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1. MEDIKEY Overview

1.1. What is MEDIKEY?

MEDIKEY is a blockchain-based health/life information platform that can collect and utilize health information, life pattern information, and medical information distributed and managed by various different organizations produced through various smart devices.

- To support the collection and utilization of health status information, life pattern information, and medical information through voluntary generation and provision of information by users
- Personal health status information, life pattern information, and medical information are securely encrypted and stored on the blockchain without identification
- The results of research and data are collected anonymously and information necessary for data collection or research are provided
- The suitability of the subjects and the integrity of the data provided are verified based on the unmodifiable RAW data recorded on the blockchain. The data collector cannot access to the identity of the data provider or other raw data but receives the result what he/she needs to know.
- To provide reasonable compensation for the valuable data contributing to the improvement of human health
1. MEDIKEY Overview

1.2. Project Background

- **Production and Utilization of Personal Health Status and Life Pattern Information**
  More than 52% of smartphone users have already used health information and lifestyle information through their smartphones. As a matter of fact, smartphone users can check such information at any time because almost every smartphone launched since 2017 automatically stores health information and lifestyle information on the phone, even if users have not used such information. In other words, almost all smartphone users are already producers and managers of their health status and life pattern information, and we need to provide safer and more effective management tools.

  Health status information and life pattern information are widely produced and stored intentionally or automatically in mobile apps and various wearable devices. However, there are very few cases that collect, analyze or use this as valuable information. Institutions and individuals are still getting and analyzing health information and life patterns information separately through their private networks or traditional research methods.

- **Status of Medical Information Utilization**
  Personal medical information is classified as extremely sensitive personal information in most countries and privacy of information is the biggest issue in the data management field because the national regulations are very strict in this field for recording and archiving the information.

  It is difficult to organize and connect all medical information as most of the medical information is distributed and managed by the institution that produced such information. In the case of small private hospitals or clinics that cannot systematically manage the information protection system because of the financial problems, it is difficult to comply with the regulations. Most medical information is shared only through information producers and small-scale related organizations. The confidentiality and the integrity of the data may be compromised because the management process is performed in the closed environment. It is also not easy to identify and discard the medical information after the storage period has expired.

- **Growth of the Digital Health Status Information and Life Pattern Information Related Market**
  Digital health information and life pattern information market, which is expected to grow to more than $2,333 by 2020, is mainly active in fitness, exercise, sleeping, meditation, diet, smoking and drinking management, medication application as of 2018. The related information is managed by individual business units that provide the service and it is necessary to integrate and expand the service for analysis and management.
2. Technical Configuration of MEDIKEY

2.1. Key Management Method

The core of MEDIKEY ECO SYSTEM is the key management.

Users can generate multiple disposable temporary key OEK (Onetime Encryption Key) and ODK (Onetime Decryption Key) based on the master SEED KEY that can access all information.

In principle, the key can be issued repeatedly close to infinity. Although an automated data logging app may record data at a frequency that is close to infinite and exhaust all of the keys, there is very little likelihood of this problem because user app provides the second and third master SEED KEYS.

The advantage of OEK method data recording is that even if the corresponding key is disclosed, the unauthorized occupier of the key cannot record the wrong data using the key. The newly recorded data using the corresponding key will not be utilized because it will be verified as erroneous data when it is utilized with the key which has already been used. In addition, it is basically impossible for the key occupier to search data of the user or trace the user information with the key.

ODK–based data retrieval is related to OEK data recording. Since data is recorded by OEK method basically, no data other than the provided data can be retrieved by the ODK provided for inquiry. Naturally, it is impossible for him to inquire or collect additional data using the same key.
2. Technical Configuration of MEDIKEY

2.2. Data Management Method

**Data Utilization Process (standard)**

<table>
<thead>
<tr>
<th>Institution</th>
<th>MEDIKEY</th>
<th>User</th>
</tr>
</thead>
</table>

**STEP1**
Institution APP – Review Request
1. To define targets
2. To define information to be collected
3. To enter phrases explaining the research
4. To generate Master Seed Key for the Research
5. To generate OKE(One-time Encryption KEY)

**STEP2**
MEDIKEY Portal – User Searching and Matching
1. To publicly post the review result on the PORTAL DB
2. To search participants
3. To send push alarms to potential participants
4. Users will approve the participation

**STEP3**
User APP (Mobile) – It checks the eligibility and provides data for collection
1. When a user clicks Approval Trial button, it verifies his/her eligibility using the data stored in the blockchain with the SEED KEY of the corresponding user (it is stored in his/her user APP) and collects data.
2. The user checks if he/she is eligible for the research and approves the data provision
3. It encrypts data using OKE(One-time Encryption KEY) provided by Institution and records in the blockchain or delivers the record to the Institution through MEDIKEY PORTAL

- The method to provide the ability to collect and provide data automatically without user intervention for user’s convenience is under review

Exercise record, medication administration record and life pattern as well as personal medical information and health status are sensitive personal information. In particular, some countries (ex. EU) strictly regulate to protect sensitive data. The data recorded on the blockchain’s digital record cannot be changed. It is stored permanently without alteration. In general, data recorded in this manner will be publicly accessible.

MEDIKEY encrypts and stores those data anonymously so that sensitive personal information, health information, and medical information cannot be accessed by an unspecifed number of people. The individual cannot be identified with the data written on the blockchain. The data recorder can identify and prove his/her information by collecting the data that he/she recorded, but nobody can trace the individual through the data particles reversely.
2. Technical Configuration of MEDIKEY

2.2. Data Management Method

When a medical institution or research institute requires data for information analysis, minimum data that should be provided for the analysis will be collected and processed. It is recorded on the new blockchain as the information for submission and it certifies that the information for the submission, it is identical to the original data.

In the new data for submission does not have identification information but the medical institution or information analysis institute that received the collected data can notify the data provider through the separate data provision identification code. The identification code is one time use and it cannot be reused.

The minimal information that should be provided does not mean the detailed information such as exercise record and medication administration status. In most cases, it includes statistical information such as the ratio of goal achievement, times and frequency. The followings are the examples.

- Exercise information related: Total achievement ratio by period /times /frequency /time, Rate of the designated exercise /times
- Medication Information: Medication compliance rate per period
- Treatment/Visit information: Treatment /Visit times
2. Technical Configuration of MEDIKEY

2.3. User Data Recording Method

User Health Information, Life Pattern Information and Medical Information Writing Method
(It can be used by General Users and Medical Institutions together)

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Health status information, life pattern information, and medical information of all users are recorded through OEK generated based on the user’s Master SEED key. It is possible to prevent unauthorized use such as manipulating or utilizing somebody else’s data by stealing the key, as it needs different encrypted key every time. It can help identify data owner by back tracing or collecting other data of a certain user without authorization.
2. Technical Configuration of MEDIKEY

2.4. Research Distribution/Participation

Research Distribution Method

- Theoretically, OEK can be created infinitely and distributed to unspecified individuals. But they will be created with writing and reading functions only.
- It will take near infinite time to trace SEED KEY through OEK.

Users can perform various activities through the MEDIKEY management app. They can provide information to the hospital or medical institution when they need as well as they can actively contribute to a variety of research activities.

When statistical analysis of users with a certain lifestyle is needed, the organization that wants to perform the statistical analysis shall define the target user group, generate the master encoding key for the research and the generate a disposable key value for data provision using the master encoding key.

Information for the new research will be posted on the MEDIKEY platform provided for statistical analysis and research, and the publicly posted research will be distributed through MEDIKEY user app.
2. Technical Configuration of MEDIKEY

2.4. Research Distribution/Participation

Users will automatically check the list of relevant research at set intervals such as hour/day/week/month through user app. After verifying if the data generated through master key value fall under the research subjects, it asks the user if he/she wants to participate in the research.

When the user approves the provision of data by participating in the research MEDIKEY user app will provide the user’s data after encoding them with the disposable key value which was provided by the research institute. The encrypted data can be read only through the master key value of the institute. The key for recording can be used for recording only. It cannot be used for reading data.
2. Technical Configuration of MEDIKEY

2.5. MEDIKEY Basic Service

- **POX (Proof Of eXperience)**

It means users’ health experience. It records and shares Medical Health Story & Information through MEDIKEY PORTAL (Regular Research of MEDIKEY Portal). Organizations that need statistical analysis and research can search and select the target group, through basic contents of MEDIKEY blockchain and POX that proves that the participant is a member of the Medical Story & Information ecosystem of the MEDIKEY blockchain and research participants can prove that they are legitimate research participants through POX.
2. Technical Configuration of MEDIKEY

2.5. MEDIKEY Basic Service

- **POM (Proof Of Mission)**

It means health mission achievement information. It records and shares Medical Health Story & Information through MEDIKEY PORTAL (Regular Research of MEDIKEY Portal). Organizations that need statistical analysis and research can search and select the target group, through basic contents of MEDIKEY blockchain and POM that proves that the participant is a member of the Medical Story & Information ecosystem of the MEDIKEY blockchain and research participants can prove that they are legitimate research participants through POM.

- **POX and POM are referred to as the basic contents required to maintain the MEDIKEY ecosystem in this white paper and we are planning to provide other related services, too.**
3. MEDIKEY Framework

- MEDIKEY is the Medical Story & Information Platform that supports users to collect and utilize health status information, life pattern information and medical information that users generate and voluntarily provide.

- MEDIKEY Medical Story & Information Platform aims to lead the 4th industrial revolution by organically connecting with AI, IoT and Bigdata to prove the usefulness of the collected information and contributing to improvement of human health.

- To this end, we will provide MEDIKEY blockchain based information management Framework ‘MEDIKEY Framework’ so that data can be recorded and utilized safely and efficiently.

- ‘MEDIKEY Framework’ is designed to respond to the situation and related laws and regulations of the country.

- We will provide MEDIKEY API with which third party services can be made by interoperating with MEDIKEY Platform and ‘MEDIKEY PORTAL’ where the researchers can register their research, check completed/ongoing research list and basic statistical data gathered from user information data, and ‘MEDIKEY User App’ where MEDIKEY Platform Users can easily record and manage their health status, life pattern and medical information.

- We are planning to provide existing related service providing companies or those that want to newly provide such services with development tools with which MEDIKEY blockchain based distributed application (DAPP) is made.
3. MEDIKEY Framework

Development tools that the general enterprise/organization can quickly apply MEDIKEY-based DAPP to existing business processes.

Users can easily record and manage their health status, life patterns, medical information, and manage MEDIKEY COIN assets.

A Distributed Applications that can manage MEDIKEY based health management, life management, and medical information.

To register users’ health status, life patterns, medical information related researches and to check completed/on-going research list.

![Diagram of MEDIKEY framework](image-url)
4. Advisory Organization

**MEDIKEY Information Alliance**
Third party service company/organization union using information provided by MEDIKEY

**MEDIKEY Foundation Institute**
Institution to execute fund raised through MEDIKEY

**WPOW Alliance**
It is a cryptocurrency mining union driven by USA, Spain, Korea and Thailand. It provides Hash Power to MEDIKEY

**MEDIKEY Project Team**
Development team that provides MEDIKEY development and fork plan
5. MEDIKEY Major Roadmap

ICO
- Early Backer
- Private Sale
- Pre Sale
- Main Sale
- Token / Coin
- Test NET
- Main NET

COIN
- Story DAPP
- B.C GYM
- B.C Hospital

POC
- Proof of Useful
- Proof of Value
- Exchange Market

IPO

MEDIKEY Story DAPP
MEDIKEY B.C GYM
MEDIKEY B.C Hospital
6. Token Economy
6.1. Basic Issuance Information

a. Coin Project Name: MEDIKEY
b. Coin Abbreviation: MKEY
c. Total Supply: 3,000,000,000 MKEY
d. Coin Logo

MEDIKEY
6. Token Economy
6.2. Issuance Method

10% of Pre-issuance
90% of issuance will be made through Mining
To issue through WPOW (World Proof Of Work)

MEDIKEY refrains from pre-issuance for the purpose of fund raising for development fund and compensation of Development/Advisory organization before project initiation. It will minimize the issuance to the amount required for the expansion of MEDIKEY. All the issued coins will not be distributed without based assets. They will be distributed according to the size of back-up through physical assets or other digital assets through the unlocking process.
6. Token Economy

6.3. Operational Method: WPOW (World Proof Of Work)

- MEDIKEY is managed through the WPOW (World Proof Of Work) method for the participation of users regardless of national boundaries, and for the effective management of health status information, life pattern information, and medical information.

- WPOW (World Proof Of Work) means that the mining scale is allocated according to the scale of the participants and information volume of the country where MEDIKEY is used. In the countries where MEDIKEY is distributed, it can be used for the distribution of the legal health status information, life pattern information, and medical information.

- It is also a method that can be supplemented responding to administrative and legal regulations so that it can comply with the administrative procedures and the laws of the relevant countries.

- To comply with the regulations on stable real-asset interoperation and inter-country asset transactions of the countries which adopt MEDIKEY, KCMA (Korea Coin Mining Alliance), which reserves the highest Hash POW, ECMA (European Coin Mining Alliance) located in Torrejon, Spain, MSCG located in Las Vegas, Nevada, USA and UIVISTA TAI located in Bangkok, Thailand have already participated in the mining related network and other organizations in China, Japan, Vietnam and Malaysia are preparing to participate in WPOW.

MEDIKEY WPOW
7. TEAM MEMBER

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7. TEAM MEMBER

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**Masazumi Akazawa**
- Graduated from California State University of Los Angeles
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- The chairman of the board of Blockchain Developers Association
- Researcher of Agriculture and Technology of University of Tokyo, Research Institute
8. Partners

HIVE CENTER

THE FORCE LAB

SONGHO COLLEGE

SILVIYA

HUA YAN GROUP CORPORATION

METACITY

清音

LAW FIRM CHEONGEUM

TOKYOMINT

INTERNATIONAL REALTY GROUP

TOBESOFT

ORANGE SECURITY

STYLELINK
9. Legal Considerations

This white paper is intended to give information to those interested in MEDIKEY Blockchain and the MEDIKEY Framework for their reference. Therefore, this white paper is not soliciting investment in MEDIKEY. The technical and legal content described in this white paper may change at any time, depending on the decision of the development process, and the content of the white paper is the plan at the time of publication. If you make a decision or take an action despite the notice, it means that you fully understand this and make decision on your own.

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※ This White Paper is written on April 12, 2019 as Version 1.2.
THANK YOU