



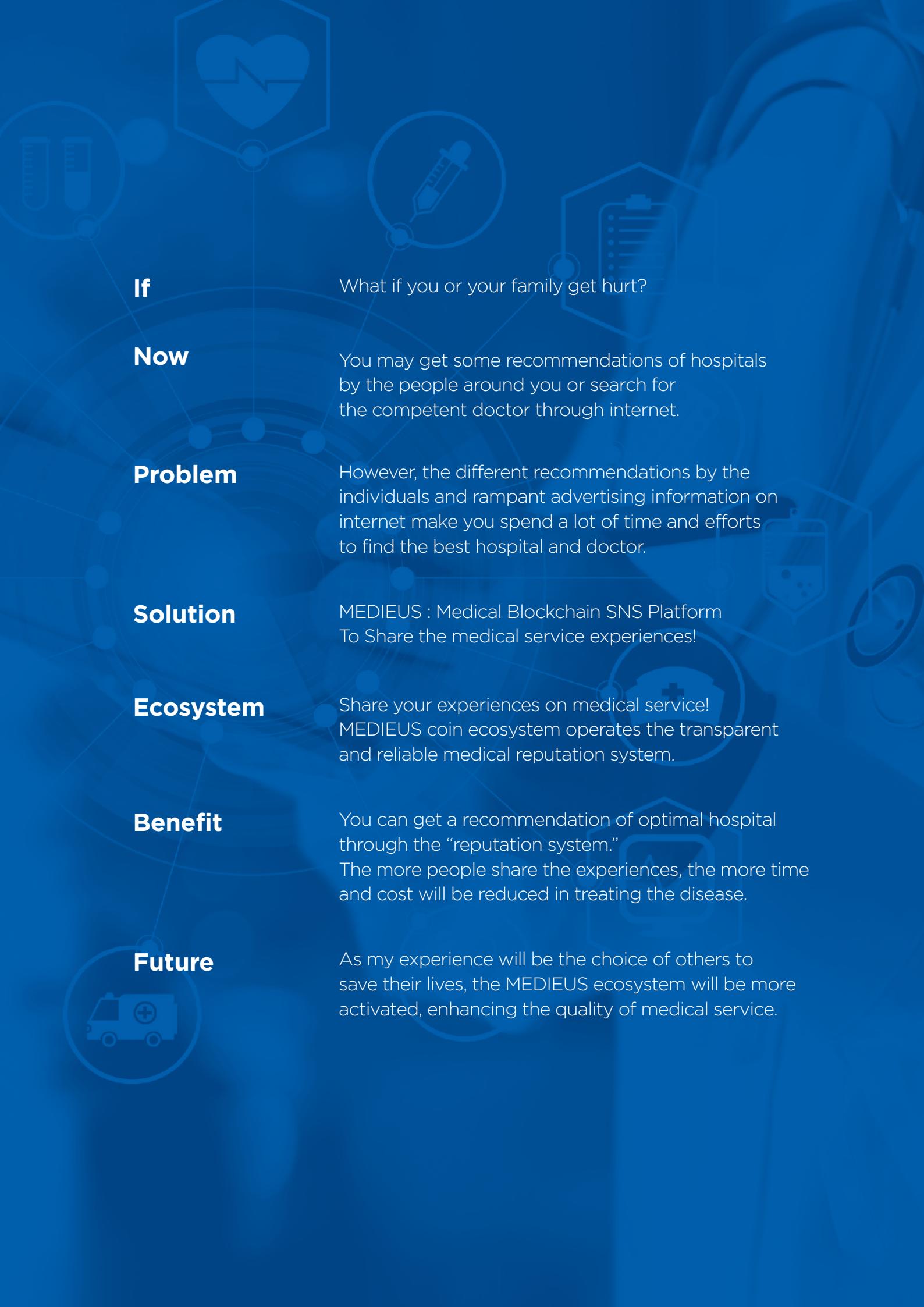
MEDIUS

WHITE PAPER

Medical Blockchain SNS Platform

Innovation in Medical Service Ecosystem
of patients, by patients and for patients

+



If

What if you or your family get hurt?

Now

You may get some recommendations of hospitals by the people around you or search for the competent doctor through internet.

Problem

However, the different recommendations by the individuals and rampant advertising information on internet make you spend a lot of time and efforts to find the best hospital and doctor.

Solution

MEDIEUS : Medical Blockchain SNS Platform
To Share the medical service experiences!

Ecosystem

Share your experiences on medical service!
MEDIEUS coin ecosystem operates the transparent and reliable medical reputation system.

Benefit

You can get a recommendation of optimal hospital through the “reputation system.”
The more people share the experiences, the more time and cost will be reduced in treating the disease.

Future

As my experience will be the choice of others to save their lives, the MEDIEUS ecosystem will be more activated, enhancing the quality of medical service.



Sharing Medical Service Experiences of Patients
「Medical Blockchain SNS Platform」

It is you to start an innovation in medical service ecosystem
of patient, by patient and for patient.

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Abstract

As the current medical service environment is highly exclusive and is not transparent, there is a lot of unreliable information.

Pre-existing social network services (SNS) expose the limitations that they cannot satisfy the consumers who would like to find out the medical service providers with a good reputation offering safe and effective services. In addition, it is the situation that the needs of medical service providers for enhancing the quality of medical service through patient oriented treatment are not satisfied.

The convergence of medicine and IT in the era of fourth industrial revolution is rapidly progressed, which brings the changes in the medical services. Consumers' needs for pursuing the high level of medical services lead to the global market changes, and the size of the global medical traveler's market is significantly growing in Asia regions. Also, the patient-engagement in the medical service environment is getting more important in the advanced countries. Under this circumstance, **a need for sharing platform of consumer experiences on medical service is on the rise, which would enable to choose a medical service provider who is fit into need of individual consumer.**

MEDIEUS aims to establish the desirable medical service ecosystem which benefits both medical service providers and consumers by providing satisfactory enough personalized medical services to medical service consumers fitting their need, and by providing an appropriate assessment on the services to medical service providers, which is achievable by transforming the medical service system from the current provider-centered system to the consumer-centered system.

MEDIEUS platform ① shares information based on SNS data of medical experience from medical service consumers, ② and establishes the reputation system of medical service providers, ③ and recommends a personalized medical service provider who meets the need of the consumer. Through those processes, it enables a reasonable enough treatment, since the patient can be recommended to the proper hospital depending on severity of illness or can receive appropriate medical services.

MEDIEUS is the medical SNS platform on blockchain.

Blockchain technology endows integrity, security, transparency and reliability to the MEDIEUS platform [1]. The MEDIEUS platform, as the representative medical SNS on blockchain, will lead the innovative changes to prevent medical accident and to achieve global medical welfare, through overcoming the limitations of the current medical service information system, and establishing a transparent medical service system being monitored by consumers.

1. About MEDIEUS

- 1.1 Why is MEDIEUS ?**
- 1.2 What is MEDIEUS ?**
- 1.3 Current issues to be solved**
- 1.4 Opportunities**
- 1.5 Ultimate Mission of MEDIEUS**

1.1 Why is MEDIEUS ?

As the interest in medical data is increasing, there are many projects under progress to make use of medical information kept by medical institutes and healthcare data collected by the devices. Under this situation, MEDIEUS platform rather focus on patient-oriented medical experience data, which is expected to provide direct benefit to individual patient through innovation in medical service.

① Importance of medical big data and its utilization

The fourth industrial revolution will advance the future medical paradigms into precise, predictive, preventive personalized medicine, and accordingly, the medical data of individual patient becomes more important. Also, the utilization of medical big data focuses on how to combine the data from different area. Therefore, the medical service is expected to be advanced into the direction of prediction, diagnosis, treatment and follow-ups tailored to the individual patient based on his/her personal mechanism and life style.

② Medical big data management led by government/medical institutes

In the US, the government is leading the high tech medical market by creating the ecosystem of healthcare big data and, in Korea, several large medical institutes are working together on the development of a multi-institutional platform that enables integration and exchange of medical data between institutes, focusing on collection, refinement, process and standardization of the data.

③ Current medical blockchain projects focusing on the decentralized EMR

Most of medical projects on blockchain focus on the decentralization of EMR (Electronic Medical Record) or the development of PHR (Personal Health Record) platforms. Subsequently, those projects have the same goals as the aforementioned centralized medical big data platforms in terms of the EMR sharing and utilizing platform on blockchain technology. It would be worth in the fields of diagnosis, medical treatment, new drug discovery, and clinical trials.

④ Importance of medical service information with high effectiveness for consumer

Most of patients who find some sort of symptoms and would like to find out a right medical service provider are trying to collect information from their friends or web surfing. However, it is extremely difficult to obtain the desirable medical service information before experiencing the services in the current centralized medical service systems due to the exclusiveness of medical service information. In the case of an incorrect choice, a consumer has a fear of life threatening condition. Medical service information affects the choice of patient to a hospital, a doctor, treatment and follow-ups. Decentralized individual medical information on blockchain offers an effective value to the society and company, while decentralized medical service information on blockchain provides an effective value to individual directly.

⑤ Global needs for the medical service information platform with high integrity

According to the WHO's report based on the McKinsey Quarterly's investigation, global medical travelers across international borders is gradually increasing [2] and is expected to reach around 150 Billion US Dollar in 2020. Particularly, it should be noticed that the Asia region takes 38% of medical traveler's market, which means that Asia becomes the main target market in the global medical services. In this regards, it is known that 64% of the global medical travelers acquire medical service information from their friends or those who they know, and 26% acquire the information from web surfing. It is noticeable that most of the global medical travelers rely on agencies to visit the countries to get medical services. Under this circumstance, the medical travelers are exposed to the risk of absence of patient protection system in the related country, an exaggerative advertisement of service providers to attract patient and irresponsible agencies without expertise on the medical services. In order to deal with the risks, it is highly important to establish an objective and reliable medical service information platform.

1.2 What is MEDIEUS ?

We live in a so called homo-hundred era, in which an issue of how to live with health and beauty has become more important by virtue of the outstanding advances of medical and pharmacological technologies than the issue of how to live longer. The active participation of medical service consumers into their medical services also would be another major factor resulting in bringing into this new era.

The treatment of simple diagnosis-prescription-medication can be processed by the telemedicine linked with AI (Artificial Intelligence), rather than by face-to-face treatment. The additional prescription of chronical diseases such as diabetes or high blood pressure is not necessary for face-to-face treatment cost. These are medical services under progress today in the USA.

The medical AI developed by DeepMind that caused AlphaGo shock at the beginning of 2016 is processing the medical records of hundreds of thousands of people provided by the National Health System in UK. The convergence of medicine and IT in the era of fourth Industrial Revolution is expected to increase the quality of medical services. However, the increase of quality of medical service, by nature, is only possible when the quality of overall medical service including services to help the patient treatment on top of direct service by the healthcare provider is improved. The same medical service could be differently delivered depending on provider and situation. The outcome of the treatment of same symptoms by the same healthcare provider, at the same medical institute, could be different depending on the medical environment, patient's engagement and condition of healthcare provider.

In order to enhance the quality of medical service tailored to individual patient, it becomes important to increase the quality of the services based on the big date of medical information and the quality of additional service based on the data of consumer's experiences.

MEDIEUS will shift current medical service system of provider-centered to medical service system of consumer-oriented based on information of shared medical experiences through blockchain technology. This will enable the medical service provider to change and to innovate the medical environment, which will lead to an enhancement of service quality. The increased quality will be brought back to the patients in the virtuous cycle.

1.3 Current issues to be solved

① Medical service system depending on a nation's medical policy

In the case of South Korea, under the government's policy, the National Health Insurance Service has over 1,000 regulations and even more and the Health Insurance Review & Assessment Service (HIRA) has over 10,000 regulations. In addition, those regulations have been frequently updated resulting in difficulties for medical institutions to catch up those regulations. Medical service providers manage their services not for consumers but by the policies to the medical supply market, so called, HIRA medicine.

② Medical service provider centered medical service system

The average number of doctor per 1,000 persons among OECD countries is 3.3 (2.2 doctors in Korea) and the average number of hospital visit per capita is 6.7 times (13.2 times in Korea) [3]. The average consultation time in Korea is 5 minutes. Although the medical service consumer pays the medical cost, the medical service providers take the initiative of quality of medical service due to the dependency on them. It is hard to know which medical service with which processes and methodologies has been administered to the consumers under the exclusive current medical service system.

③ Limitations on the current SNS or patients' community

In order to access to a select safe, cost-effective and time-effective medical service, the patient would like to have information on reputation and objective evaluation about the service provider. Most of them tend to get the information from those who they know or search through internet. The information in the internet is usually not sufficient, or sometimes is not true. There is a lot of exaggerated information through advertisement and unclear and unprofessional information on the related communities on the web. It is reported that fake feedback in SNS is more used for advertising of medical service than information of hotel and restaurant [4].

How is the situation in a certain patients' community? Established in 2004, 'PatientsLikeMe'[5] is the well-known patients' community with about 600,000 patient registered that helps people to voluntarily share their symptoms among the patients with similar symptoms and to take action to improve their outcomes in U.S.A [5]. PatientsLikeMe has raised a fund of total of \$ 130 M with the estimated annual revenue of \$23.7M until 2017 since its foundation [6].

However, PatientsLikeMe shows critical limitations in its capacity as a health information community, since the main services of PatientsLikeMe are focused on the sale of health data to pharmaceutical, insurance, and medical device companies rather than on both benefits of medical service providers and consumers. The number of active patients on the PatientsLikeMe accounts for only under 30% of the total enrolled patients as of 2018, and it is predicted that the accumulated volume of data will not increase dramatically in the future [7].

1.4 Opportunities

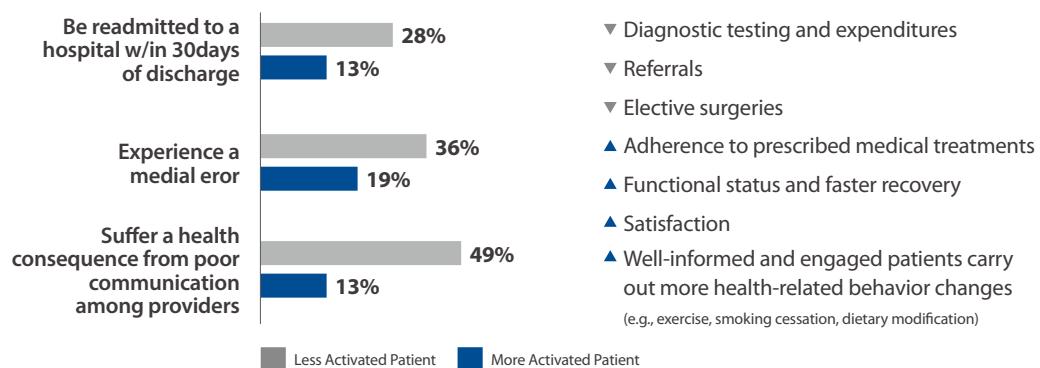
Quantitative evaluation of medical service providers through the global and national certification authorities has been taken place with various evaluation analytics. Medical service providers use these evaluation results for the marketing purposes. Since there are global standards for quantitative evaluation of medical service providers, the evaluation results have a certain level of confidence. However, as it is done one a yearly basis investigation, evaluation to release the result, it is not possible to impact the choice of consumer in real time. Also there is limitation on objective evaluation on appropriateness and safety of medical service as the consumer recognize.

Medical service has the feature of simultaneous occurring of production and consumption, that is, a doctor and a patient are simultaneously participate on the service. Patient's compliance can vary according to the interaction between doctor and patient, and the outcome also can vary according to the participation of the patient. Recently, the engagement of medical service consumer or patient has been more importantly recognized in the advanced countries such as U.S.A.

Medical service consumers contribute the decreasing cost and the increasing the quality of medical services by maximizing the effectiveness of medical services through patient engagement. Medical service providers obtain the objective reputation depending on the results of patient engagement. In fact, according to Bipartisan Policy Center's report, the patient engagement is associated with the following items [10]: [reduction in cost and number of test] [reduction in number of recommendation] [reduction in number of operation] [increase in compliance on treatment prescribed] [enhanced function and fast recovery] [high satisfaction] [high level of understanding in health] [high level of change on positive behavior related with health]

Patient Engagement Improves Outcomes

Higher patient engagement is associated with numerous improvement across various aspects of health delivery



The consumer engagement in the medical service, as a core of the patient-centered service, confirm the experiences and recognitions of consumer, which is the right of consumer and ultimately the important starting point toward improvement of medical service.

1.5 Ultimate mission of MEDIEUS

"Establishment of medical service ecosystem of consumer, by consumer and for consumer"

Our mission is to enhance the quality of medical service through sharing of objective and transparent data based on experience and recognition of medical service consumer, and to establish the medical service ecosystem through innovation in personalized medical services for consumer.

MEDIEUS will enable the distribution of transparent and trustable medical service information, and will help developing ① highly effective, ② applicable in real life, and ③ personalized services for consumers on the basis of medical service data. Both consumers and providers participating in MEIDEUS will interact each other and obtain synergistic effects through reward mechanism.

<Issues and Solutions>

Category	Issues	Solutions
Medical service consumer	<ul style="list-style-type: none"> • Insufficient information about medical service providers & commercialized evaluation/reputation information • Unclear and unprofessional information within the medical service related communities • Difficulties finding information on consumer specific medical service providers 	<p>Reputation system on medical service</p> <ul style="list-style-type: none"> • Data : Consumer's experience/progress (text, picture), personal health records etc. • Consisting engine: assessment/sympathy system, quantitative assessment system <p>AI-based medical service provider recommendation system</p> <ul style="list-style-type: none"> • Output example: medial service providers' recommendation map based on their reputation
Medical service provider	<ul style="list-style-type: none"> • Fake feedback of the medical service consumers with malicious intention • Assessments or patient treatment experience with low reliability and transparency • Reduction of patient size due to the assessment with low objectivity, limited opportunities of medical service providing, spending money to the unnecessary marketing cost beyond medical services 	<p>Consumer reservation/contract system</p> <ul style="list-style-type: none"> • Smart contract and escrow system

2. Innovative medical service ecosystem in MEDIEUS

- 2.1 Decentralized medical service system**
- 2.2 A blockchain-based medical SNS with high transparency**
- 2.3 Strength of medical experience big data by the consumers**
- 2.4 Reputation system with high reliability and objectivity**
- 2.5 An AI-based recommendation system with high objectivity**
- 2.6 Reservation / contract system with high transparency**

2. Innovative medical service ecosystem in MEDIEUS

While most of blockchain-based medical projects of today focus on the increase of accessibility and utility of the medical data through the paradigm shift from the centralized medical information system into the decentralized medical information system, the MEDIEUS implements a realistic and effective medical blockchain ecosystem through producing and sharing the information directly by the consumer.

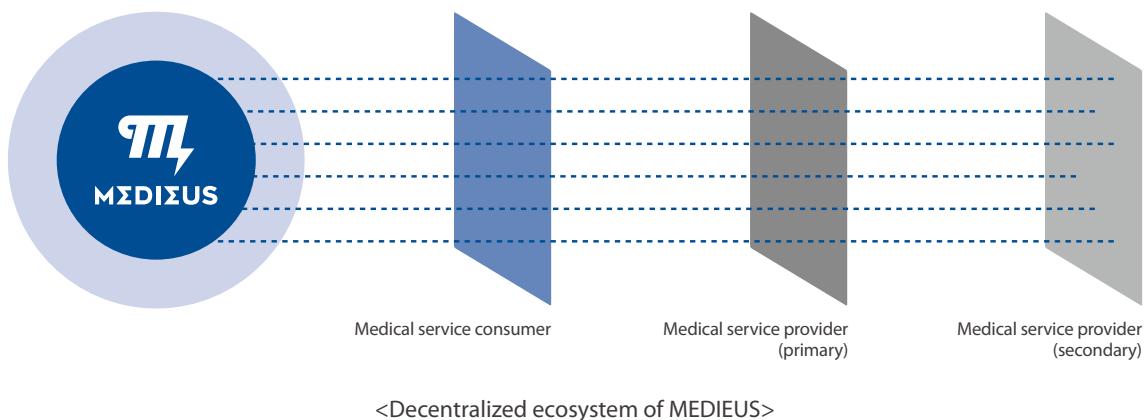
Recently, consumer engagement in medical service has become more important in the advanced countries, and patient-reported experience evaluation has widely been used for improvements of the medical service environments. The MEDIEUS platform will provide the consumer-centered medical service system through decentralization by virtue of blockchain technology.

The MEDIEUS platform will build up the MEDIEUS reputation system by sharing and evaluation of transparent and trustable information of consumer's medical experience data, and will help developing various services and businesses on the platform by providing API and SDK.

MEDIEUS will primarily offer an opportunity for economic reward to both consumers and providers by token issuance, and will also provide an opportunity for value-up of the tokens by widening the channels for token exchange.

2.1 Decentralized medical service system

MEDIEUS, a medical SNS platform on blockchain, is a decentralized ecosystem that is composed of medical service providers and consumers. Medical service providers include the experts in the field of healthcare service, for instance, medical doctors who are working at primary, secondary, and tertiary hospitals and medical care centers or physical therapists. It also includes pharmacies, pharmaceutical companies/medical device companies and related public institutions. Medical service consumers are the individuals who are willing to get the services from the aforementioned medical service providers. Those individuals will form a network on the MEDIEUS platform by MEDIEUS tokens.



2.2 A blockchain-based medical SNS with high transparency

MEDIEUS, a blockchain-based medical SNS platform, endows transparency and reliability on the content of medical service experiences (texts, pictures), patient-experience evaluation results, personal health managing records, and reading records by others recorded on blockchain.

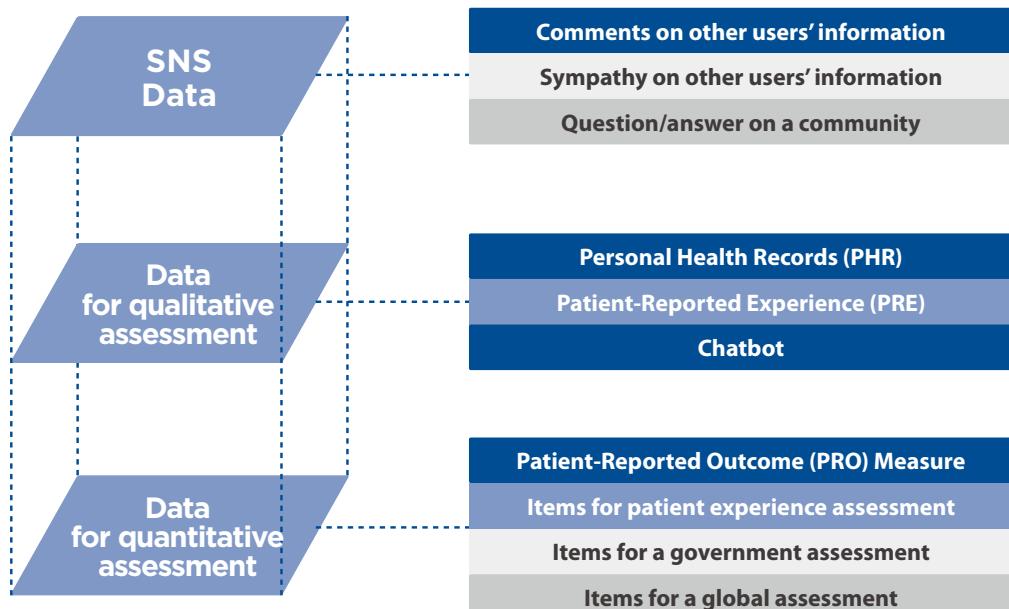
For medical service consumers, MEDIEUS provides a medical SNS system in which medical service consumers share their medial experiences, a reputation system and AI-based recommendation system of personalized medical service provider. For the medical service providers, MEDIEUS provides the consulting/reservation/contract system through AI-based recommendation system, and pursue the improvement of the quality of service based on the reputation system.

2.3 Strength of medical experience big data by the consumers

MEDIEUS collects and saves the medical service data in both structured and unstructured form. Structured data include ① evaluation results obtained from the globally certified institutions or governments, ② patient experience evaluation results, and ③ global standard PRO (Patient-Reported Outcome), PRE (Patient-Reported Experience) results per each disease written by the consumers.

Unstructured data include personal healthcare information, treatment process and progress, service experience feedback through SNS. This information can be mapped into the global standard PRO/PRE categories through AI robot for data collection at each stage. In addition, the medical service consumers will be able to submit their sympathy or opinion on other consumers' experiences through the assessment/sympathy system on the MEDIEUS SNS platform.

MEDIEUS collects data through so called a 'Medi-log' for the purpose of data collection for AI analysis. Collective information including MEDIEUS user's daily life pattern will be written at the Medi-log, and the AI chatbot will be used to collect required information. Token compensation will be made according to the degree of compliance in writing to the Medi-log, and accumulated big data can be widely utilized from the daily life to the disease management field.

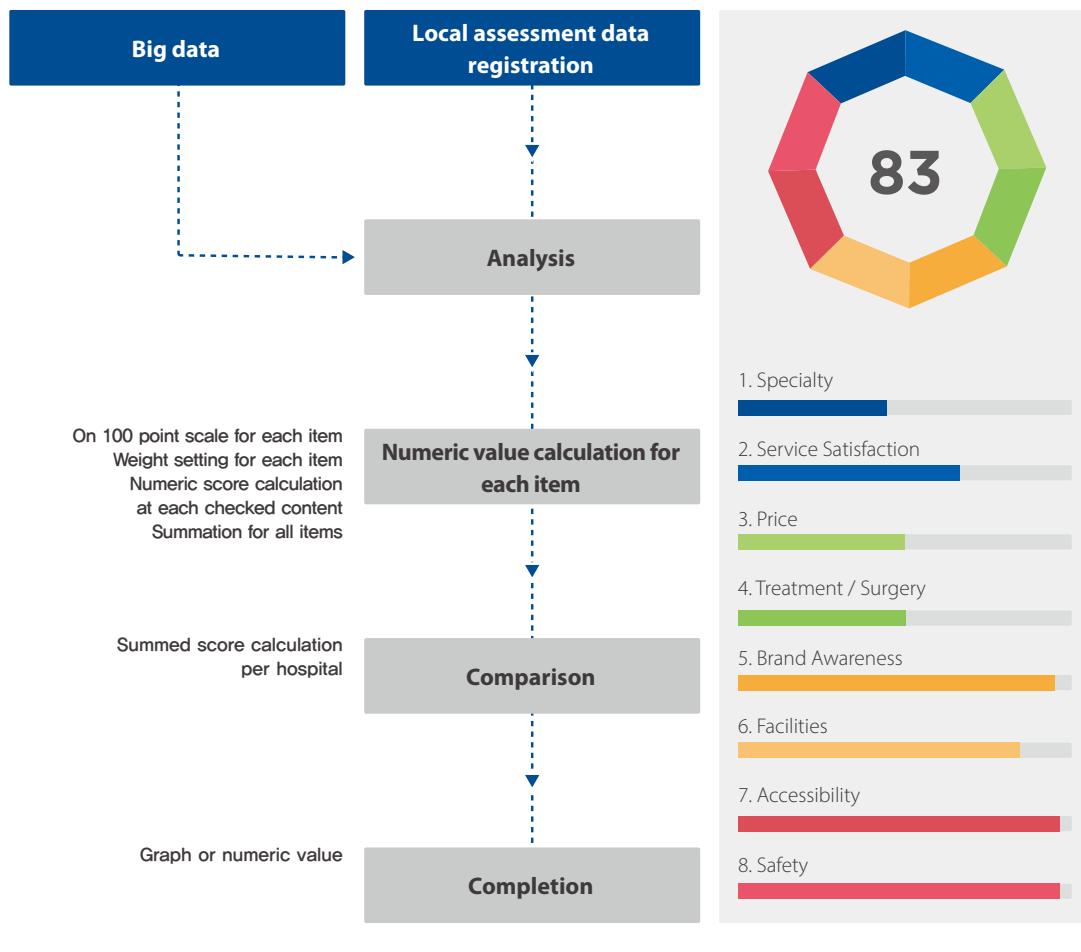


<The range of data collection from consumers>

2.4 Reputation system with high reliability and objectivity

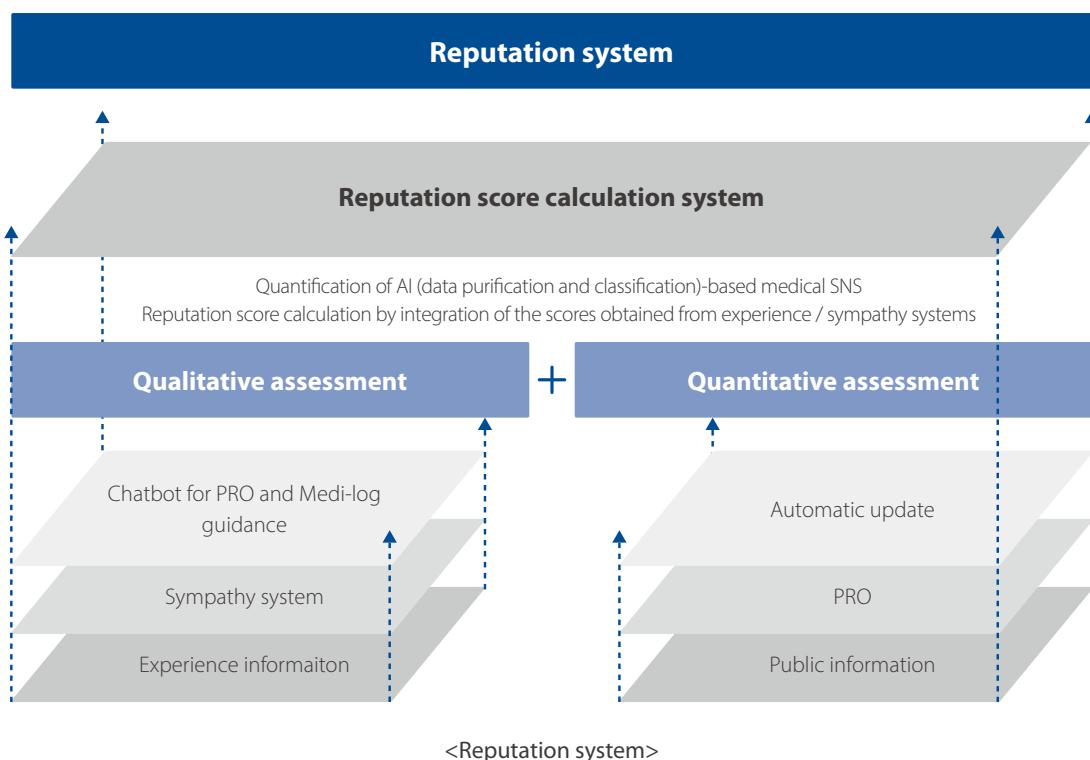
MEDIEUS will build up a reputation system of medical service provider based on the transparent and reliable big data of consumer experiences collected and saved through technologies of blockchain. The reputation system consists of ① quantitative assessment, ② qualitative assessment, and ③ the reputation score calculation system.

- Quantitative assessment: Quantitative assessment for medical service providers of MEDIEUS is linked to the open data of certified institutions, and is regularly and automatically updated. Additionally, the data registered by the medical service provider can be updated at any time. The medical service consumer put PRO and PRE results into the system whenever he/she receive a medical service.



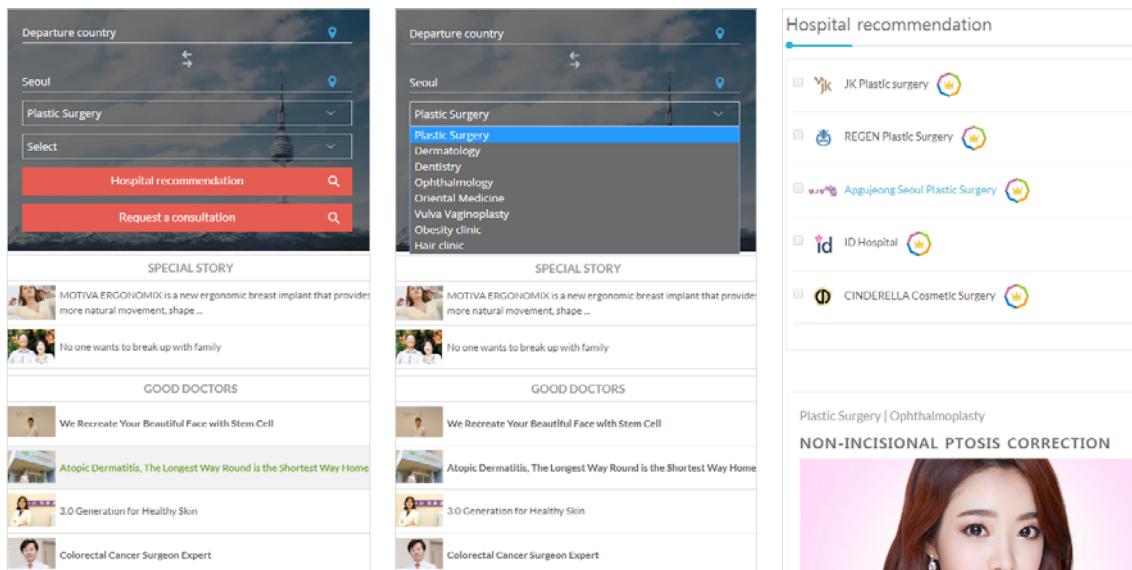
- Qualitative assessment: Medical service consumers can submit any opinion on medical services in the form of texts or pictures regarding their personal health management records and progress after service. The consumers can express their agreement on other consumers' opinions or vote through the sympathy system. Also, an AI chatbot collects data by driving questions and answers to help mapping medical SNS information into items for qualitative reputation calculation.
- Qualitative assessment of the experience/sympathy in the system is transformed into quantitative assessment at the reputation calculation system.

Final reputation score of a medical service provider can be calculated by summation of each quantitative and qualitative assessment scores. Reputation scores yielded through such procedures are utilized to the AI-based recommendation system.



2.5 An AI-based recommendation system with high objectivity

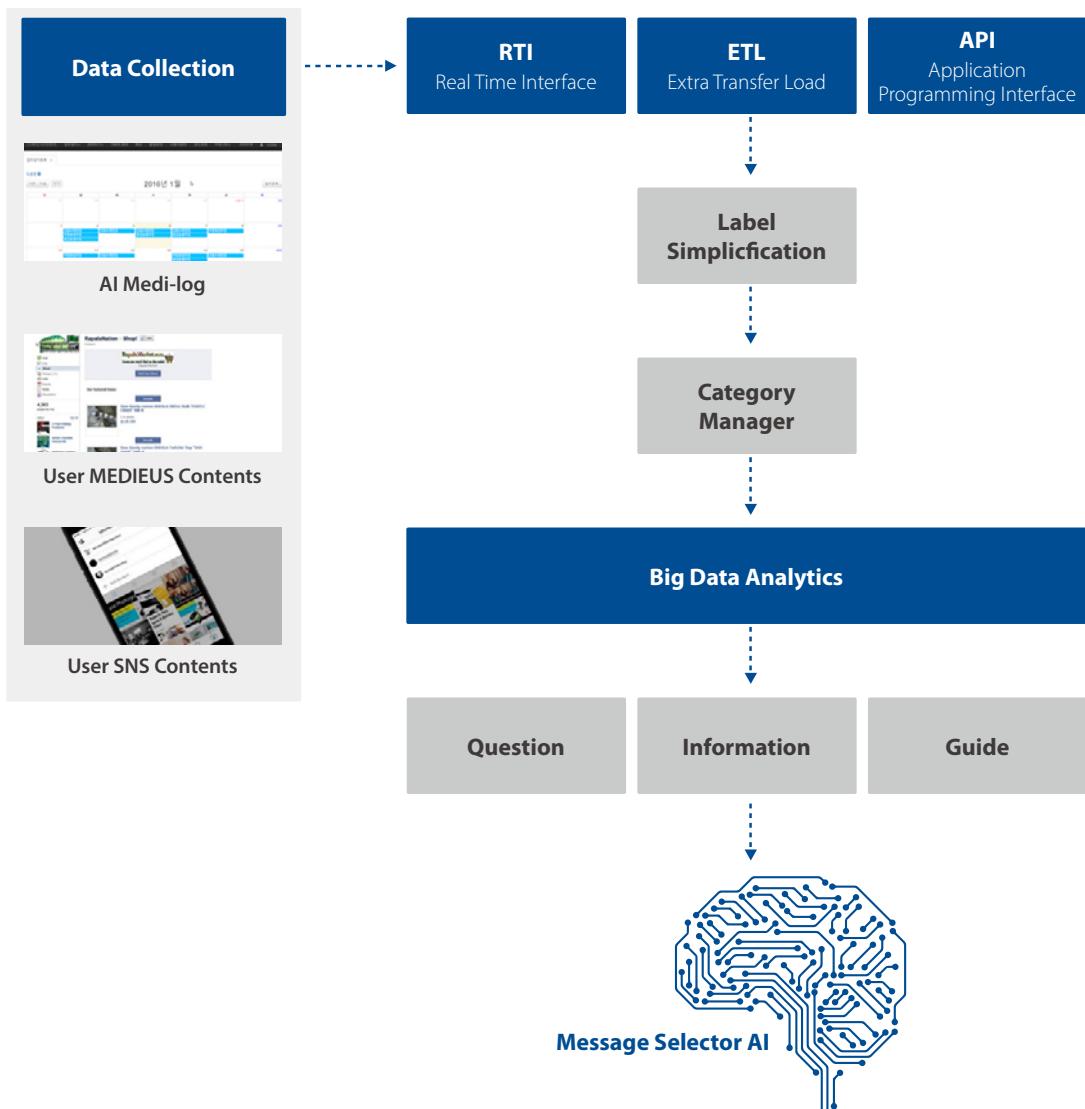
An AI-based recommendation system will be provided to every user on the platform based on the reputation system. If the consumer provides minimally required personal information and his/her medical service experience, he/she would be able to get a recommendation for personalized medical service provider and to process the reservation/payment through the platform.



<User display of AI-based recommendation system>

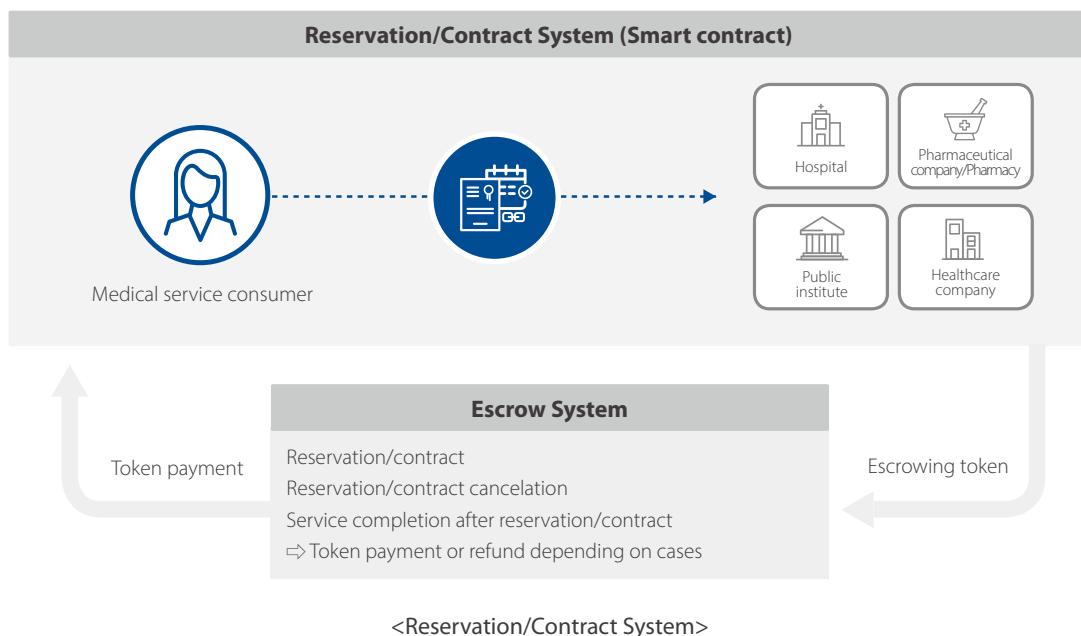
Additionally, medical big data of medical service consumers (information on utility pattern of medical service, information on medical field of interest, information on personal medication, and information on environment of medical service etc.) will be accumulated through the AI-based recommendation system, which will construct the strong MEDIUS medical service ecosystem with the reputation system.

One important element of the AI recommendation system of MEDIEUS is AI-based medical log (so called, Medi-log). In the Medi-log, the sufficiently trained AI to the user helps the user to record more useful information in the Medi-log. The AI in the Medi-log encourages the user to write the Medi-log, which will increase learning rate of the AI, which will be used for users to get information on the optimal treatment from the right doctor, appropriate exercise and food through comparison and analysis with the people who are cured from the disease. Dataflow of the Medi-log is as the following figure.



<Reputation system>

2.6 Reservation/contract system with high transparency



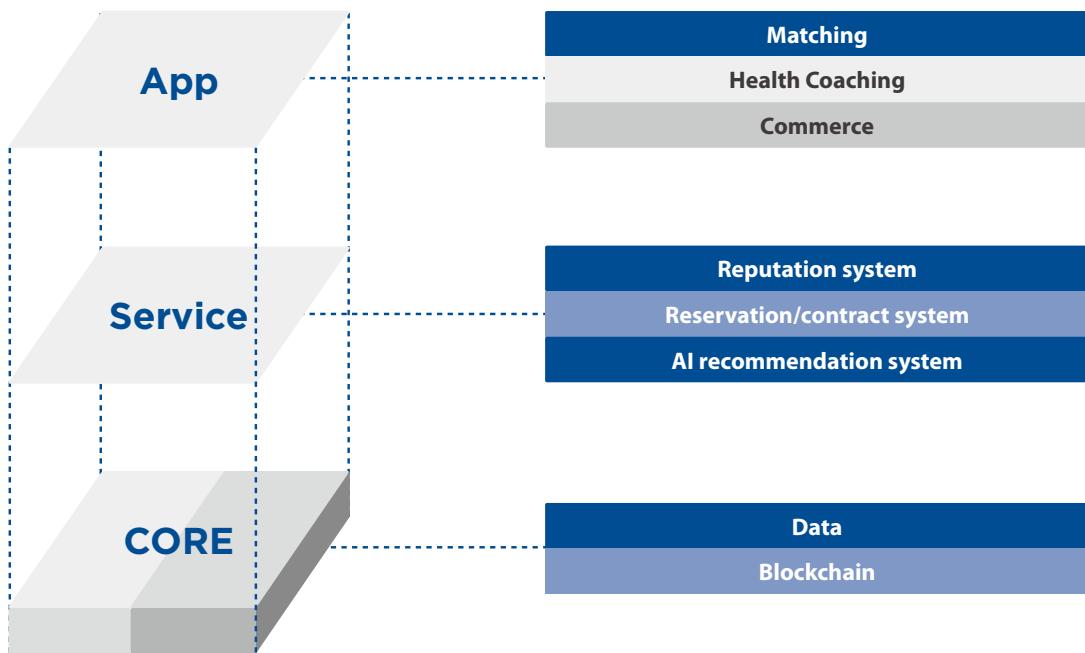
The 'Reservation/Contract system' will act as a fundamental system to deal with all the reservations and contracts in the MEDIEUS platform. If the medical service consumer reserves or contracts with a medical service provider who has been recommended through the MEDIEUS AI recommendation system, the medical service provider can confirm the reservation/contract by making a deposit tokens into escrow. For any case of changes in the reservation/contract, the escrowed fee will be refunded to the provider or paid to the consumer depending on the cases (reservation/contract completion, cancelation, or service completion after the reservation/contract). The amount of tokens will be determined according to the difficulties of the providing medical services, which will be announced at the MEDIEUS platform after automatic calculation in the process of system construction, taking into consideration of establishment of MEDIEUS ecosystem and the types and quantity of big data.

3. Structure of MEDIEUS platform

- 3.1 MEDIEUS platform structure layer**
- 3.2 Components of MEDIUS platform structure**
- 3.3 Distinctive Point of MEDIUS platform**

3.1 MEDIEUS platform structure layer

The MEDIEUS platform is mainly consisted of Core engine, Service engine, and Application layers.



① Core layer

The core layer is a data network between medical service providers and consumers at the MEDIEUS platform, and is a database distributed to protect the data by using the state-of-the art encryption technology. The amount of data to be saved on blockchain is limited, because the amount of data is big and will be constantly increased as the MEDIEUS collect and save the data. Thus, the core layer provides the additional storage that is required to safely save medical service data. MEDIEUS will store only unidentifiable data except identifiable personal information by using the most current version of commercialized big data platform. Hash value will be saved on blockchain to record the ownership, trading, tracing, and rewarding information of the data.

Since the data generated and transferred from MEDIEUS application is delivered after encryption through MEDIEUS SDK (Software Development Kit), only the data owner can decrypt it. The core layer is accessible through the service engine layer. MEDIEUS core layer equipped with data backup and recovery system will function to safely store the MEDIEUS data without any loss.

② Service engine layer

The service engine layer connects the MEDIEUS application layer and core layer, which provide the kernel function to manage consumer information. Service engine layer using blockchain engine provides data input/output function through connection with MEDIEUS core layer. Internally, it mainly consists of reputation system, reservation/contract system, and AI-based recommendation system.

- The MEDIEUS reputation system is a reputation/evaluation system of medical service provider, which is processed by reputation calculation system through collection and analysis of data of medical service experiences and data of sympathy among users. Qualitative data is transferred to the numeric value.
- The MEDIEUS AI-based recommendation system is based on AI technology that works with big data accumulated through MEDIEUS medical SNS, and includes a chat-bot system that enable to provide the personalized services such as recommendation of medical service provider, suggestion of tailored follow-up program, recommendation of commercial goods based on the reputation of medical service provider. AI algorithm to be trained and be used for recommendation will be chosen depending on the types of data. As MEDIEUS platform is activated, the chatbot will contribute to provide precise medical service through advanced communication and training.

Medi-log of MEDIEUS is applicable so as for users to overcome their disease, by providing information on how other person who suffer from the same disease or symptom as the user are treated, which exercise they do, which daily life style helps them, which food they eat, how much painful the disease is, which procedures may happen as the disease getting better. In the Medi-log, the sufficiently trained AI helps the user to record more useful information in the Medi-log, and play a role of providing the required statistics and information in real time so as for users to correctly select which medication they take, which food they eat, which exercise they do. AI in the Medi-log encourages the user to write the Medi-log, leading the increase of learning rate of the AI to users. It will be used for users to get information on right treatment, right doctor, appropriate exercise and right food by comparison and analysis with the people who are cured from the disease.

Another purpose of this function is to help those who are without disease or at the early stage of the disease to set a goal in terms of how they prevent a specific disease or how they become healthy. For instance, if the goal is set for diabetes, the AI medical log will help the users achieving the goal by supporting them planning for diabetes prevention after learning the Medi-logs written by the people who overcome the diabetes about the meal, exercise or medication, and by providing the analysis results regarding how much the user carries out the plans through the Medi-log.

- The reservation/contract system has all records without any falsifying the data thanks to the blockchain technology. In this regards, the consumers with high cancellation rate can manage their credit by escrowing tokens. The actual service and feedback of the service arranged by the reservation/contract on MEDIEUS plat could be rewarded by token, which will lead to proper use of system. Medical service providers can effectively manage their schedule of services and have benefits from increasing consumers through the AI-recommendation system. More details on system such as refund policy will be finalized during system construction, and will be announced through the whitepaper. Escrow system will be used for fundamental system for token escrowing, payment, and refund. The reservation/contract system takes the smart contract based on EVM (Ethereum Virtual Machine).

③ Application layer

• MEDIEUS own business

MEDIEUS contributes to the activation of MEDIEUS ecosystem by running own services with the data accumulated at the MEDIEUS platform. MEDIEUS own business includes commercial activities such as sale of goods, which provide the motive power that activate, maintain and even expand the MEDIEUS ecosystem. In addition, under medical service consumers' consent, the benefits of using the public medical service information will be returned to the data providers on the basis of the token circulation policy.

• Other services: Decentralized Application (Dapp)

It includes all types of application services connecting medical service providers with consumers, which also include applications running at mobile, app or web-based environments. Those applications can access the data through the service engine layer. SDK will be provided in order to make easy to develop Dapps connecting it with the MEDIEUS platform. Even without SDK, it is possible to develop any application to connect with MEDIEUS platform, if it follows API (Application Programming Interface) and protocol. More detailed descriptions about use cases of Dapps can be found in the Section of 5. MEDIEUS use cases.

Category	Matching	Reporting	Commerce	Testing
MEDIEUS own	Medical institute recommendation/reservation		Beauty, healthy food recommendation/sales	
ICT company		• Health coaching service	Insurance recommendation/sales	
Pharmaceutical company/ Institution	Medical clinic maintenance assurance service	• Electric PRO service • Follow-ups service	• B2B supply recommendation/payment • Medication recommendation/payment	Clinical research
Public/ Community				Patient experience survey

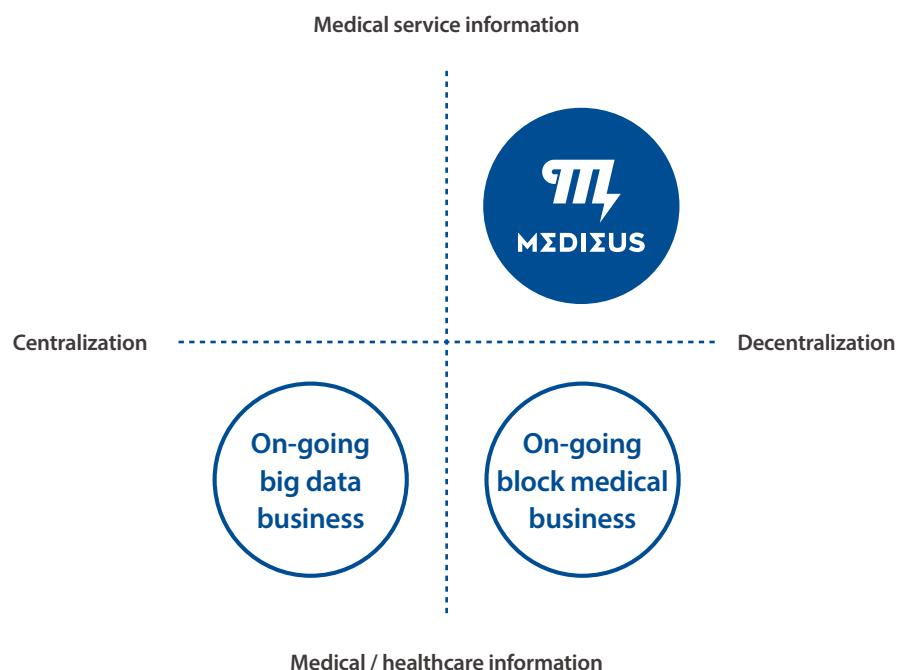
3.2 Components of MEDIUS platform structure

MEDIEUS will employ the most superior platform out of currently functioning ones in terms of popularity, universality, and scalability.

MEDIEUS account can be provided either for a consumer or for a provider, with related roles and privilege to actual role. For the case of medical service provider, it needs to pass through certification system, the account stands apart from that of consumer. To establish an initial ecosystem successfully, medical service providers will be certified through the trustable institutions. Once establishing the ecosystem, the medical service provider certification system can be functioning such a way that the certified providers judge the qualification of the newly registered provider.

3.3 Distinctive Point of MEDIUS platform

- Positioning of MEDIEUS platform



- Beneficial structure for both medical service providers and consumers

The medical service consumer is the starting point of sharing medical service information and its circulation. Medical service consumers have benefits of reasonable and personalized service information through the MEDIEUS reputation system. Medical service providers are able to improve the service environment, not by the government regulations, but by the tailored service to the need of consumer based on the reputation system. It will be beneficial to both medical service providers and consumers.

- Alliances

The first applications of MEDIEUS platform will be the partnership with BNH Korea, Inc. The network on the platform will be globally expanded to Singapore, Thailand, China, and Japan. The global network between medical service providers and its token payment institutions will be built up through the platform subscription. Currently, BNH Korea has more than 100 medical alliances in South Korea including University hospital, general hospital, special hospital, plastic surgery clinics, and general clinics.

(more than 10 University/General hospitals, 60 plastic surgery hospitals, 20 dermatology hospitals, 20 dental hospitals and others)

BNH Korea medical alliances

Category	Contents
General Hospital	Konkuk University Medical Center, The Catholic University of Korea Yeouido St. Mary's Hospital, The Catholic University of Korea Seoul St. Mary's Hospital Asan Medical Center, Soon Chun Hyang University Hospital Seoul
Health Promotion	The Catholic University of Korea Yeouido St. Mary's Hospital Health Promotion Center, CHAUM, Seoul National University Hospital Health Promotion Center, Severance Check-up
Specialized Hospital	Seoul Sleep Center, Nanoori Hospital, Chaum, CHA Biotech, Cho & Lee's Urology Clinic, Samsung Dream Otorhinolaryngology, Nam Ki Se Spine & Joint Hospital, Daehang Hospital, 365mc, Man Clinic, St. Peter's Hospital, Sejong Hospital
Plastic Surgery	HER SHE Plastic Surgery, Dream Plastic Surgery, Grand Plastic Surgery, REBORN Medical Group, Gangnam Gowoon Sesang Plastic Surgery, Izien Plastic Surgery, Global Plastic Group, BRAUN Plastic Surgery, ImageUp Plastic Surgery, Abgujeon Seoul Plastic Surgery, WITH Plastic Surgery, Romian Plastic Surgery, DA Plastic Surgery, Girin Plastic Surgery, iface Plastic Surgery, FLORA Aesthetic Clinic, RUBY Plastic Surgery, THE Plastic Surgery, DIVA Plastic Surgery, LIENJANG Plastic Surgery, JJ Plastic Surgery, MISOU Plastic Surgery, GRACE Plastic Surgery, BANOBAGI Plastic Surgery, EURO Plastic Surgery & Dermatology Clinic, GK Medical Group, SC301 Plastic Surgery, Pitangui Medical & Beauty, Pitangui Lee Na Young Aesthetic & Academy, Comain Clinic, TL Plastic Surgery, Samsung Line Plastic Surgery, JK Plastic Surgery, BONG BONG Plastic Surgery & Dermatology, BYUL-E Plastic Clinic, WONJIN Beauty Medical Group, BK Plastic Surgery, O & Young Plastic Surgery Clinic, GLOVI Plastic Surgery, NAMU Plastic Surgery & Dermatology, April31 Plastic Surgery, Mojelim Hair Surgery
Dermatology, Dental Clinic, ophthalmology	Oracle Dermatology, Kim Sung Wan Dermatology, Leaders Aesthetic Laser & Cosmetic Surgery Center, C&C Skin Clinic, Gangnam Beauty Forever Dermatology, Serion SkinCare, Grace Clinic, Arumdaun Nara Dermatology, Bright St. Mary's Lasik Center, Kim's Eye Hospital, Glory Seoul Clinic, BGN Eye Clinic, Seoul/Busan I Love Eye Center, Sinchon Dain Dental Hospital, New Face Dental Hospital, hushu Dental Clinic, S-Plant Dental Hospital
Korean/Oriental Medicine	Dongbaek miz Korean Medical Clinic, Kwangdong Hospital of Traditional Korean Medicine, Lee Moon Won Korean Medicine Clinic, Myungokhun Oriental Beauty&Mental Clinic, Daezain Korean Medicine Clinic, Jaseng Hospital of Korean Medicine

• MEDIEUS partners – CreSoty

MEDIEUS will work with CreSoty Co., Ltd., pharmacy IT service specialized company, for drug store payment service that will be made with MEDIEUS tokens. Medicine recommendation and sales services will be available with the CreSoty which shares medicine distribution data to consumer/medical institutions through the recently acquired Dailymall

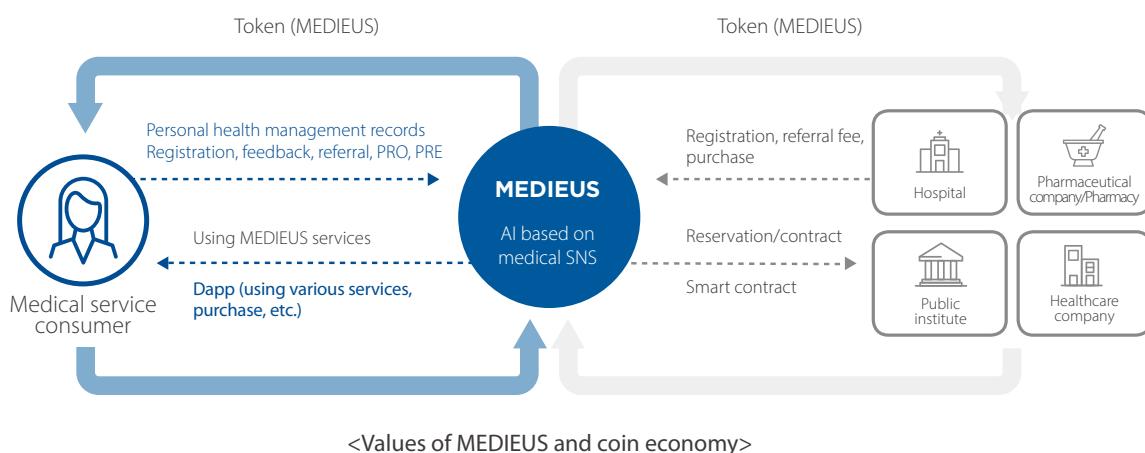
4. MEDIEUS token model

4.1 Token issuance

4.2 Distribution Mechanism

4. MEDIEUS token model

On the MEDIEUS medical service ecosystem, all the participants can be rewarded with tokens depending on their contributions. It supports MEDIEUS medical service ecosystem to keep working without loss of its motive power to provide the benefits to both medical service providers and consumers in a virtuous blockchain medical SNS.



Medical service providers can take MEDIEUS tokens by subscription. Once the reservation or contract is completed through the MEDIEUS platform, medical service providers have to pay the tokens (please, refer to the details about the platform structure layers.) Reservation system, one of the service engines of MEDIEUS platform, is based on the smart contract. Medical service providers can charge the tokens by referral or purchase.

Medical service consumers can take MEDIEUS tokens by registration. Those consumers who input the personal medical service related information in addition to the minimal information required for registration would be eligible for recommendation of medical service provider who would meet the need of consumer. The recommendation system, which is a service engine of MEDIEUS platform, means an AI-based chatbot system or recommendation map based on reputation of medical service provider (please refer to the details about the AI-based recommendation system).

Medical service consumers can be rewarded with writing down their experiences, progress and assessment, and also with registration of new consumer into MEDIEUS platform which is made through referring by the consumer. Medical progress can be noted in the forms of PHR, PRO, and PRE and the feedback on medical service will be reflected into reputation system. (please, refer to the details about the reputation system). Medical service consumers become a main axis of the token economy by using tokens for decentralized application services on the MEDIEUS platform.

4.1 Token issuance

The total capital of MEDIEUS tokens is limited to 10,000,000,000. The initial hard cap would be set at 27,000 ETH during pre-ICO sales and ICO. ETH (Ethereum) will be accepted to participate on MEDIEUS ecosystem as a member. The exact exchange rate per currency will be announced on the official communication channels before ICO.

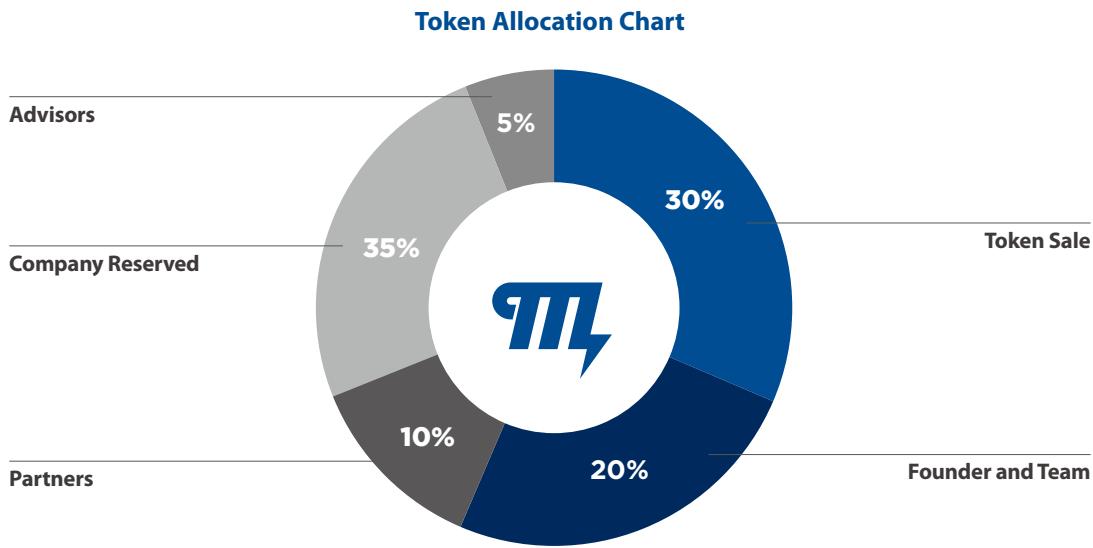
About 30% of the tokens are to be distributed to the participants during pre-sales and ICO. After ICO, undistributed remaining tokens will be eliminated.

Topic	Description
Token Name	MEDIEUS
Symbol	MDEUS
Technology	Ethereum
Total Supply	10,000,000,000
Soft Cap	3,000 ETH
Hard Cap	27,000 ETH
Accepted Currency	ETH

4.2 Distribution Mechanism

① Allocation of MEDIEUS token

The token will be distributed to the members in the MEDIEUS ecosystem according to the following proportions.



• Token Sale : 30%

About 30% of the tokens are to be distributed to the participants during pre-sales and ICO, and about 30% among those would be on pre-sales at the discounted price before an official ICO.

• Founder and Team: 20%

The token will be allocated to the team member for 16 months from December 2018, an expected official ICO until 1st Quarter of 2020, an expected official launch of MEDIEUS platform. Token allocated to MEDIPOS team will be provided by 1/16 per month, and the new member will take the remaining tokens in case of any change in member during the period above mentioned in the same manner for the previous member. Token provided to the MEDIEUS team will be unlocked once the official MEDIEUS platform is launched.

• Advisor and Partners : 15%

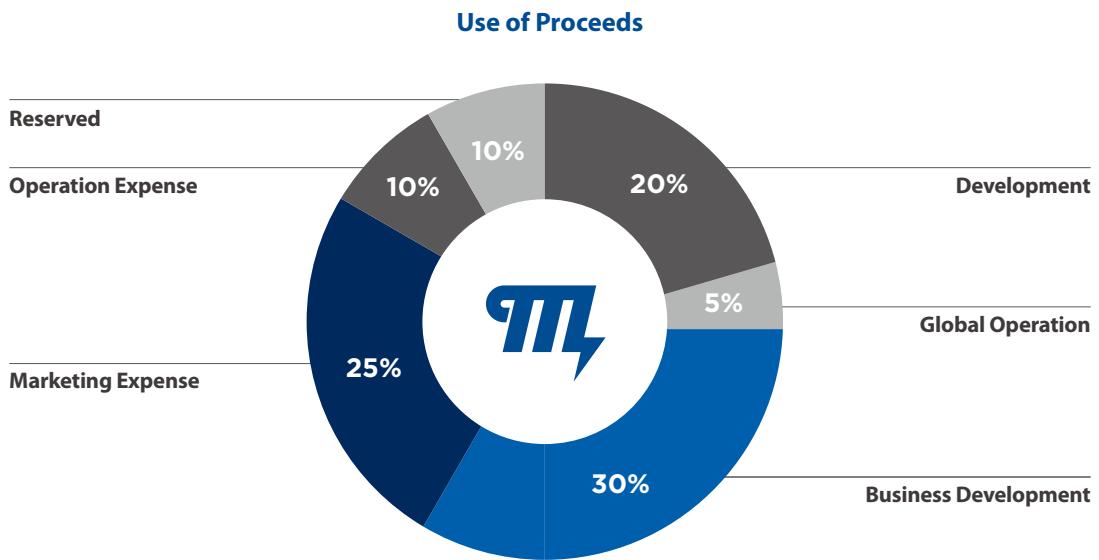
Token will be distributed to the advisors and partners in the medical, technology and business development of MEDIEUS.

• Company Reserved : 35%

Company reserves the token for the case of expansion of MEDIEUS ecosystem.

② Allocation of MEDIEUS token

The proceeds funded through token sales will be used as follows.



• Development: 20%

The MEDIEUS will establish a desirable platform for ideal medical service ecosystem, which provides benefits to both medical service providers and consumers. This portion will be used for this purpose. It includes the costs for developing the structure components of platform such as AI-based recommendation system, reservation/contract system, reputation system, and the UI/UX testing for building dataset.

• Business Development: 30%

The MEDIEUS ecosystem can be possibly operated on the basis of the transparent assessment and reputation system between medical service providers and consumers. To this end, the initial ecosystem should be built up by attracting the minimum number of users at the early stage of the platform. The business development expenses will be used to design the fundamental platform, and to activate and vitalize the MEDIEUS platform. It will be also used for development of the business model in terms of global expansion.

- **Marketing Expense: 25%**

The marketing expense is essential to activate the MEDIEUS platform. Once a stable MEDIEUS ecosystem is built up, the MEDIEUS platform will be operated by active participation of medical service providers and consumers. The marketing expenses will be used for vigorous marketing for establishment of the initial ecosystem, which is required for structure the fundamental ecosystem.

- **Operating Expense: 10%**

Operating expense includes cost for operation of MEDIPOS and for establishment of MEDIEUS platform.

- **Global Operation: 5%**

This expense will be used for operation of the global offices to expand the MEDIEUS ecosystem globally.

- **Reserved: 10%**

This expense will be used for maintaining and updating the platform.

5. Use Cases

- 5.1 Use cases according to the target and category of services**
- 5.2 Other applicable use**

5.1 Use cases according to the target and category of services

① Target users and service categories

Category	Matching	Reporting	Commerce	Testing
MEDIEUS own	Medical institute recommendation/reservation		Beauty, healthy food recommendation/sales	
ICT company		• Health coaching service	Insurance recommendation/sales	
Pharmaceutical company/ Institution	Medical clinic maintenance assurance service	• Electric PRO service • Follow-ups service	• B2B supply recommendation/payment • Medication recommendation/payment	Clinical research
Public/ Community				Patient experience survey

② Personalized recommendation service

MEDIEUS platform recommends some hospitals that meet the requirement and purpose of medical service consumer and the consumer can select one of recommended hospitals. Medical service consumers can trust the process and follow-ups of the medical service through the transparency and reliability of the MEDIEUS platform.

For instance, the personalized hospital recommendation service for a cosmetic and plastic treatment is available. The techniques for the cosmetic and plastic surgery of South Korea are regarded as the best in the world. The consumers in the MEDIEUS platform can safely receive the medical services of Korea in the field cosmetic and plastic treatment. With a recommendation of cosmetic and plastic service providers who meet the need of consumers, the all the services from reservation to the actual service will be arranged through MEDIEUS platform. The consumers can trust the progress and follow-ups of the service on the trusted and transparent MEDIEUS platform. In addition, every treatment type, progress, and symptom improvement across treatment phases can be easily monitored. Even after the cosmetic procedure or plastic surgery, the consumers can safely and consistently manage their follow-ups at the third-party medical service providers recommended without any spatial restrictions.

All services at the MEDIEUS platform not only connect the medical service providers with consumers, but also provide optimal condition through price comparisons, and help consumers to search for necessary services. All the services on the MEDIEUS platform guarantees transparency since any data cannot possibly falsified and is kept 100% authenticity. The outcome of the treatment can be improved based on the guaranteed safety and security of procedures including checkup the changes and recognition on the progress of the treatment depending on type of treatment, process and progress.

Example of automatic recommendation system

Example of consulting display with a recommended hospital

Example of contract display with a recommended hospital

③ Electric PRO service

Medical service providers can improve the quality of their treatment by easily acquiring the patient experience through an electric PRO service. It will also be possible to do an objective assessment for medical service provider through assessment for the degree of treatment improvement in comparison with other medical service providers or institutions.

④ Health coaching service

The MEDIEUS platform enables a personalized health coaching service through the AI-based recommendation system based on the personal health managing records and medical service history of the consumers. The accumulated medical SNS data of the MEDIEUS and AI-based Medi-log data will be usefully applicable for a healthcare company to develop a program helping the personalized health management with a suggestion of fitness program or a healthy diet.

⑤ Medical clinic maintenance assurance service

The medical service consumers in the MEDIEUS ecosystem can share information on medical service providers' service per se and their medical clinic maintenance assurance as well. Information about the medical supply maintenance, medical devices' condition, and the state of inside of clinic can be shared with other consumers, which is associated with medical service providers' reputation. Thus, the medical service providers are enforced to pay more attention to the medical clinic maintenance assurance. It would contribute to prevent medical accidents not by medical service but by improper maintenance, which let the medical service consumers get the services with trust. This service will bring to the trace of medical device's history and the trace of medical supply maintenance history.

⑥ Information sharing and sales of the medical devices for cosmetics

This service can provide assessment/reputation results of the cosmetic devices or new medications to the consumers, and can recommend those products with the personalized information. All sales and purchases can be done at the MEDIEUS platform with tokens. The sharing and circulating information obtained from the consumers can be utilized to improvement of the product.

⑦ Medical experience evaluation service

Patient experience assessment is the most important factor for the evaluation of the quality of the medical treatment. Regardless the differences in assessment methods and utilization plans, many countries consider on how to use patient experience for the good quality of medical services to the people. In the case of South Korea, several institutions such as Health Insurance Review & Assessment Service have been doing the assessment for the quality of medical services. Accumulated huge amount of medical SNS data through the MEDIEUS platform will be usefully applied to such assessment.

⑧ Referral service to a pharmaceutical company (at a clinical center)

A pharmaceutical company get an information necessary for recruitment of patients for clinical trials based on the categorized consumer information accumulated medical SNS data in the MEDIEUS platform. The patient who has a specific disease can participate into the clinical trials associated with new treatment by receiving information from the MEDIEUS recommendation service.

⑨ Patient information sharing service

At the MEDIEUS platform, the consumer who suffers from a certain disease or symptom can share his/her information with other consumers who suffer from the same disease or symptom. In order to overcome the disease, the consumers who have a common bond of sympathy can obtain some help by recommending good quality of medical services related the disease or by sharing information.

5.2 Other applicable use

① Services of the sharing experience of medical insurance and personalized insurance

Currently, there are various types of public or private medical insurances. Because the insurances and their regulations are extremely complex, sometimes the medical service consumers are not fully covered by the insurance. Once the medical insurance experience sharing service is settle down on the MEDIEUS platform of the blockchain medical SNS, it would be possible to make a bottom-up suggestion from the medical service consumers to the insurance planner with respect to the issues to be revised in a public insurance system and/or the disease to be needed covered by insurance. Such process will help to improve health/medical insurance system in a way of the exclusion of the unnecessary items and the inclusion of the newly required items according to the changes of the medical service systems. The medical service consumers get some benefits from those changes toward the optimal health/medical insurance system.

The business on Insurance claim and payment services through blockchain have experimentally been performed. Insurance service on the MEDIEUS platform enables the medical service consumers to be automatically claimed and covered by their insurance after parallel check between the consumers' medical information and insurance terms once the medical services is completed through the MEDIEUS platform. It can be traced whether there are any issues on insurance claims, or whether insurance money is correctly computed according to the insurance terms. Planning and recommendation of Personalized insurance to the medical service consumers can be provided based on the personal medical service visit pattern analyzed through the MEDIEUS platform.

② Prediction service for personalized adverse drug effect

Even the over-the-counter drugs or nonprescription drugs, the types and dosage evoking personal adverse drug effect vary depending on individual characteristics, and, it is hard to find information on what actions and responses happens when several medications are administered simultaneously. The AI-based recommendation service on the MEDIEUS platform can provide the predictive service to help understand whether a drug may result in the adverse event, and whether a drug can be simultaneously administered with other drugs, like that.

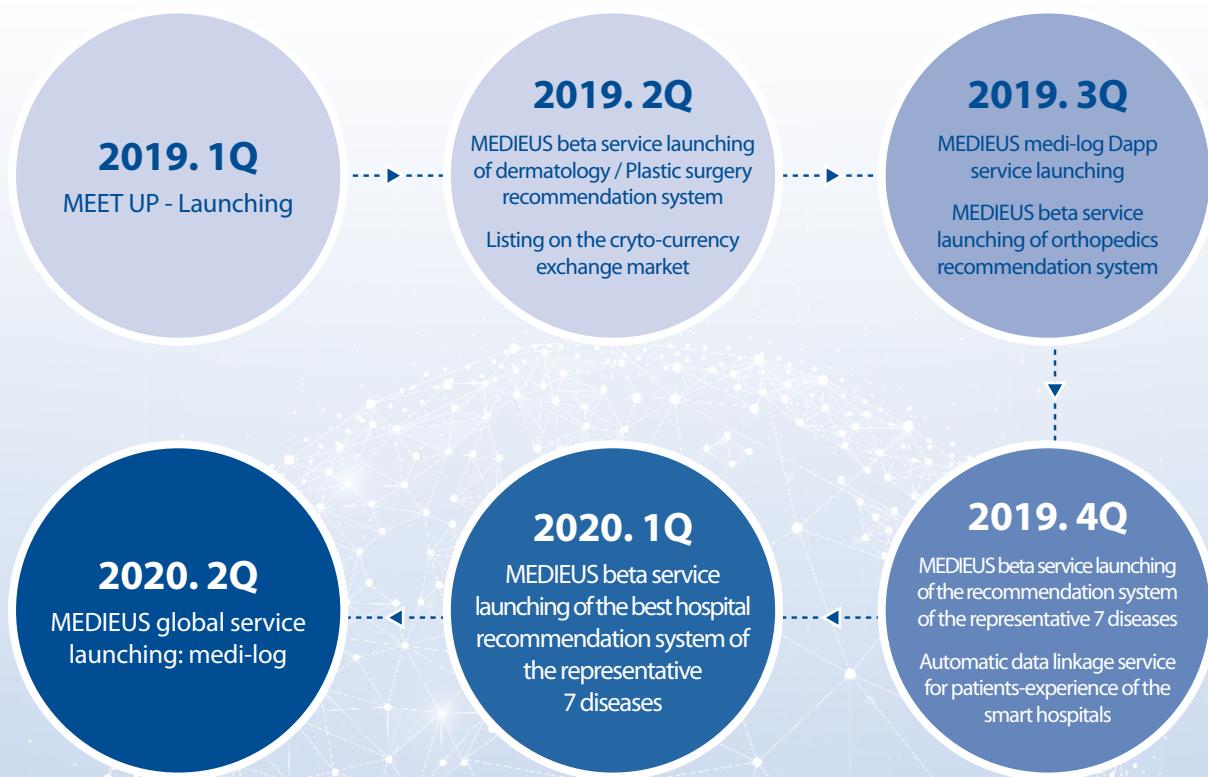
③ Donation service for the medical welfare of the community

In addition to establish a desirable medical service system, the MEDIPOS team also aims to the medical welfare of the community of which all member benefits from the medical services. In the MEDIEUS medical service ecosystem, although the MEDIEUS tokens can be primarily used for the MEDIEUS members themselves, a donation service to support the socially disadvantaged groups and the patients who suffer from the incurable or rare diseases is also available to achieve the medical welfare of the community where the MEDIEUS members belong to. It would be possible to introduce a member who needs a medical help to the MEDIEUS and the following token-raising to support that member by using the MEDIEUS personalized medical service.

6. Roadmap



6. Roadmap



7. Disclaim



7. Disclaimer

This whitepaper is intended to provide detailed information to anyone who is interested in the platform and team of MEDIPOS PTE, Inc.

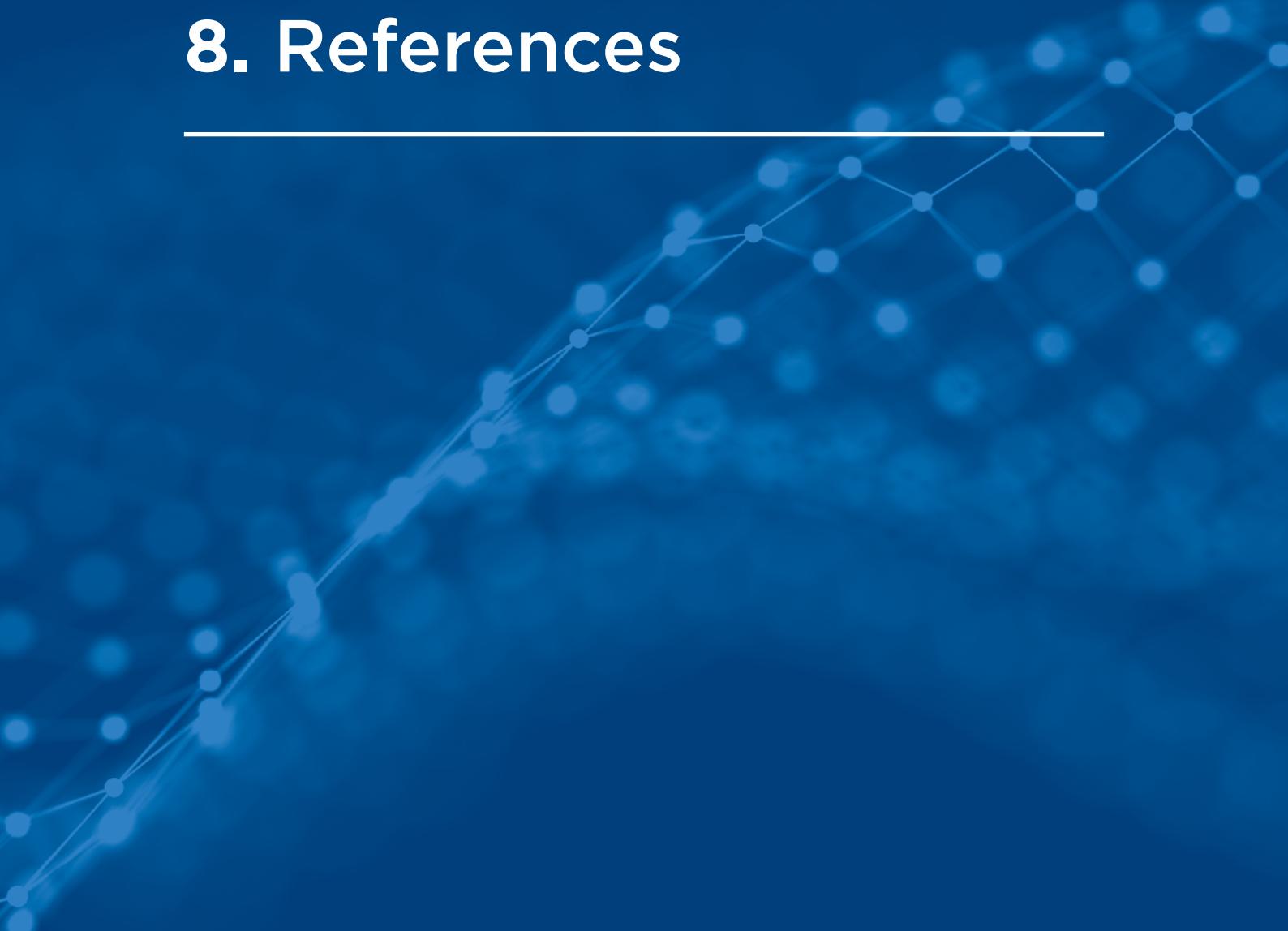
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9. MEDIPOS organization

9. MEIDPOS organization

1. Team

Bohyun Park

CEO (Chief Executive Officer)
CEO, BNH Korea
M.A., Journalism and Mass Communication, Yonsei University

Sang Jae Seo

COO (Chief Operating Officer)
CEO, PAYX
Former COO, PAYGATE Korea
Fin Tech expert

Jaewon Lee

CMO (Chief Marketing Officer)
Former Corporate Affairs Director, Reckitt Benckiser
Former Country Head of Corporate Communications, Bayer Korea Ltd and
Head of PR/Communication of Bayer Healthcare in Korea
Diploma, Public Health, Seoul National University

Sungwook Choi

CTO (Chief Technology Officer)
Head of Center, Suresoft
Former CEO, TOBECOMZ
Former Executive Director, EchoCloud
B.S., Telecommunication, Ohio University

Yongsik Kim

CSO (Chief Strategy Officer)
CEO, INNO Healthcare
Former Director, Ernst & Young Advisory
Former Principal Specialist, Samsung SDS
M.S., Electrical Engineering, University of Missouri

1. Team

YoungWoo Pae

AI Architect
CEO, MediRita, Inc.
Former IBM Executive, Client Technical Advisor for Watson
B.S. & MBA, Korea University.
Ph.D., IT Policy and Management, Soongsil University

Seung-Hyun Jin

System architect
CSO, MediRita, Inc.
Former Assistant Professor, Seoul National University Hospital
Former Research Fellow, NINDS at NIH
Ph.D., Physics, KAIST

Taehee Park

CCO (Chief Creative Officer)
CEO, PENTABREED
Former Head, Korea Digital Enterprise Association
B.S., School of Design, Hongik university
M.A., Journalism and Mass Communication, Yonsei University

Gina Oh

Public Relations
Senior Director, Risk Management Team, Amorepacific
Former Staff, AhnLab and Daewoo Electronics
Diploma, School of Business Administration, Chung-Ang University

Wooseong Choi

Engineer
CEO, MOUSEDOTCOM
Former Manager, Joongangilbo Healthmedia Beauty-Messenger Campaign
Former Manager, KT-080114 Platform
Former Manager, Korea Foreign Company Association under the Ministry of Commerce Industry and Energy

2. Advisory board

- Medicine

Changil Park

Honorary Director, Myongji Choonhey Hospital
Former Director, Konyang University Hospital
Former President & CEO, Yonsei University Health System
Former Chairman of the board, Korean Academy of Rehabilitation Medicine

Myung Chul Yoo

Emeritus Professor, College of Medicine, Kyung Hee University
Emeritus Chair, Suncheon Foundation Chung Hospital
Chairman of the board, Korea Public Tissue Bank
Former President, Kyung Hee University Medical Center
Former President, Kyung Hee University Hospital at Gangdong

Hee-Won Jung

Emeritus Professor, College of Medicine, Seoul National University
Former President & CEO, Seoul National University Hospital
Former President & CEO, Seoul National University Boramae Medical Center
Former President, World Congress of Neurosurgery

Sung Hoon Noh

President, Yonsei Cancer Hospital, Severance Hospital
Former Chairman of the board, Korean Cancer Association
Former Chairman of the board, The Korean Gastric Cancer Association
Former Chairman of the department, College of Medicine, Yonsei University

Han-Kwang Yang

Director, Gastric Cancer Center, Seoul National University Hospital
Professor, Department of Surgery and Cancer Research Institute,
Seoul National University College of Medicine
Ph.D., Seoul National University College of Medicine Surgery

Kyung-suck Koh

Professor, Plastic Surgery, ASAN Medical Center
Ph.D., Graduate School of Medicine, Seoul National University

2. Advisory board

- Business development

Jaeseung Jeong



Professor, Department of Bio and Brain Engineering, KAIST
Former Assistant Professor, Department of Psychiatry, Columbia University,
College of Physicians and Surgeons
Former Research Associate, Department of Child Psychiatry,
Yale University School of Medicine
Ph. D, Physics, KAIST

Sang Moo Lee



CEO, Danal SSOCIO
Former Visiting Professor, Columbia Business School, Columbia University
Former Administrative Officer, Ministry of Information and Communication
M.A., Seoul National University Business School

Gyeongae Park



CEO, CreSoty
Former CEO, MEDILINKS
2002 Korea e-Commerce Awardee (merit award)
B.S., Mathematics, Ewha Womans University

3. Token payment partners





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