIUS blockchain environment and they will share the revenue from the research result with the project participants. MEPIUS team will continue to conduct researches on OPHION, a blood-free measuring device and MEIPUS blockchain technology from diverse and broad perspectives for the benefit of humankind.

## 02 Background

### 2-1 Diabetes Management Market

OPHION for blood sugar measurement is closely related to digital platform supply and expansion owing to the increased incidence of diabetes, technological development and diabetes management. When MEPIUS and OPHION are supplied to the global market, it will increase the market's glucometer supply rate of developing and underdeveloped countries. Cryptocurrency may be used for payment to overcome the volatility of exchange rates in those countries and tackle the unstable payment issue.

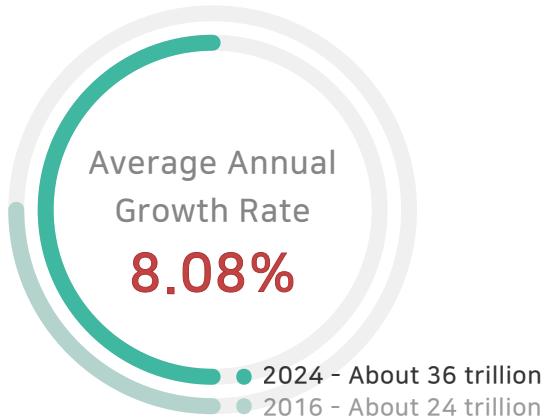
#### Global Market Scale



#### Global Digital Diabetes Market Management

2019 - Increase in average annual growth rate 23.8% from USD 6.88 billion (about KRW 8.21 trillion) to  
2024 - USD 19.99 billion (about KRW 23.86 trillion) is expected.

• Source : MarketsandMarkets, Digital Diabetes Management Market, 2019



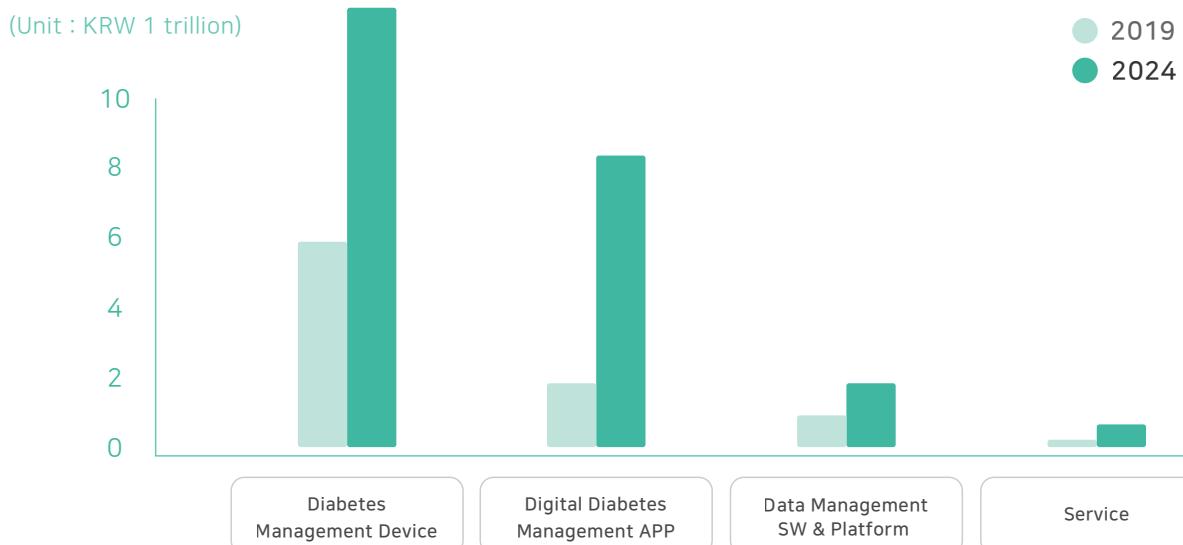
#### Global Digital Diabetes Management Device Market

2016 - Increase in average annual growth rate (8.08%) from USD 20.8 billion (about KRW 24 trillion) to  
2024 - USD 30.68 (about KRW 36 trillion) is expected.

• Source : Techavio, Global Diabetes Management Devices Market, 2017

## 02 Background

### Digital Diabetes Management Market Scale by Detailed Item



• Source : MarketsandMarkets, Digital Diabetes Management Market, 2019

#### Diabetes Management Device

2019 - Increase in **average annual growth rate 20.9%** from USD 4.63 billion (about KRW 5.4 trillion) to 2024 - USD 11.94 billion (about KRW 14.3 trillion) is expected.

#### Digital Diabetes Management App

2019 - Increase in **average annual growth rate 36.3%** from USD 1.39 billion (about KRW 1.6 trillion) to 2024 - USD 6.53 billion (about KRW 7.8 trillion) is expected.

#### Data Management SW & Platform

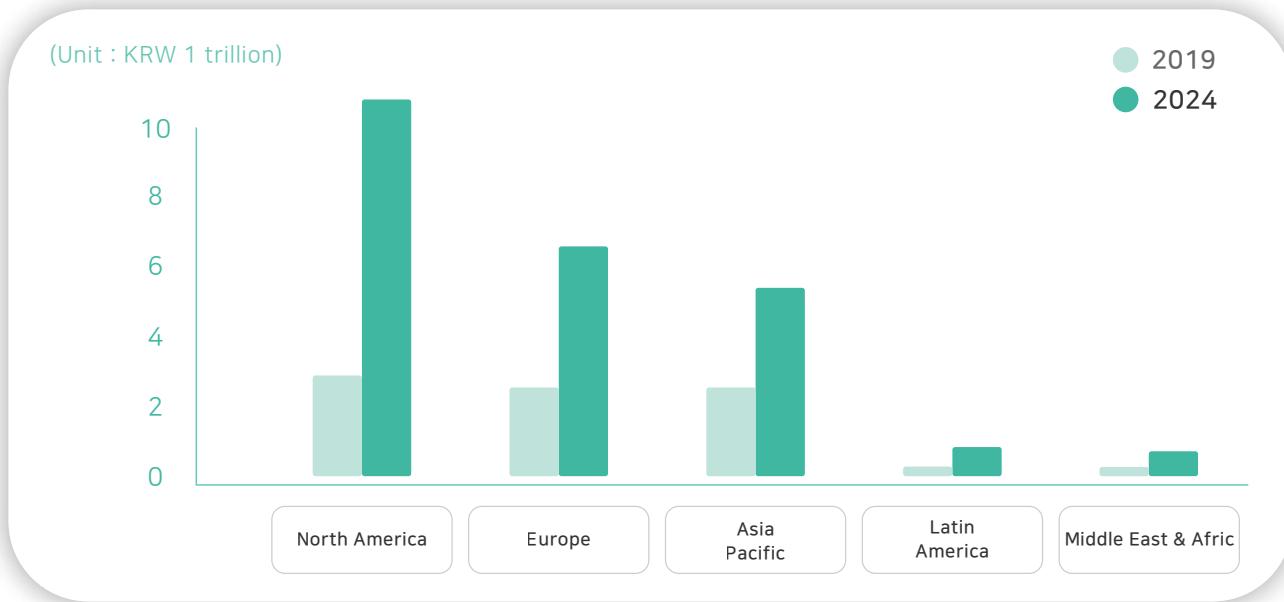
2019 - Increase in **average annual growth rate 10.3%** from USD 0.69 billion (about KRW 0.8 trillion) to 2024 - USD 1.12 billion (about KRW 1.3 trillion) is expected.

#### Diabetes Related Service

2019년 - Increase in **average annual growth rate 18.6%** from USD 0.17 billion (about KRW 0.2 trillion) to 2024년 - USD 0.4 billion (about KRW 0.5 trillion) is expected.

## 02 Background

### Market Scale of the Developing / Underdeveloped Countries



• Source : MarketsandMarkets, Digital Diabetes Management Market, 2019

#### North America

Increase in **average annual growth rate 26.7%** from USD 2.84 billion (about KRW 3.3 trillion) in 2019 to USD 9.25 billion (about KRW 11 trillion) in 2024 is expected.

#### Europe

Increase in **average annual growth rate 22.9%** from USD 2 billion (about KRW 2.4 trillion) in 2019 to USD 5.6 billion (about KRW 6.6 trillion) in 2024 is expected.

#### Asia Pacific

Increase in **average annual growth rate 21.3%** from USD 1.68 billion (about KRW 2.2 trillion) in 2019 to USD 4.23 billion (about KRW 5.5 trillion) in 2024 is expected.

#### Latin America

Increase in **average annual growth rate 17.7%** from USD 0.25 billion (about KRW 0.3 trillion) in 2019 to USD 0.55 billion (about KRW 0.66 trillion) in 2024 is expected.

#### Middle East & Africa

Increase in **average annual growth rate 12.9%** from USD 0.2 billion (about KRW 0.2 trillion) in 2019 to USD 0.36 billion (about KRW 0.43 trillion) in 2024 is expected.

## 02 Background

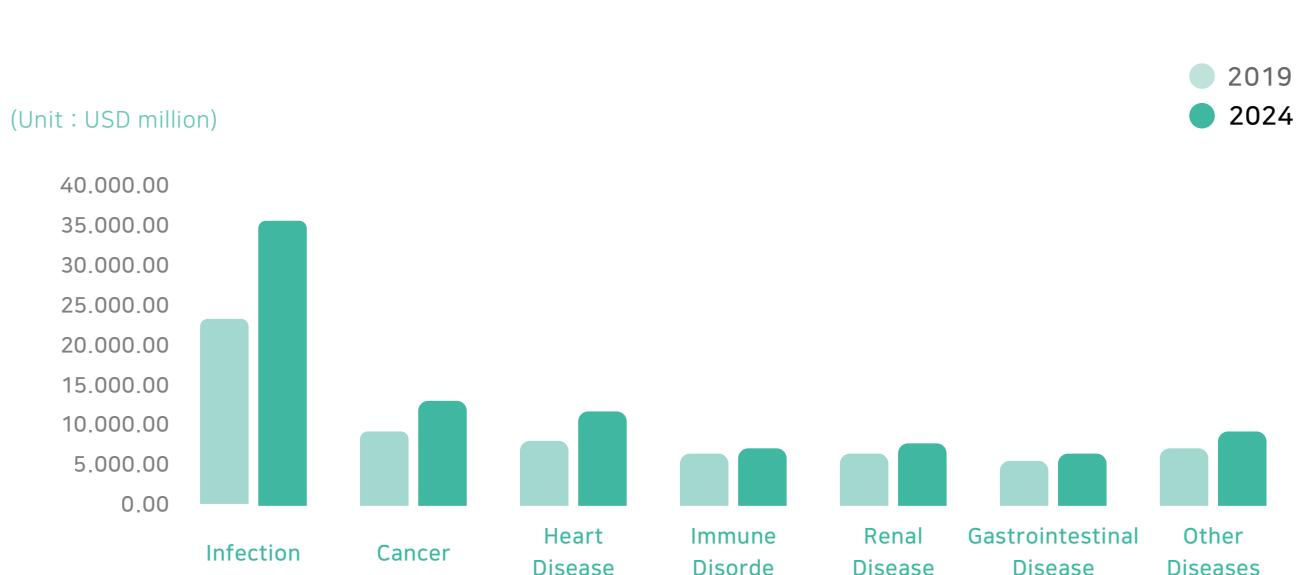
### 2-2 Health Industry Market & Medical Waste Disposal Market

OPHION performs blood-free testing which reduces the cost for medical examinations. Blood-free measuring devices do not generate medical wastes, which in turn saves expenses for waste treatment and prevent environmental pollution as well as lower the risk of infection that may occur in the waste disposal process. Thus, it is interconnected with the entire process of medical exam market and changes to the medical waste disposal approaches.

#### ● Growth of the Global Market for Medical Expenses

It is anticipated that the global market of healthcare industries will reach approximately USD 14 trillion (about KRW 16,000 trillion) in 2023. According to the Global Data research result, the global market of medical devices for diagnosis was USD 73.5 billion (about KRW 85.5 trillion) in 2019 and the market size of medical examinations in China was CNY 300 billion (about KRW 55 trillion) in 2020.

[Global In-Vitro Diagnosis Market Scale]



• Source : Allied Market Research, Global In-Vitro Diagnostics Market, 2021

## 02 Background

### Inflection

Increase in average annual growth rate 6.3% from USD 23.6 billion in 2019 (about KRW 27.6 trillion) in 2019 to USD 25.9 billion (about KRW 42 trillion) in 2027 is expected.

### Cancer

Increase in average annual growth rate 5.6% from USD 9.3 billion (about KRW 10.9 trillion) in 2019 to USD 13.4 billion (about KRW 15.6 trillion) in 2027 is expected.

### Heart Disease

Increase in average annual growth rate 4.4% from USD 8.8 billion (about KRW 10.3 trillion) in 2019 to USD 11.6 billion (about KRW 13.5 trillion) in 2027 is expected.

### Immune Disorder

Increase in average annual growth rate 2.0% from USD 6.4 billion (about KRW 7.4 trillion) in 2019 to USD 6.9 billion (about 8.1 trillion) in 2027 is expected.

### Renal Disease

Increase in average annual growth rate 3.4% from USD 6.2 billion (about KRW 7.2 trillion) in 2019 to USD 7.6 billion (about 8.8 trillion) in 2027 is expected.

### Gastrointestinal Disease

Increase in average annual growth rate 3.0% from USD 5.6 billion (about KRW 6.4 trillion) in 2019 to USD 6.7 billion (about KRW 7.7 trillion) in 2027 is expected.

## 02 Background



### ● Medical Waste Disposal Market Scale

According to a market analysis center, Fact. MR, it has been identified that the global medical waste disposal market size reached approximately EUR 14 billion (about KRW 18.8 trillion) in the previous year. It is expected that the market will grow to EUR 19.5 billion (about KRW 26.2 trillion) by the end of 2025. The growth has been stagnant showing a moderate growth about 5.1% Meanwhile, countries around the world are demonstrating a great interest on social phenomenon related to environmental pollutions and are in trouble finding solutions to dispose medical wastes that are difficulty to be discarded and banned for use. Furthermore, we are observing a drastic increase in medical wastes and disposables owing to the outbreak of COVID-19 pandemic in 2019.

# 02 Background

## 2-3 Remote Medical Treatment Market

OPHION Personal Device offers diverse blood analysis functions, which is highly portable and accessible. When a portable, personal blood-free measuring device is adopted in the rapidly-growing remote medical treatment market, online medical diagnoses will get more accurate. Portability of OPHION and data security function of MEPIUS are closely related to the digital healthcare market, chronic disease patient management market and medical supply market of developing countries.

### ● The Market Size of Digital Healthcare Industry & Chronic Disease Patients in China

According to a market research agency, Statista, the global market size of digital healthcare industries is expected to increase from USD 106 billion (about KRW 126.5 trillion) in 2019 to USD 739 billion (about KRW 853.6 trillion) in 2026, showing an average annual growth rate of 29.3%. The rate of patients suffering from chronic diseases in China is about 22% of the total population as of 2018. Assuming that the rate maintains, it is expected that the rate of chronic disease patients receiving remote medical treatment will increase from 0.4% in 2018 to 4% in 2020 and 15% by 2025.

In conclusion, the market size of remote medical treatment in China estimated based on the rate of chronic disease patients receiving remote medical treatment will continue to grow from CNY 91.5 billion (about KRW 17.7 trillion) in 2020 to about CNY 517.3 billion (about KRW 96.5 trillion) in 2025, demonstrating an average annual growth of about 50% for the next 5 years.

### ● Unfair Access to Medical Treatment in Developing or Underdeveloped Countries

It is estimated that the world's population will reach 9.3 billion by 2050 and the population of developing countries will account for 85% (8.2 billion) of the world's population. Medical centers and hospitals are concentrated in major cities of developing countries, making it difficult for people living in suburbs to receive medical services. A remote medical treatment system and online consultation will be a practical solution for patients regardless of where they live. Also, it is expected that patients with mobility difficulties as well as the general public may receive such medical services. Global companies are constantly developing the remote medical treatment market to offer advanced medical services to expatriates in developing countries.

# 02 Background

## ● Global On-Demand Healthcare Market

On-Demand healthcare market is an extended concept of the existing remote medical treatment based on video consultation, which includes user-customized services like drug distribution and insurance along with medical treatment and prescription. Companies are eager to enter the on-demand healthcare market considering marketability and scale.

### 1) Global Big-Tech Companies

Companies like Amazon, Google and Microsoft invested USD 3.1 billion (about KRW 3.6 trillion) in the first half of 2021 for healthcare, expanding their business scale to the healthcare market.

### 2) Representative Healthcare Companies in America

Enterprises such as Teladoc, Alto Pharmacy, Ro and Amwell have invested USD 2.7 billion in total in the previous year.

### 3) Representative Healthcare Companies in China

Large companies specializing in remote medical treatment platforms like WeDoctor, PingAn Good Doctor, Ding Xiang Yuan in China utilize AI and cloud technologies to connect doctors with patients and offer services like online medical appointment, healthcare advices and prescription delivery.

### 4) French Government

Digital medical development has accelerated since the outbreak of COVID-19 pandemic and the French government announced its plan 'to invest the budget for digital medical development in 2020 (EUR 2 billion (about KRW 2.66 trillion). It is predicted that health-tech in France will make revenue of about EUR 40 billion (about KRW 532.1 trillion) by 2030.'

## 02 Background

### 2-4 Strengths of Blockchain Data Security

Issuing health diagnosis information in blockchain is to enhance data security.

Here are several pros of blockchain data security.



#### Distribution (Decentralization)

Blockchain does not store data in one server, but distributes data into several network nodes and saves them. When data are exclusively stored in a centralized data management system, they may be easily lost and/or forged. Also, an additional cost for server capacity expansion may be required as data processing is centralized in a server. However, a blockchain structure allows data distribution to handle data loss and forgery and data processing nodes that participate in network will make a certain amount of profit, in other words covering expenses for data processing.

#### Expandability

Blockchain is developed with open source so anyone can be network participants by building nodes. Several people may take part in building nodes because network expansion is flexible and more nodes mean less burden for network operation and maintenance.

#### Transparency

Basically, transactions recorded in blockchain are disclosed. Data are distributed and saved in network to facilitate user accessibility. Since the distributed and saved data continue to verify and retain that they have same information, any malicious data forgery may be prevented. A series of data stored in blockchain are open to all network participants to ensure transparency and traceability.

#### Invariability

Transactions in blockchain can be verified quickly and blockchain nodes do not accept invalid transactions. It is impossible to delete or restore the recorded transactions.

# 03 Mepius Introduce

## 3-1 Why MEPIUS (MEPS) Coin?

Blockchain is a technology that distributes, records and controls block through P2P network without a central organization. The MEPIUS team applies the blockchain structure to manage personally identifiable information and health information with on/off-chain and produces statistical data that may be helpful in developing medical science technologies around the world to develop MEPIUS that is capable of building a blockchain environment where data forgery is impossible.

The MEPIUS team has a blockchain technology that can check one's health condition and store /send health data using OPHION, a bloodless diagnosis device. MEPIUS may be expanded to the field of big data that ultimately manages personal health information and produces statistics, and the accumulated data may be sent to a range of fields with the user's consent. When health information is sent, information providers and companies will create revenue and can check where the information is used and accurate profit distribution.

MEPIUS is mainly applicable to individuals, medical/research institutes and national health departments in different countries. They will receive personal health information as well as information on blood analysis and symptoms and disclosed information may vary according to the MEPIUS users. MEPIUS users may adopt the technology to produce medical statistics, apply it in clinical trials or use it as reference in papers and books. It may also encourage medical science development to develop remote medical treatment and AI medical diagnosis systems.

The key economic structure of MEPIUS is that users are rewarded with MEPIUS coins when their health data are saved onto on-chain and when others or other organizations request to read the user information, coins will be used. With a virtuous economic cycle, the blockchain technology facilitates accessibility and offers value of health and information.

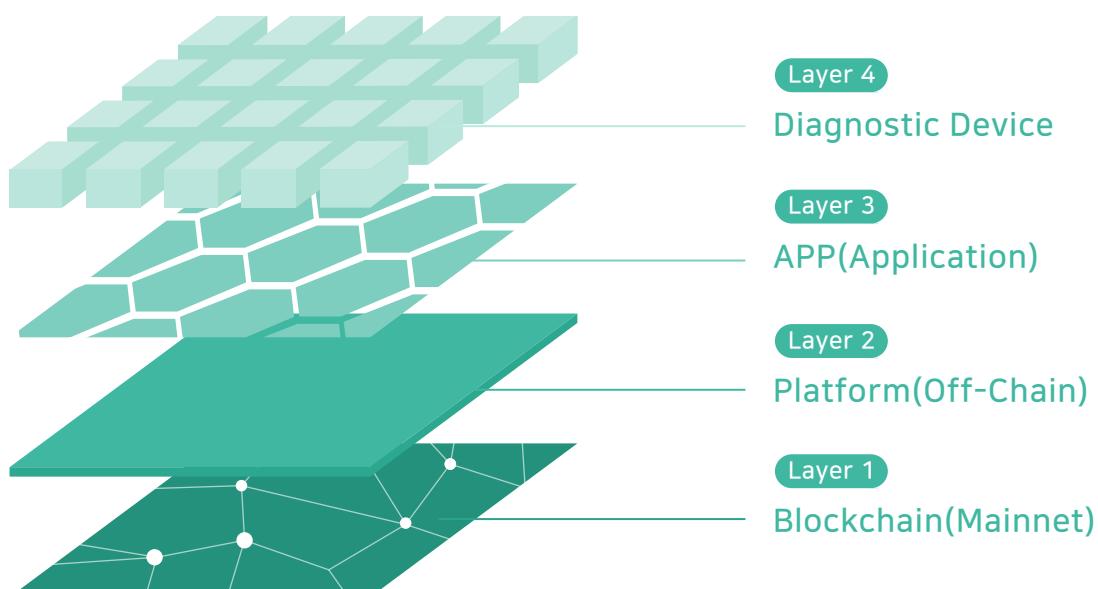
Thus, MEPIUS will establish a transparent economic system by applying blockchain to estimate national health statistics and improve national/corporate health.

# 03 Mepius Introduce

## 3-2 Overview of MEPIUS Technology

MEPIUS is a platform that manages health information measured in a diagnostic device and offers a way for organizations to use such information after receiving the data owner's approval through Smart Contract. For MEPIUS application, a platform that operates in off-chain outside blockchain is needed. Additionally, HRC that supports HApp (Health Application) to assist Smart Contract that the organization publishes and HIPs that define HRC production may be proposed for use. Organizations or users who wish to use blockchain may obtain access to health information through authentication and receive API support to implement the off-chain platform. MEPIUS will be built as a platform that offers a blockchain operating environment to implement the on-chain and off-chain platforms. Individual operators have the following functions for MEPIUS operation.

### ● MEPIUS Service Structure



# 03 Mepius Introduce

## 1) Blockchain(Mainnet)

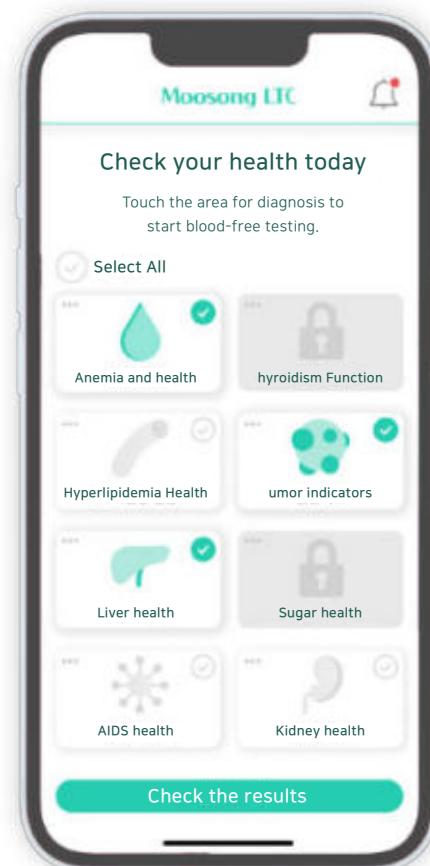
Mainnet publishes and records personal health information and verifies the information with participating nodes through PoW (Proof-of-Work). It continues verification to prevent data forgery and supports record archiving. Also, data that users recorded are added and provided to organization which need such data. Organizations may use a Smart Contract in Mainnet to obtain approvals on using personal health information. For organizations to read user data, they should request for approval in Mainnet, publish a Smart Contract that defines rewards offered to information providers and build an off-chain platform.

## 2) Platform(Off-Chain)

Off-Chain Platform is a platform for health information management interconnected with blockchain. This platform is to manage and offer health information and related personal information, which has a membership registration and member information management and provision functions. The platform interconnects with blockchain to search for the wallet address and Smart Contract so that user approval status and service participation can be checked and on-chain data are offered.

## 3) APP(Application)

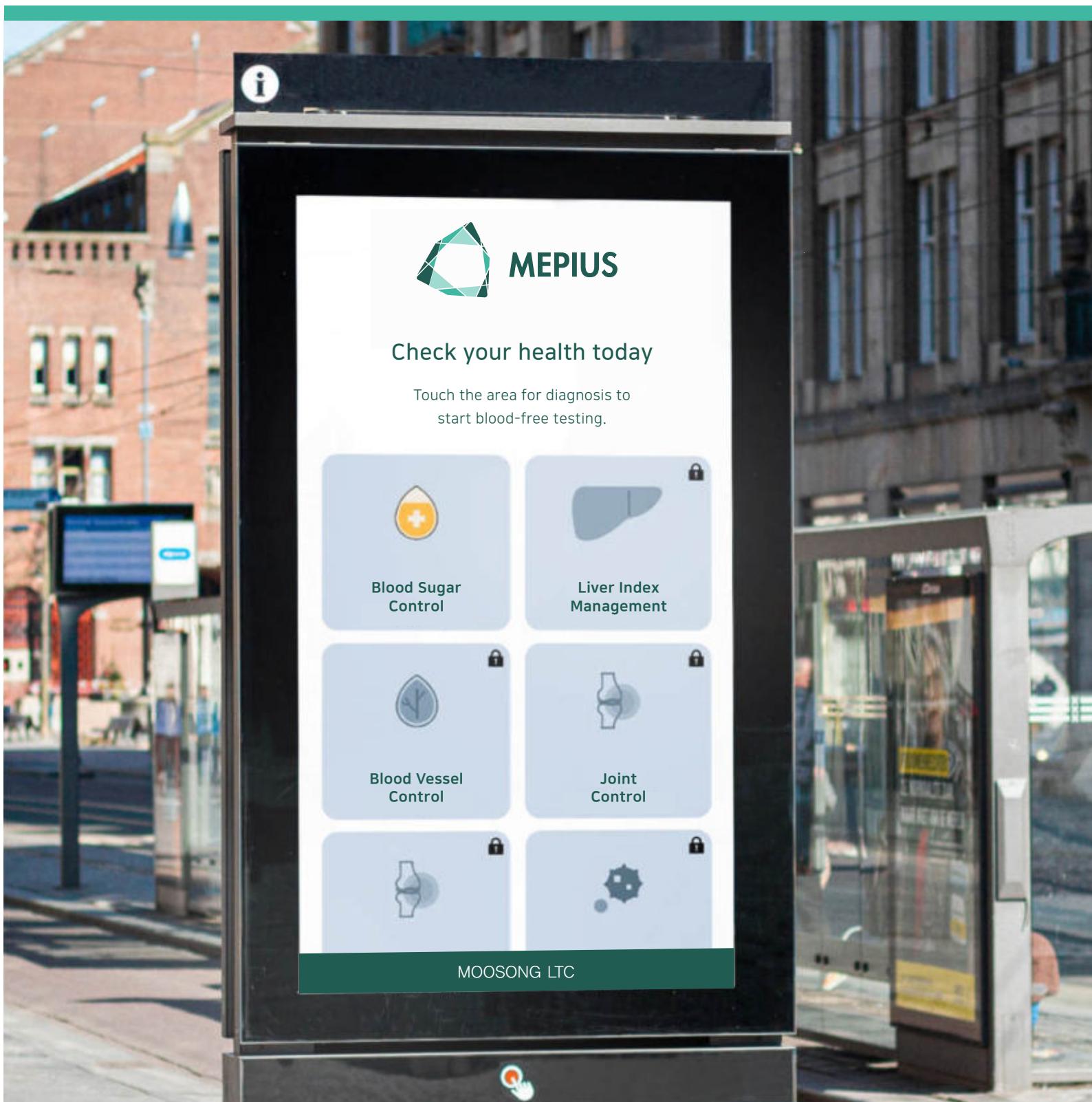
APP is connected to a diagnostic device to have function like recording user's health information onto blockchain and performing user authentication to verify that the user provided the information and interconnecting to the off-chain platform. APP publishes health information to the verified user's blockchain wallet and sends health records so that they can be used in the off-chain platform. It allows users to properly process diagnostic information so that it can be published in blockchain as APP is connected to diagnostic devices.



# 03 Mepius Introduce

## 4) Diagnostic Device

A diagnostic device diagnoses users' physical conditions to publish them into health information. APP interconnected with the diagnostic device requests for user information and creates a wallet address to record the health information onto MEPIUS Mainnet. APP with the user authentication function may record health data in blockchain. Diagnostic devices are not special devices, but devices for health diagnosis in market which can be linked with MEPIUS services.



# 03 Mepius Introduce

## 5) The Roles of Organization (Agency)

Organizations should perform registration and authentication through the MEPIUS team to have access to information that users recorded. The authenticated organizations may inquire data from Mainnet with the user's approval and obtain health information and related user information from the off-chain platform. Regardless of access to the on-chain data, organizations may verify block integrity. In such a case, organizations will build Node-Pool and take part in verification. Organizations that engage in verification may have free access to blockchain data through the operated Node-Pool, but cannot analyze the encrypted data without the user's approval. When creating a project for access to users' health information with the published Smart Contract, organizations should be able to receive data owners' information to have access to the health information. To do so, a Smart Contract may be applied. The contract should contain terms and conditions on interface of user's approval, purpose of data use and rewards offered to users. Organizations may conduct additional surveys to collect necessary information and the collected information may be used.

## 6) Publication and Format of Health Information

MEPIUS-based APP interconnected with a diagnostic device is used to publish health information. The device that displays health information may predefine data sets on available diagnostic information and publish data in a proper format. User authentication is carried out in the device to verify users and publish information. If users fail to perform authentication and conduct a diagnosis, no data will be published and users may only check the displayed information. Data that can be published may vary according to the diagnostic device and predefined formats are applied to data. Such diagnostic information can be defined through HIP.

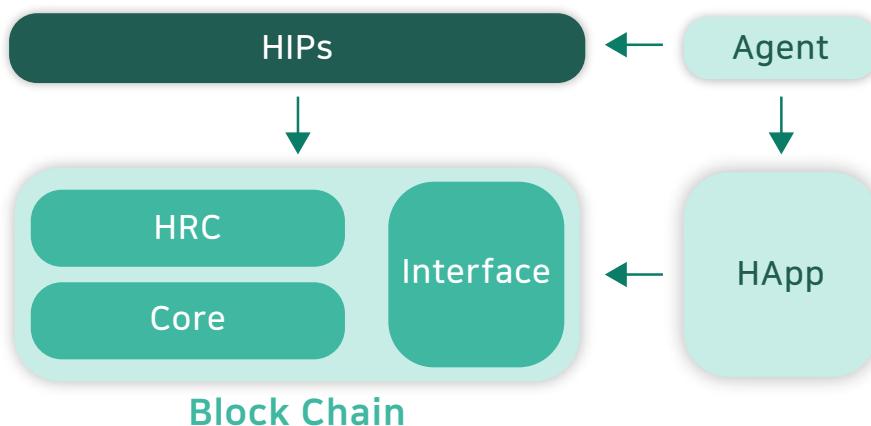
### [MEPIUS Operating Structure & Method]

Users continue to record and save their health information at Mainnet. Organizations may publish a Smart Contract to have access to health information, request access to data from users and offer rewards in relation to data access. Users may approve the published Smart Contract to provide their health information. Organizations must verify that they are reliable agencies with the Smart Contact offered as HRC at Mainnet. The Smart Contract that can be published in Mainnet is in HIP format which can be displayed with the proposed standards. The terms and conditions proposed in HIP is implemented as HRC and operated in Mainnet.

## 03 Mepius Introduce



The Smart Contract of blockchain Mainnet implements the defined interface and communicates with HApp. An organization may prepare a Smart Contract that includes necessary functions and implement HApp to build a service. With the service, the organization defines rewards offered to users and information received from users through the Smart Contract and requests for access to information. If there is health information or any other information that the organization wants, it can be defined as HIP to propose interface construction and it can be implemented at Mainnet. HApp implemented outside blockchain implements interfacing for Smart Contract application.



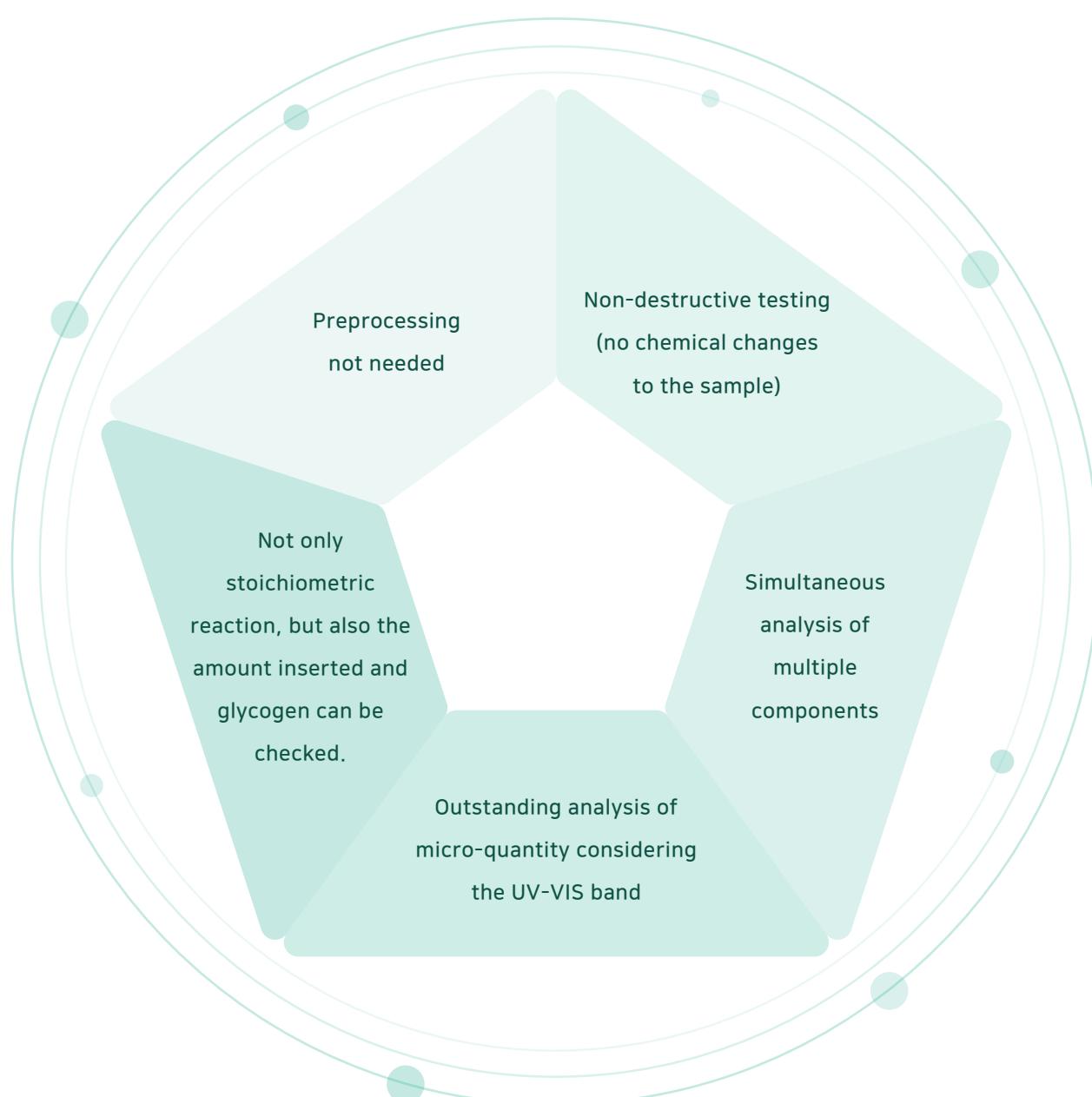
An organization may use HApp and adopt a blockchain network to build a service required for block chain. The organization may propose HIP to implement HApp and request for blockchain updates so that Mainnet functions necessary for the service are available.

# 04 Ecosystem Solution

## 4-1 OPHION Kiosk (OPHION Public Device – Kiosk)

### ● Overview of NIR Spectrometer (OPHION)

OPHION, a NIR Spectrometer is a device that radiates light (NIR) on objects to measure the intensity of light wavelength reflected or penetrated and to detect and analyze the components of objects. Skin prevents light penetration so it hinders blood testing in optical ways. OPHION, a bloodless measuring device that uses near infrared rays penetrates the horny layer of epidermis and envelope (90~95%) regardless of the skin pigment and goes deep into the tissue for medical imaging and blood testing.



# 04 Ecosystem Solution

## ● Overview of OPHION Kiosk

OPHION Kiosk, an unmanned medical examination center applied with OPHION technology is a device for bloodless testing without personal devices. It can be installed in various sites such as places where people frequently pass by or hospitals, high-rise buildings, community centers, airports and embassies so that anyone can access the device. The biggest advantage of OPHION Kiosk is simple authentication using the QR code and people who are not accustomed to IT devices can use the kiosk with ease. Those with smartphones can have blood testing at the kiosk without OPHION Personal Device and receive the test result from their smartphones. When personal health information is uploaded on blockchain, you may even be rewarded depending on the profit distribution rule. Health information recorded on block chain may be used in medical institutes and laboratories authorized by the government or associations and it is practically impossible for unauthorized centers to use the information or use for purposes other than medical researches. When personal health data are accumulated, it will simplify the medical examination process in connection with medical centers, saving time and reducing expenses.

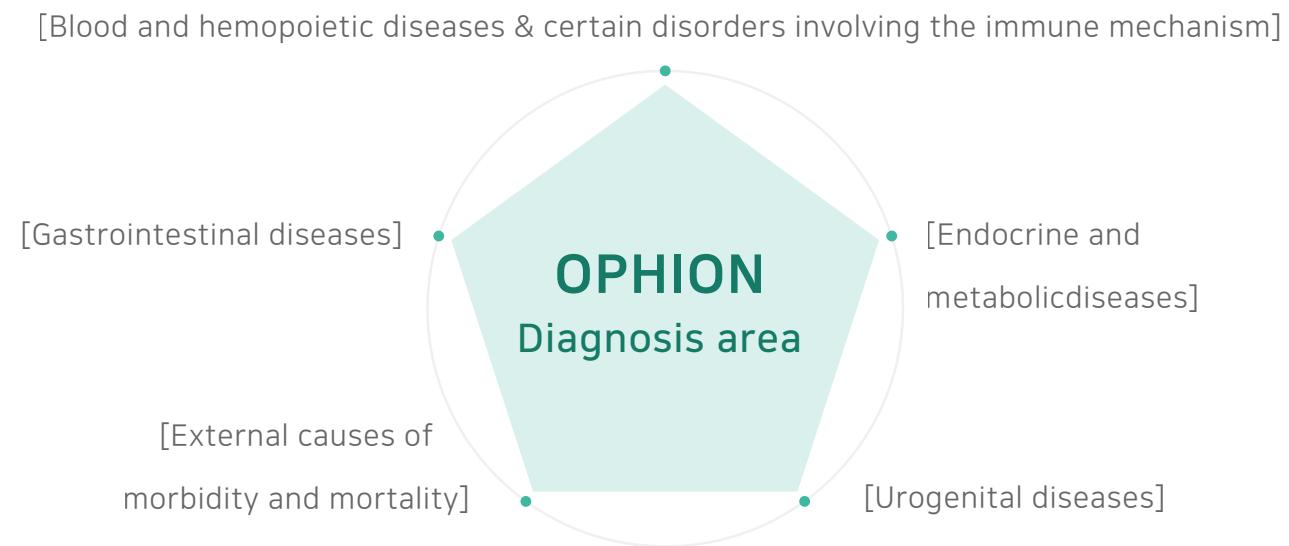
Here are several social changes associated with public use of OPHION Kiosk. It takes about 2-3 days to receive the physical examination result when blood samples are taken. It may take a few hours in large hospitals with blood testing facilities. However, this may be the case in advanced countries with quality medical services. If not, it may take weeks to receive the result. You can receive the test result within a few seconds from OPHION Kiosk, which will maximize efficiency of time required for medical examinations. It will reduce patients' waiting time for blood testing in hospitals or medical centers where lots of patients gather and it will ultimately cut expenses. Most of all, there is no such process for blood testing which will dramatically reduce medical wastes and will be daily changes for health checkup with minimum payment.

OPHION Kiosk interconnects with MEPIUS blockchain for safe management of health information and it generates profit depending on the degree of participation for information collection. Thus, there are reasons for users to take part in medical checkup at the kiosk. As a result, users will frequently visit places where OPHION Kiosks are installed. Additionally, the kiosk may recommend medical facilities nearby (hospitals, senior care centers, clinics, etc.) and even health supplements and restaurants. This will increase the number of people visiting the hospital and more organizations will demand installation of OPHION Kiosks.

Only 1 OPHION Kiosk can cover many people. It does not occupy a lot of space and is less expensive, so it will be more effective when installed in areas with less population or in countries/cities with a low standard of living. The kiosk will be essential in countries with a poor medical environment where people have to pay medical expenses by themselves. When the kiosks are installed in areas around the world, a tremendous amount of health data will be collected with transparency. This will allow us to analyze changes to regional health conditions in real time so that we can quickly cope with infectious diseases and prevent their spread.

# 04 Ecosystem Solution

## ● OPHION Diagnosis Areas



### 1) Gastrointestinal diseases

- Abnormal results of liver function

Liver converts nutrients you take into essential nutrients that your body needs and metabolizes drugs and harmful substances brought into your body so that they are excreted in urine or bile. During the detoxification process, pharmacological actions that are helpful to your body may occur. When your liver does not function well, you will have symptoms such as fatigue, indigestion, anorexia and nausea. You may not notice any symptoms until the liver function is severely impaired, so it is called a silent organ.

### 2) Blood and hemopoietic diseases & certain disorders involving the immune mechanism

- Anemia

Anemia literally means that your body is short of red blood cells. Anemia itself is important, but when it is observed, it may be the sign of a serious disease. So, when you suspect anemia, it is advisable to consult a doctor. Hence, when it is detected, it is important to receive treatment. Yet, it is more important to find out the cause with thorough testing. Treating anemia without accurate testing may prevent diagnosis of the disease that is the actual cause of anemia, which may result in irrecoverable consequences.

### 3) Endocrine and metabolic diseases

- Thyroid disease

# 04 Ecosystem Solution

The representative diseases found in the thyroid gland include hyperthyroidism (Graves disease), hypothyroidism (Hashimoto thyroiditis) and thyroid nodule. When you have the diseases, your thyroid gland bloats and the front part of your neck will swell. You may get overly sensitive and eat a lot because you have a good appetite. However, you will lose weight because of excessive energy consumption and feel easily tired. Also, you may have trouble enduring the heat, sweat more than others and your hands may slightly shake or your heart may palpitate severely.

- Hypercholesterolemia

Hypercholesterolemia may derive from genetic factors. It may appear when you take too much saturated fat and cholesterol from food products such as meat. Its risk increases when you are obese.

- Diabetes

Diabetes is a type of metabolic disorder when insufficient insulin is produced or when it does not function well. The glucose concentrations in the blood rises and hyperglycemia will be observed. It causes several symptoms and signs, and glucose excretes in urine. It is difficult for most patients to diagnose diabetes when they do not feel symptoms or symptoms are somewhat ambiguous with the high blood sugar. When the blood sugar level goes up, you will feel thirsty and drink lots of water. You will go to bathrooms more often because the urine volume increases. Then, you may start to lose weight. When the blood sugar level remains high for a long time, several complications occur in your body, including retinopathy (and you may lose sight), renal dysfunction (renal dialysis may be needed in severe cases) and neuropathy (numbness and pain). Also, the risk of cardiovascular diseases will increase.

## 4) Urogenital diseases

- Menopausal and female climacteric states

Menopause refers to a final completion of menstruation that has been consistent. Generally, women over 40s may suspect menopause when periods are absent for a year without any special causes. When climacteric symptoms are present, it can be diagnosed with ease.

- Male climacteric states

The term, male climacteric states are made because of symptoms similar to menopausal symptoms that may occur in men. Unlike women's menopause, it does not appear in every man and there is a difference between individuals. Thus, its correct term would be 'testosterone deficiency syndrome (TDS) depending on age.

# 04 Ecosystem Solution

## 5) External causes of morbidity and mortality

- Blood alcohol content

When you receive external stimulus, your brain decides what to do and your hands and feet move following the brain's order. When body waste or alcohol is still present in blood because you are tired, it is highly resistant when passing the synapse, so you may have slow reflexes and not move properly. When you drink alcohol, the alcohol content in blood may vary according to the amount of alcohol that you took. It may even remain in blood for a long time, when consumed too much. Physical and mental changes after drinking are caused by several factors such as the alcohol intake, intake rate, individual sensitivity, mental and physical status while drinking and environmental conditions.

[ If multiple users participate in measurement owing to 3-zero characteristics (no pain, no adverse events and no delay) of bloodless testing other than the items described above, it is expected that changes in measured figures can be identified and 4D changes in symptoms are studied to identify signs and symptoms of various diseases. ]



# 04 Ecosystem Solution

## 4-2 OPHION Personal Device

OPHION Personal Device to secure personal health data of MEPIUS conducts blood analyses to identify diverse diseases in advance. Digital calculation of the measured values is applied to identify substances in blood. A handheld personal device interconnects with smartphones and it can be used anywhere with network connection and electricity. The device will be much-needed for patients suffering from chronic diseases such as diabetes because it conducts blood testing without drawing blood samples. It can also be used to find criminals who may be threat to the community, controlling drunk driving or investigating drug users because the blood alcohol content and drug use can be measured with the device. If people without underlying diseases conduct blood testing everyday like fingerprint recognition, it will lead to discovering lots of diseases in early stages and have great impact on public health. Additionally, it will create a crime-free environment with no drunk driving or drug overdose.



# 04 Ecosystem Solution

## 4-3 HApp(Health Application)

HApp refers to a decentralized application that operates in MEPIUS blockchain. Only organizations that can conduct medicine-related researches and statistical researches for the country or association may create HApp. When collecting personal medical information for the purpose of researches or statistics, it was very expensive to collect information from each institute or gather distributed information. Organizations that have created HApp based on users' health data collected through MEPIUS may design data requirements according to the organization's need. HApp created in the process may collect users through websites or smartphones and additional data may be created on the MEPIUS blockchain. It satisfies different roles of each organization and it also separates medical data as well as maintains the organization's independence. Moreover, participating users will receive tokens issued for each HApp, so that they are rewarded. In this way, it will improve the quality of information and increase the number of participations. An organization with HApp may create an application that can independently manage participants.

When organizations operate HApp according to their purpose, the number of MEPIUS block chain participants will naturally increase. Transactions for HApp development, information input and reading require a certain amount of fee. MEPIUS coins are used to pay the fee, so organizations must engage in MEPIUS ecosystem.

Data recorded with HApp may be reused when users and organizations agree to do so. Accordingly, organizations may conduct further medical studies and prepare statistical data. HApp administrators and participating users will obtain profit from new organizations or readers who use the information.

# 04 Ecosystem Solution

## 4-4 Mepius metaverse

MEPIUS Metaverse is a healthcare solution to support minimum healthcare based on user data saved onto MEPIUS on-chain. When the metaverse technology gets popular, data mining applied to remote medical treatment and AI diagnosis will be used to build a platform that offers healthcare services with no restrictions on space and time. MEPIUS Metaverse supports those using various metaverse platforms so that they can easily participate in MEPIUS on-chain and HApp. It analyzes a variety of data patterns that exist in blockchain to provide analysis information that will be utilized in AI and remote medical care services. When MEPIUS Metaverse API-applied metaverse services are installed in smartphones or PCs with network connection, people having trouble receiving quality medical services will be able to use the services.

### [MEPIUS Metaverse Application Cases]

Building a data collection platform based on the collective intelligence of health professionals

Building a remote consultation platform for healthcare and medical experts

Building a metaverse healthcare center in an online virtual space

Building a platform for AI diagnoses of diseases and correcting false medical information

Offering basic medical information of the Medical On-Demand Service

MEPIUS Metaverse may predict signs and symptoms of both minor and critical diseases to support healthcare services, which is applicable to business areas in different sectors. It will assist medical centers and develop innovations that may change the healthcare culture. Above all, MEPIUS Metaverse is intended to build an environment that will encourage healthier lives of people living in areas isolated from receiving advanced medical services.

# 05 Mepius Economy

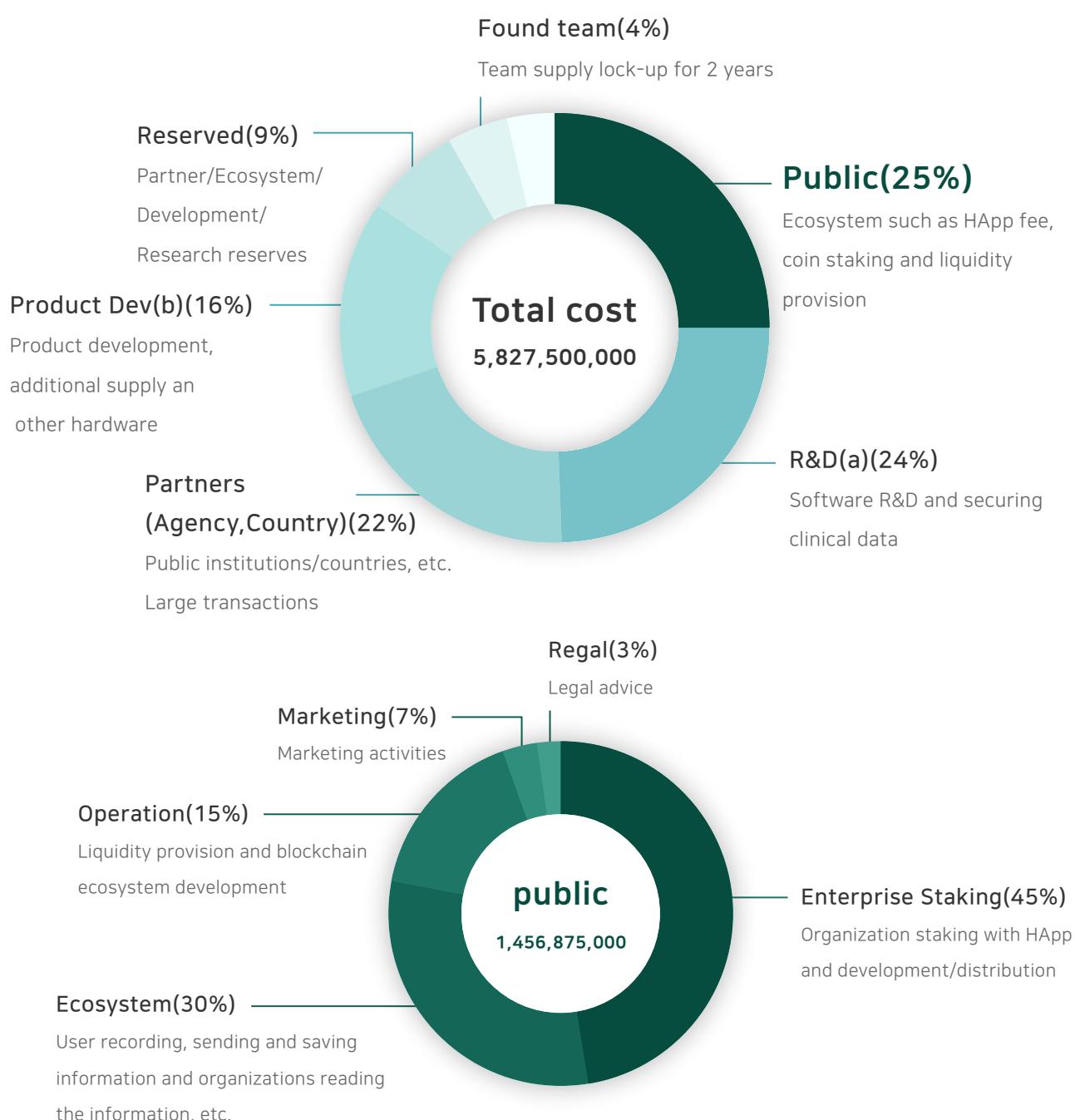
## 5-1 Coin Issuance Related Basic Information

Total issuance : 5,827,500,000 MEPS

Coin name : Mepius ( MEPS )

Coin type : mainnet

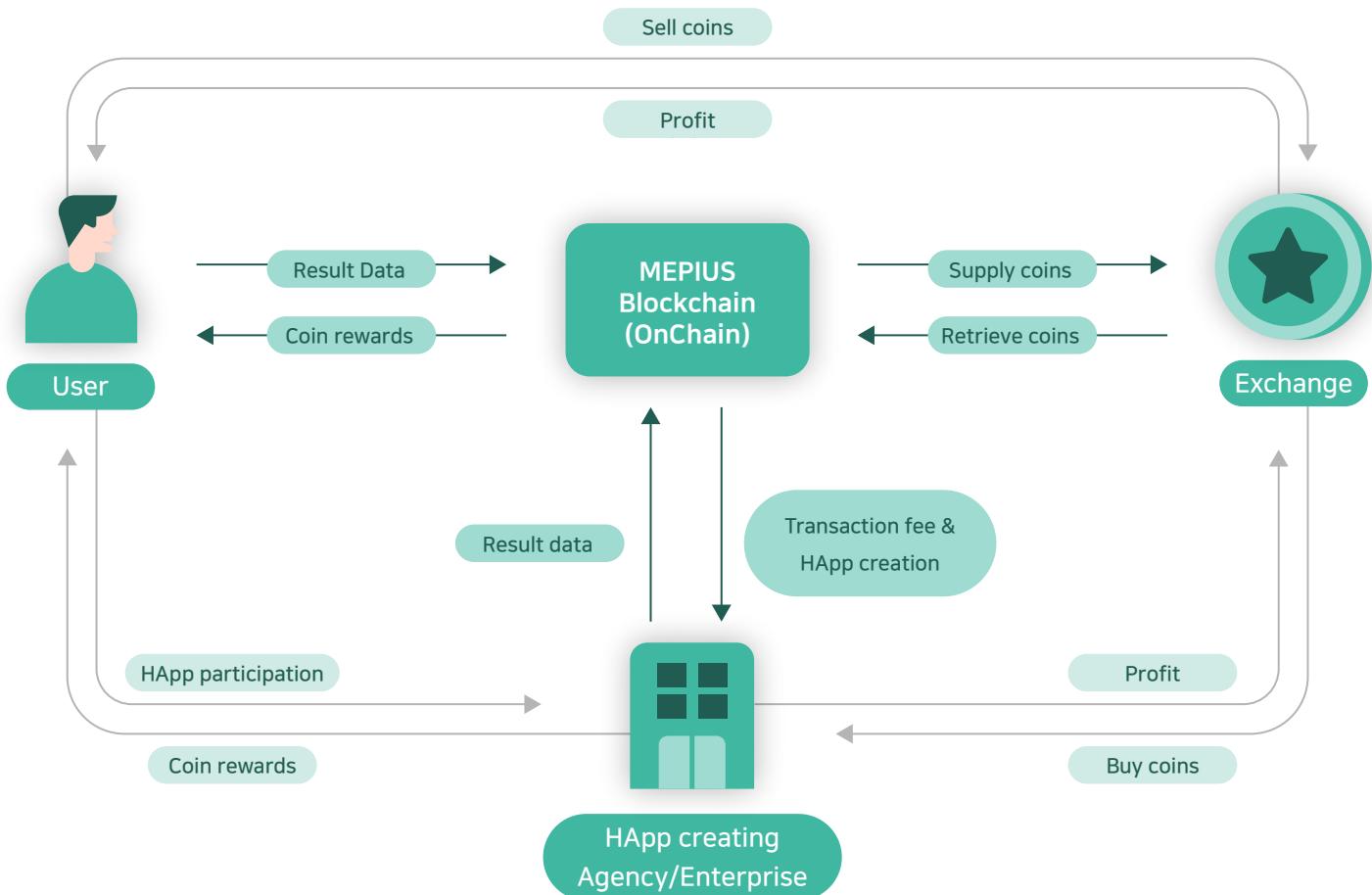
## 5-2 Coin Distribution Plan



# 05 Mepius Economy

## 5-3 Economic Structure

### MEPIUS Ecosystem Structure

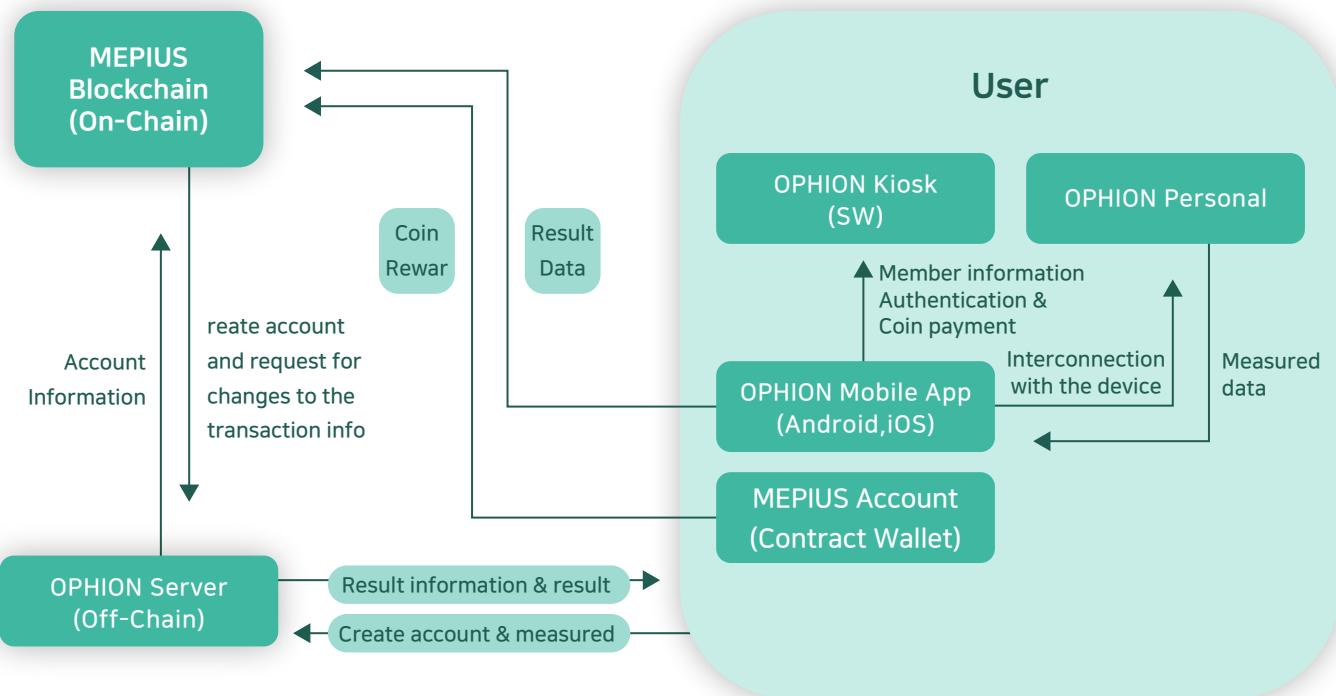


Data accumulated through the MEPIUS blockchain environment and OPHION diagnostic devices may be used in diverse forms other than the purpose of checking individuals' health conditions. MEPIUS ecosystem is composed of organizations (agencies) and laboratories, hospitals, pharmaceutical companies, NGOs (Non-Government Organization) and healthcare enterprises working for the public health and welfare that take part in the ecosystem. These organizations use HApp, one of MEPIUS blockchain functions to build a new data collection item including the users' health data.

For organizations to create HApp, it is necessary to secure and hold a certain amount of MEPIUS coins. The organizations' HApp will receive user data (under the condition that users participating in each HApp agree to provide data) from the on-chain platform of MEPIUS blockchain, and fees are charged for all transactions such as data call and user reward. Additionally, MEPIUS coins may be used to reward HApp participants and users may use MEPIUS coins that they have obtained as rewards or purchased in an exchange to pay OPHION Kiosk fees and MEPIUS-linked service fees.

# 05 Mepius Economy

## ● OPHION Device and MEPIUS Structure

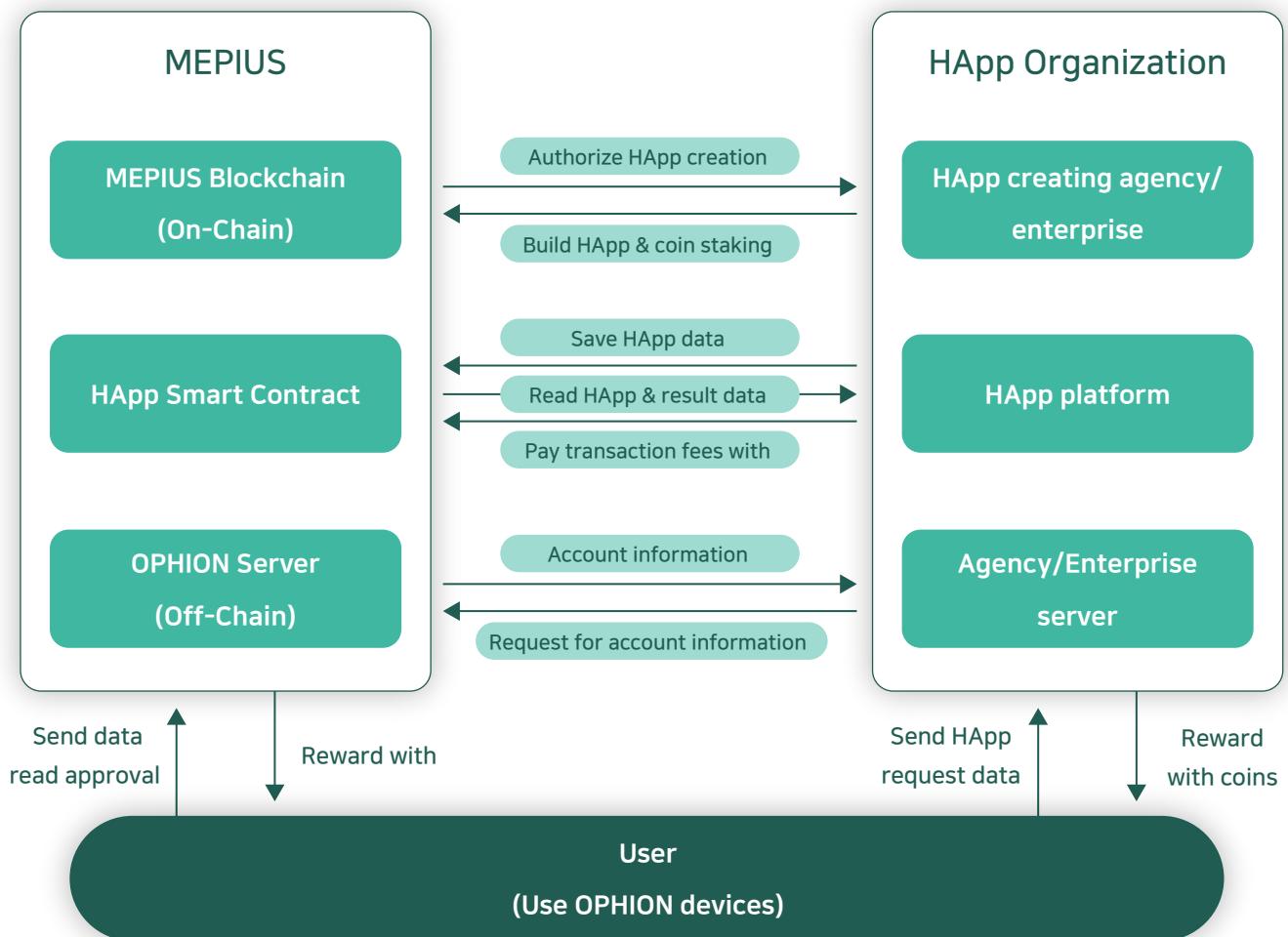


You need OPHION devices to participate in MEPIUS blockchain. Data measured in OPHION devices are sent to OPHION server through the mobile app and they are analyzed to save the result data in the mobile app. OPHION mobile app is used to authenticate MEPIUS account (Contract Wallet) so that MEPIUS coins can be used to pay OPHION device fees and it collects/saves data in OPHION devices. In addition to this, you may choose which health information to analyze among data measured in OPHION devices.

Users may choose data saved in the mobile app through OPHION devices and send them to MEPIUS blockchain. Users will be rewarded with MEPIUS coins depending on their contributions to provide personal health data. Health data recorded in MEPIUS on-chain will be encrypted and saved without personally identifiable information. All data that users saved will be encrypted and no data will be analyzed without the users' private key. In other words, organizations will have access to data only when users participating in HApp approve the access. Also, health data and personally identifiable information are saved in on-chain and OPHION server (off-chain) respectively, which strengthens the data storage strengths of both decentralization and centralization.

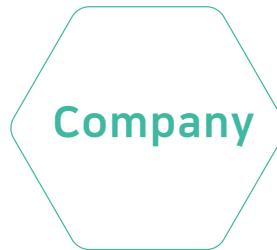
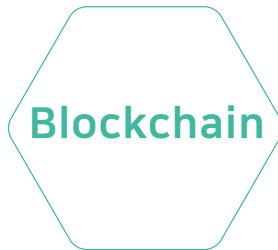
# 05 Mepius Economy

- HApp System Structure



Organizations (Agencies) that built HApp should recruit users who will participate in data collection. If you need existing MEPIUS users for participation, you may introduce your project in OPHION platform. The recruited users will answer questions that organizations prepared and save health data measured (blood testing result) from OPHION devices in MEPIUS blockchain. MEPIUS HApp is more effective than questionnaires for data collection because detailed data can be quickly secured from OPHION, a blood-free measuring device.

# 06 Roadmap



Token issuance -  
APP development -  
Token Scan site -

4Q  
**2021**

- Website development  
- White paper publication

API site development -  
Testnet operation -  
Mainnet function design -  
Mainnet Scan site -

1Q  
**2022**

- Public  
- Personal device prototype development  
- Dex exchange Token listing and sale  
- Marketing

Testnet wallet site -  
PoW (consensus algorithm) development -  
Smart Contract function development -

2Q  
**2022**

- Public  
- Personal device mass production  
- Public device sales  
- Clinical data collect

Testnet node -  
Build configuration and development -  
PoW test -  
Smart Contract function test -  
PoW-based node pool configuration -

3Q  
**2022**

- HApp platform development  
- Personal device sales  
- Trade-related certifications

Mainnet operation -  
HApp search site development -  
Agency authentication site development -

4Q  
**2022**

- MEPS coin listing  
- New product marketing

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