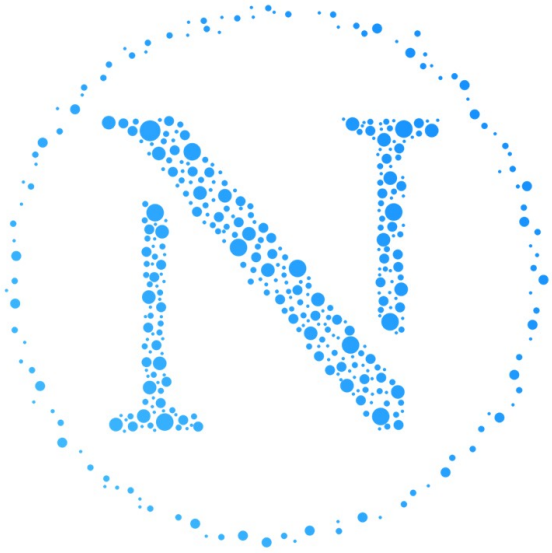
NAM White Paper ver. 1.0.7

July, 30 2018



NAM COIN

Revolution in medical care with AI and Blockchain

NAM Inc.

""*Remember,*
money and health
will be with you, always"
—— CEO of NAM Teppei Nakano

Index

We will explain the purpose of coin issued, and details of the project; in the end, how to sale. Considering ICO related to the professional field, that is the field of medical care, we will particularly explain the details of the project, because we would like investors to understand things in the field of medical care.

Updated Information

#ver 1.04

Deleted the price per 1NAM. Please take a look at our website.

#ver 1.05 & 1.06

Changed Hard cap as 2 million USD.

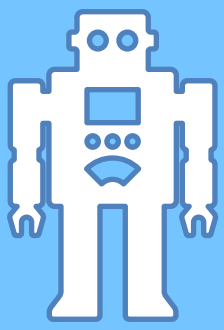
Information on the second sale

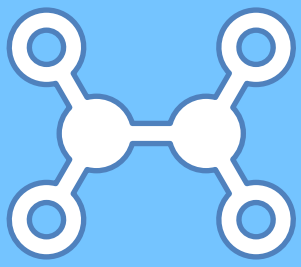
Update the roadmap

#ver 1.07

Information on the burn of NAM Token one 2018.07.26 in Chapter 6.

Summary





AI

Blockchain

NAM

Revolution in medical care
in Japan

Outline of Project

The NAM project is a project to combine artificial intelligence (AI) and block chain technology to bring about innovation in the Japanese medical system. There are three problems in the current medical treatment.

1. The point that doctors can not grasp the patient's improvement by their treatment
2. The penetration rate of electronic medical charts in Japan is limited to 50%
3. The treatment that can be received in insurance treatment in Japan is delayed 4 years from the world

NAM will solve these problems using AI and block chains. In particular,

1. By using AI, the doctor fully grasps the progress of the patient
2. Create a safe electronic medical record system at low cost using block chains
3. NAM's AI Clinic Offering the World's Most Advanced Treatment and Inspection

We will bring about the innovation in the system of medical care combining Artificial Intelligence (AI) and Blockchain technology. In the modern system of medical care, we will particularly reconsider sharing medical records of patients and the cycle structure of medical charges, and try to solve the problem with Blockchain, cryptocurrency technology and AI.

The project of our company is based on what the representative of NAM, Teppei Nakano developed in the ‘business unexplored’ of IPA under METI in 2016. The system, titled “The development of search system of electronic medical records to save medical care in Japan” is the infrastructure of sharing medical records, medical care in remote areas, cooperation among doctors, introduction of cutting-edge AI model and so on, so it may largely contribute to next-generation medical care.

To expand the software of medical care made in our company as a platform in such a way, enormous costs to develop and introduce are needed, including cooperation among hospitals, servers-reinforcement, employment of labors.

We will not charge users these costs needed for introduction. That is because rich people can only use these services, but non-rich people cannot use or gain these services. To install and use the system for everyone equally, we are planning to finance via ICO and make it

popular due to the 0 system fee. The value of human beings is equal at all, so medical care should be services offered to all.

In addition, our company will not only offer IT services in medical care, but also start medical corporation, 'NAM AI Clinic' in April in 2018. In this way, we will spread our AI resources over our clinics. It is the spread that NAM Inc. can make, which has a medical corporation.

Our services begin from consultation using AI to sharing medical records between doctors and patients, examination services by our original AI, and appropriate treatments by AI. We have developed the system not merely for consulting but for managing patients' health considering their lifestyle, AI's cooperating with hospitals. We are going to cut costs efficiently by using the virtual currency in settling between medical institutions and remitting.

As another way to use the currency, it can offer the transaction platform of the currency prepared for crowd funding relating to health care and so on; in turn, it could make it easier for people in the field of medical care to finance.

Development of currency and the purpose of finance in ICO

The funding is expected to use to develop the fundamental projects in NAM at all.

1. Development of AI services for medical industry and Running costs

A. Consulting bot using AI

The service to teach us how urgent a symptom is and so on by inputting the symptom to the app.

B. Diseases Prediction Model with machine learning

Diseases prediction with cutting-edge AI, still not offered to hospitals like 'the probability to become diabetes in two years' by results such as a blood test

C. Healthy food recommended by AI

The service that NAM App. offers healthy food adjusting to users' lifestyle or their constitutions

D. Next-generation system of medical records with deep learning and Blockchain

The service that efficiently offers medical records to hospitals

E. Starting up NAM AI Clinic that can offer services including A~D

The medical corporation, NAM AI clinic where people can directly accept medical AI services offered by our company

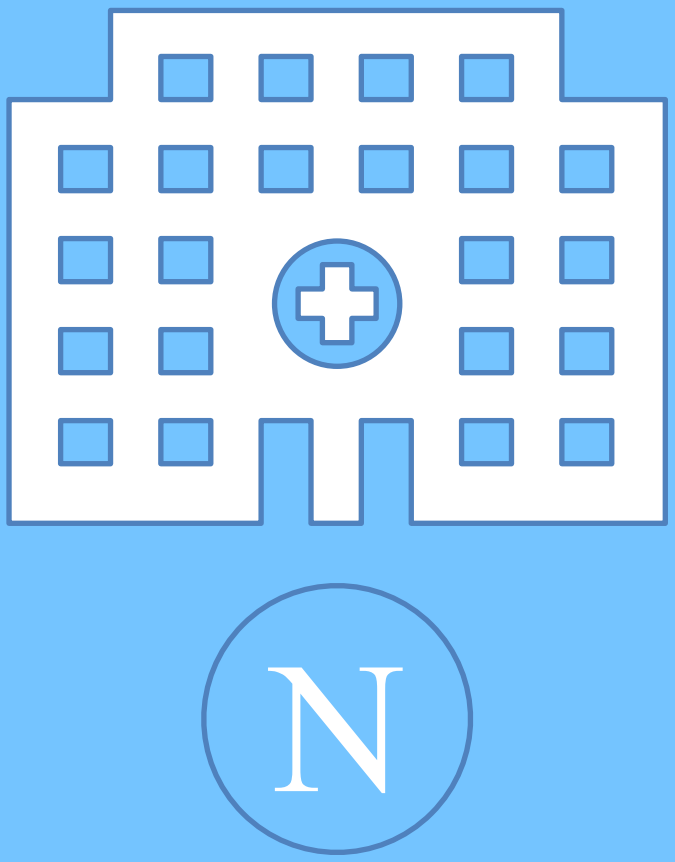
As one story, in the first place, we spread the consulting bot with AI and lead people to a hospital before they get serious diseases. Connecting the hospital with the patients, AI bot enables them to manage their information relating to medical care. They have a medical examination with the cutting-edge diseases prediction by our AI, are offered appropriate treatments and healthy food, and keep health. If this series is expanded nationally and globally, we can spread the next-generation medical records considered by our company. This series will decrease medical fees in Japan, and improve the working environment of doctors. Moreover, our system of electronic medical records will cause the big change in what medical information is today. With Blockchain, it can offer innovative efficiency in the settling system of insurance points in medical care based on fees in hospitals and purchasing cost of medicines.

It may be difficult for other medical institutions to introduce with such an innovative and medical care AI services for the first. However, we will run the medical corporation, NAM AI Clinic by ourselves, so it is possible to expand medical services as soon as possible.

2. As the currency of platform for new businesses concerning about medical care

As mentioned above, it can offer the transaction platform of the currency prepared for crowd funding relating to health care; in turn, it could make it easier for people in the field of medical care to finance.

1. About Coin



1. Outline of Coin

What is Cryptocurrency

A cryptocurrency is a distributed currency, represented by Bitcoin. Bitcoin was started to use in 2009, based on the thesis published by Satoshi Nakamoto.

The industry has been growing drastically since Bitcoin began for eight years where various communities emerge and projects start day by day. With rapider growth, it is becoming popular for many people today.

Ethereum is the second largest cryptocurrency in the market total values, and our company collects it in ICO. That is because it is good for the function of platform to make applications. Ethereum can fill particular data in Ethereum block, not like that Bitcoin can only fill transactions data in Blockchain. In this background, Ethereum is focused on by famous and large companies such as Microsoft, JP Morgan, TOYOTA, and MUFG.

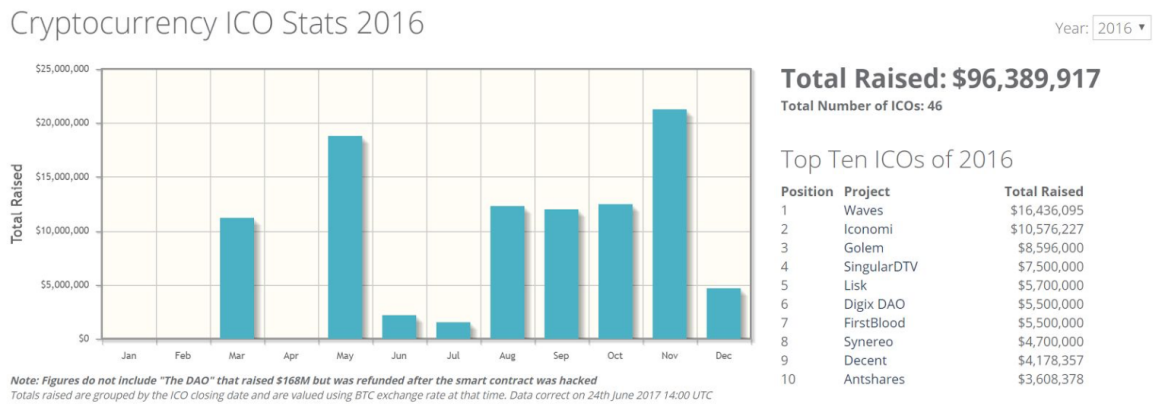
Information about cryptocurrencies is broadcast day by day and various information is exchanged in Japan where many media start to broadcast them. In 2017, most people today start to know the word ‘virtual currency’ such as Bitcoin without details. However, there are big differentials in information compared to that in other countries. It has to be said that large delay exists compared to the US regarded as ‘the developed country in financial literacy education’ or China. By regulation in China, it is true that many amounts of transactions in Bitcoin account for exchanges in Japan, but this is only because Japanese investors have a lot of capitals and close it up in terms of an investment tool. In fact, relating to the project that uses Blockchain and cryptocurrencies technology properly, it has to be said that they are still developing.

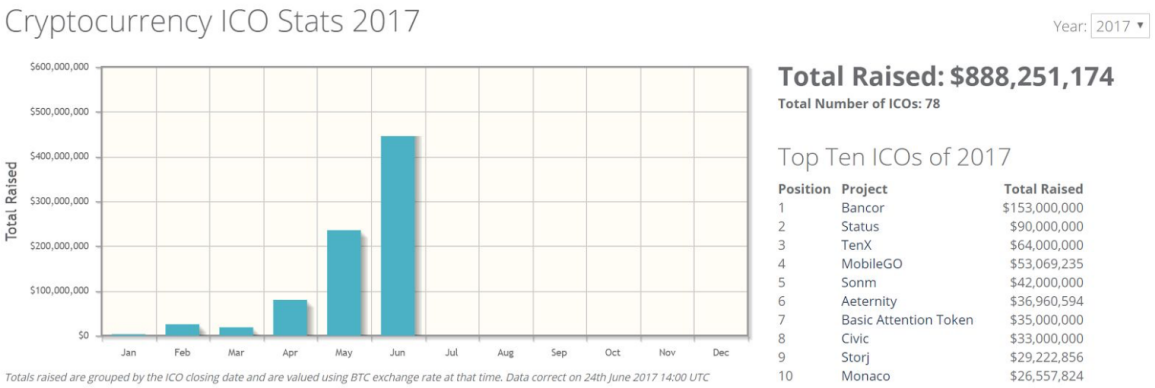
Especially, in the US, China, and the neighbor South Korea, the series that successes in businesses using ICO becomes major, like that it is overwhelming finances by VC or IPO. This is not only because cryptocurrency technology, which is not restricted by how to finance in a traditional way, has an affinity with finance, but largely because ICO, which has few entry barriers, makes it possible to finance even for innovative services that could not finance in an old way at all.

There are somewhat demerits in ICO, though. It is possible to do without surveillance, so there are also many cases where projects without necessity finance too much. Even considering such a demerit, ICO by cryptocurrency is an innovative finance. Though other countries regulate it, it is the hottest finance.

Expansion of the market scale in ICO

Monthly market scale and the ranking of funding in ICO





Source: https://www.coinschedule.com/stats.php

ICO in Japan

Although Japanese start many projects of ICO, the market of cryptocurrencies is still premature in Japan. Compared to other countries, ICO is not ordinary. Indeed, higher ranks of funding in ICO are almost abroad projects, so investors in Japan still invest projects abroad in the structure.

As in the second half in 2017 some big ICO are held in Japan, finance by ICO will be held as a major method of finance also in Japan afterwards.

This project, as an ICO from Japan, will not solely lead the industry of cryptocurrencies in Japan, but create large innovation toward the world.

ICO is the method to create innovation made by Blockchain technology. While some countries regulate ICO, NAM do the clearest, safest and innovative ICO in the world to save ICO. We establish the successful role model in Japan.

——— NAM ———

Currency issued in Project: NAM (NAKANO AI MEDICAL)

As the stage of kick-off, we will use the Ethereum technology and issue token. NAM coin is based on Ethereum network and Blockchain. It is based on the consensus structure called Proof-of-Steak (POS). POS is the structure giving the new virtual currency issued, being proportion simply not to the amounts of helping to examine transactions (the amounts calculating by PC), but to the amounts of having the virtual currency. That is why it is less consuming electricity and more eco-friendly than PoW of Bitcoin, so it is main-stream.

This token using Ethereum is the system in the first stage to finance; afterwards, we will transfer the token of original private Blockchain. Our private Blockchain is under research now, and the epoch-making system with machine learning and Blockchain, as described below.

Original Private Blockchain Implementation

The scale problem of cryptocurrency

For example, Bitcoin is limited to the amounts of transactions data filled in blocks. Therefore, there is the problem that the same time many people remit, it becomes crowded, and fees get more expensive.

However, once considering, it is not always necessary to write on Blockchain to transfer values. For instance, transfer of values is secured if remittance is locked by time and 'settled by writing on Blockchain anytime'.

The typical research published in 2011 is the method, payment channel. It is the idea that members to have the address of Bitcoin make a group to remove the remitting fees by making transactions in remitting in the group without writing on Blockchain.

However, this method needs 'absolute confidence to the manager of the group', so this is not the perfect idea of Bitcoin but a compromise considering practices. This method, which transfers values without writing on blocks, is called off-chain.

Toward Lightning Network

Lightning Network is the network where any person can entry without a central institution and is the off-chain remitting method. This approach composes the collection of many payment channels. Lightning Network develops as the big remitting platform as VISA, and is largely expected because of the experiment to use 2,500 nodes.

This algorithm aims at discovering routes sooner. This is achieved by each node's collecting the information of topology in Lightning Network positively. The information collected here includes not only payment channel to node similar to number of hops in address space, but also the route to beacon node. It simulated route-algorithm, and discovered scaling 100,000 nodes at least.

To sum up, that is novel to collect information positively by beacon while that stores the necessary information for routing.

As another merit to receive fees, it adopts the idea that it has made payment channel and it has been chosen as a route. As a result, it can increase the available amounts of transfer in the whole network.

Research at NAM Inc. and Private Blockchain

As we introduce and praise Lightning Network, you may think it is perfectly wonderful. However, even Lightning Network has a big difficulty, relating to privacy. In Lightning Network, when a node transfer information to each other, it clears the information 'how much anyone has'. If it is transferred to a malicious node, it clears how many amounts of coin a specific user has. You may think that it is not so big a problem that the amounts are known, but this is a large problem in the industry of medical care.

Our company does not use Lightning Network, so such a problem is not caused. However, consider the case where people want to speed up in remittance. If it is clear 'how much NAM coin patients buy and use', it is possible to assume a healthy state of them, since they accept medical services usually

Our company aims at 'safe and speedy algorithm in transactions' with private Blockchain in the direction of researches. We will cite the research contents of our CEO Nakano as described below.

Original Blockchain of NAM achieves highly anonymous and distributed network, due to relating to health care

——— NAM ———-

NAM Blockchain: NAM Chain

First of all, "medical and block chains" is a story that everyone thinks, not the combination that NAM first suggested. The Ministry of Health and Human Affairs of the United States ministries and agencies conduct "contests widely asking ideas to solve medical problems in the block chain" in 2016. There, 15 outstanding ideas have been adopted out of over 70 proposals, and it is an interesting attempt given a prize of about 500,000 yen. However, it is a white paper at the level of the idea, and there are only white papers that are skeptical as to whether they are feasible and whether they are realized or used.

For example, briefly, there is a block chain proposed by MIT, the prestigious university in the world called MedRec. This stated that by saving the patient's treatment record in the block chain, it is possible to manage the medical information with low overall cost by preserving distributed unaltered distribution. Also, the miner is a medical researcher who can use anonymized data as a reward for mining, and use them to study them. But will it really be used? Studying that depends on mining seems to be unstable. In addition, medical information includes not only text but also image information such as X-ray and CT, but when managing image information in a block chain, it costs huge cost, and that point is touched at the MIT white paper at all It is not done. That is, the problem of the existing white paper, which proposes medicine and block chains, including the Challenge of the US Department of Health,

1. Incentives for mining, motivation is uncertain
2. The method of management of large data is unknown, cost estimate can not be made
3. Privacy is leaked in normal block chain system

On the other hand, our block chain technology, NAM Chain, can clearly solve the above problems.

1. Incentives for mining are NAM coins, and NAM coins can be used for all of our health clinic health checks, genome tests, health foods and so on.
2. Resolve storage problems by relating them to distributed file systems if data such as CT and MRI are large.
3. In the usual block chain system, we use machine learning with our proprietary technology which leaks privacy, speed up, complete a safe block chain

First of all, it is mostly done by Japanese people to receive medical examination once a year. Every year many people pay hundreds of thousands of yen, the demand for mining is high. As for the problem of data capacity, there is already a technology to associate the block chain and the distributed file system. There is a block chain called FileCoin, and our NAM chain is a similar idea. From this point, we will talk about a little professional things, but consider the goal of outline; we develop 'the technology to keep high security and to speed up'. We do not use Lightning Network, but develop the improved SilentWhispers, which still exsits. Although SilentWhispers secures privacy, its efficiency of remittance is bad, so we prepare a so-called Feature node in Blockchain network to improve it. This is the node to back Top-K shortest path distance from Sender to Receiver at any time. In this way, we can offer the most appropriate routing algorithm. This attempt to establish the node to offer the characteristic amounts of Sender and Receiver in distributed network, and to improve routing algorithm is the first time in the world. The original thesis is published by PDF below(Part of the Paper).
http://nam-inc.jp/images/tech_NAM_WhitePaper.pdf

About Routing

If you want to remit Mr. B from Mr. A, how do you search for the route from Mr. A to Mr. B? Finding the way is called routing. Routing has various methods and the most similar technology to our development is called Landmark Routing. This makes it easier to access by each node's showing what group it belongs to. In the example of Landmark, Mr. A remits to Mr. B living near Tokyo Tower, then this Tokyo Tower is Landmark.

However, Landmark Routing has some troubles, so we do not adopt it in NAM Blockchain. Instead, we adopt embedding-based routing algorithm. This algorithm only requires the minimum information for transfer, so it is difficult to grasp the whole structure of network from outside. That is, it is easy to constitute network for protecting privacy. To say

easily, embedding-based is the same as Landmark in assigning a mark as a node, but that is the number of the shortest distance.

About Token

We will open NAM token in ICO, and 60 billion NAM coin will become available. A NAM token's value rises, proportion to the price of the presale, in the end, we aim at 1 NAM=100 Yen.

NAM ecosystem is independent of each other as every segment (entity), regarded as a part of next-generation Blockchain Financial Statements. Users of the ecosystem can exchange the currency encrypted to each other. It becomes possible to exchange NAM currencies among individual wallets everywhere in the world. Users of expensive exchanging fees will have no longer necessity to search for the low price of foreign exchange.

By using the ecosystem, it becomes more convenient for users and business people to live. Settlement of consultation in hospitals or of medical fees of an interview by chat-bot. Foreigners can easily and efficiently use medical institutions without a complex method to pay medical fees for consultation. As mentioned below, management pressure of medical institutions as a medical problem will be solved by NAM coin and the examination of consulting fees by AI. We also aim at achieving the insurance card built in NAM wallet, and it enables all to accept easily proper consultation in hospitals and pharmacies. We will try to make the environment where proper consultation is offered as soon as possible without handing cash or worrying about expensive medical fees. It becomes possible to reduce costs of everyday and administrative tasks such as payment of bills in business, so it increases efficiency and reduces costs.

In such a way, medical institutions can try to benefit more in terms of management, so it is possible to construct better medical ecosystem even in terms of business.

2. About Project Team

2. About Project Team

The team specialized in medical care, AI, and Blockchain will try to develop the project.

Project Leader: Teppei Nakano

Education

June 2007: Graduated from Hyde Junior High School, San Jose, CA, US

Sept. 2007: Enrolled in Monta Vista High School, Cupertino, CA, US

Apr. 2008: Enrolled in Keio High School

Mar. 2011: Graduated from Keio High School

Apr. 2011: Enrolled in Dept. Medi. of Keio Univ.

Mar. 2017: Grad. from Dept. of Medicine of Keio University

Awards

2014: Sakaguchi Research Grant Award in Dept. medicine of Keio University

2015: A scholarship student by Satta Medical Scholarship Foundation

2015: Student Award in NIPS 2015 Workshop on Machine Learning supported by Google DeepMind

2015: A scholarship student by Pigeon Scholarship Foundation Inc.

2016: Sakaguchi Reseach Grant Award in Dept. Medi. of Keio Univ.

2016: Adopted by Scholarship for medical students in Fujinomiya, Shizuoka

2016: Certified as a creator in Project Unexplored by IPA under METI

2017: Adopted in Advanced Project Unexplored by IPA under METI (decline voluntarily)

Work Experience

July ~ Aug. 2012:

Intern as a researcher at NIH in the US

Aug. 2013 ~ July. 2014:

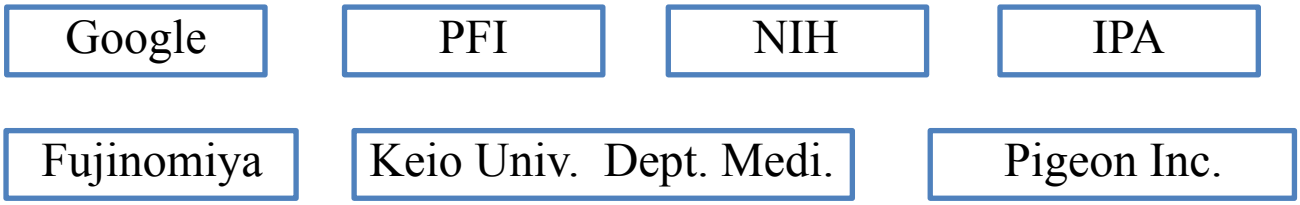
Intern/part-time job at Preferred Infrastructure Inc. (Preferred Networks today), the company of machine learning business

June 2016 ~ Mar. 2017:

Delegated by IPA under METI

Aug. 2017 ~ Sept. 2017:

Adopted in Advanced Project Unexplored by IPA under METI (decline voluntarily)



Development Team

Profile and the image of organization of development team

Open Member

Managers and their roles

Our company does aim not at making the overwhelming AI with technology, but enabling all to use in the frontline of medical care. Therefore, we examine the security of AI in terms of technology, medical care, and ethnicity.

Teppei Nakano

He graduated from Dept. Medi. of Keio Univ. dealt with the application of machine learning and medical care since his entry and published a lot of theses. manages engineering in this business.

Closed Members

Team is distributed to three teams. We develop by 15 members in total.

To make a team by proper members , depending on the progress of project and funding.

Medical Care Team (4 members)

To examine products developed by machine learning team in terms of medical care. Afterwards, to connect the frontline with AI such as what to do to install it in medical institutions

Machine Learning Team (5 members)

Certainly, it is necessary to increase accuracy of AI and machine learning. In addition, it is necessary to make speedy and practical system for the frontline. To examine such as how to collect data in terms of technology.

We will make two organizations: the closed team composed data scientists and soft engineers, and the development project by volunteers in open sources.

Security Team (3 members)

This is the most important part. The most thrilling case is like that hacked AI cannot find many patients of lung cancer. For preventing from that situation, it always observes and reinforces the security of system.

Blockchain Team (8 members)

Engineers described above include 8 members who are familiar with Blockchain, and they implement NAM coin this time. Afterwards, like thesis by Nakano, it tries to implement private Blockchain.

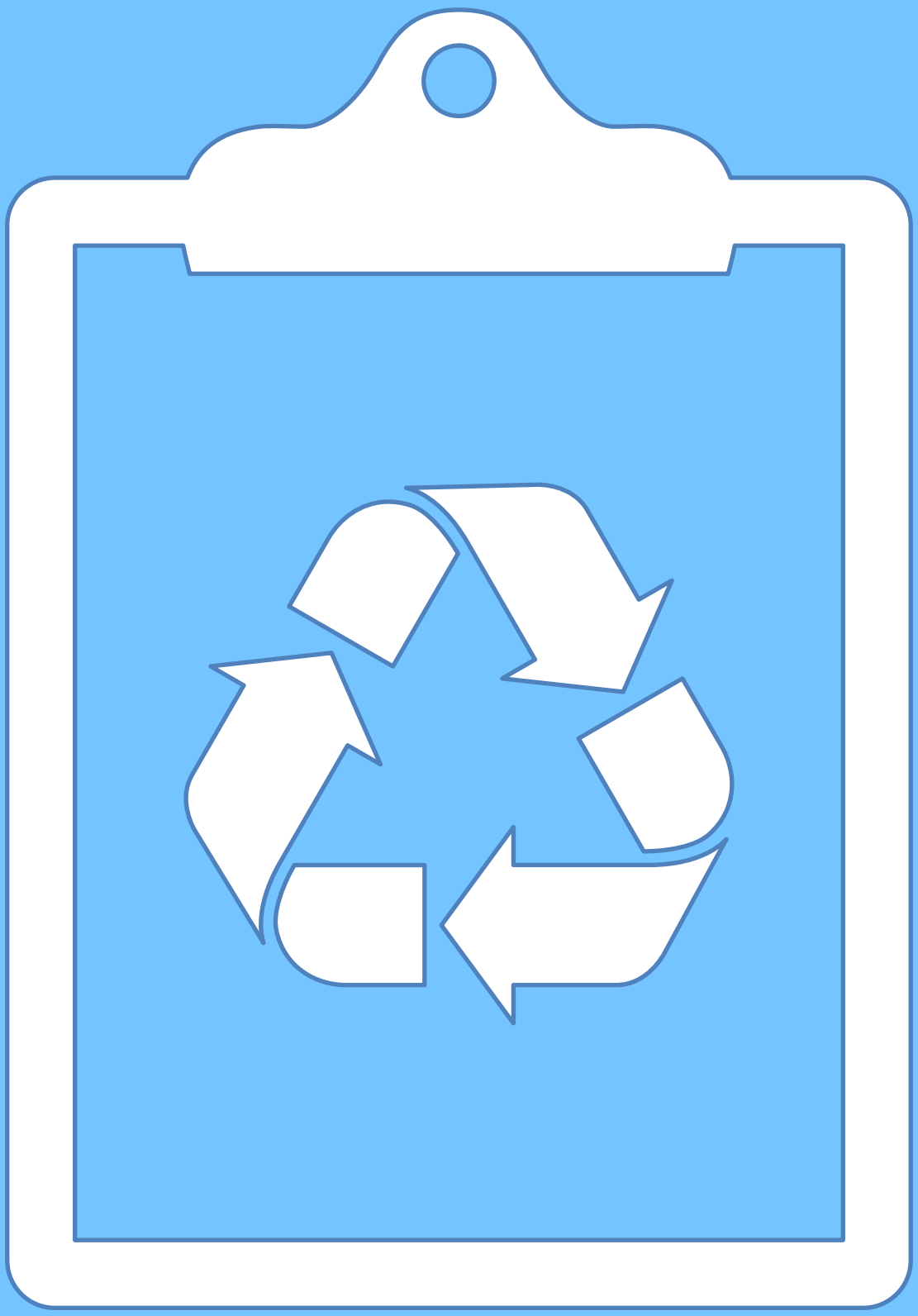
Marketing Team (3 members)

To decide the strategy of ads concerning presale of NAM coin. To support the project by branding and broadcasting information professionally.

Volunteers by open sources

In parts of conducting the project, we use open sources, and the part of product that should be developed by volunteers will be open in development.

3. Outline of Project



3. Outline of Project

Major research project in the project

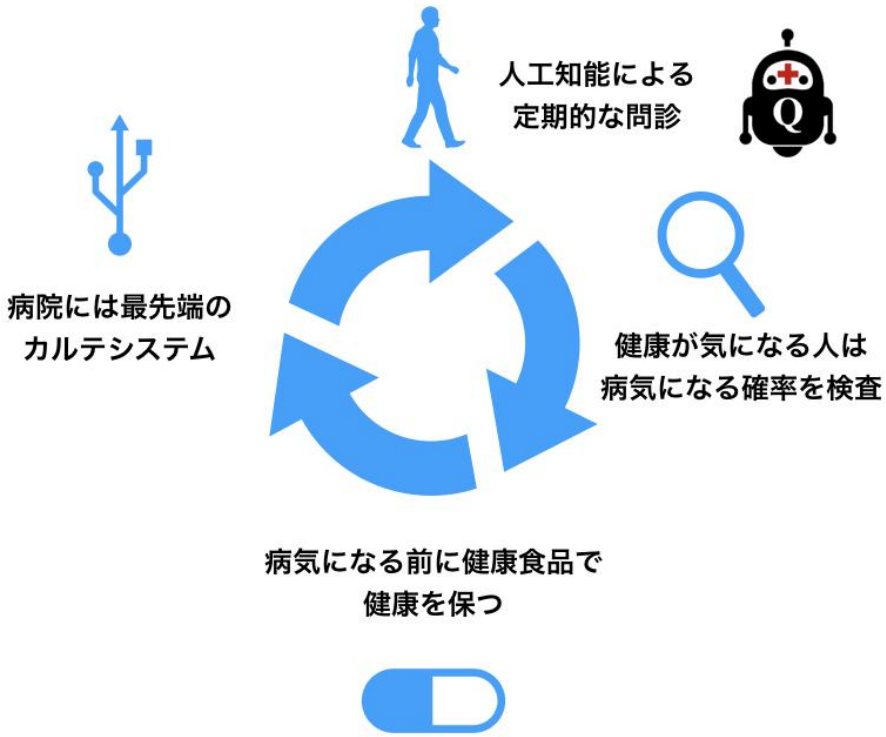
A. Consulting bot with AI

B. Diseases prediction model with machine learning

C. Healthy food recommended by AI using **NAM** coin

D. Next-generation medical records system with deep learning and Blockchain

E. Starting up **NAM** Clinic soon offering services including **A~D**



A, B, C, E of our services are for patients; D is for people in the field of medical care. Basically, buyers of NAM coin can receive services for customers by using NAM coin. They

can accept interview by AI with NAM coin; as a result, they can purchase appropriate medicines by NAM coin.

We do not do these projects not separately, but like drawing a big circle. As a blueprint, we discover diseases in the faster stage. We prevent from getting sick firstly. For this reason, we reduce tasks of doctors as much as possible to communicate between doctors and patients always and slowly.

Like medical care today needs hospitals, the next medical care needs NAM that expands services in the next generation.

——— NAM ———-

First, Prevention by AI

To prevent from getting a serious disease, the first to do is ‘people should go to hospital as soon as possible’. Although many modern people feel a symptom, they cannot go to hospital because they are busy. As a result, the disease get more serious, so when they feel sick, that is a big trouble. Not to be so, the software we have developed first of all is interview bot. This is made for patients like ‘whether they should go to hospital or they can cure by taking medicine’. Many interview bots or AI software try to categorize patients into niche diseases only known by doctors, but this is not made for patients. Our company develop services, getting close to patients. This is the first service.

Cutting-edge inspection for patients

Next, as the second service, we will expand how to examine with AI. There are many methods of inspections in medical care, but patients can receive the inspections that are approved by medical institutions in Japan. Our company will safely offer cutting-edge but still not-introduced to hospitals methods of inspections. For example, if we offer AI that predicts the probability to become diabetes from data, it can keep people from its symptoms before getting diabetes.

Healthy food recommended by AI to keep health

As the third product, medicine given at hospitals is basically ‘for treating patients’, so people cannot get medicine to keep health at hospitals. However, keeping health is very important not to get sick. However, to say frankly, normal consumers do not know what and how much medicine to buy and take. The service offered by our company grasps their constitution and lifestyle due to AI’s interview firstly. Considering that, it can select healthy food in each country and offer the most appropriate medicine or healthy food. These services are available with NAM coin

To make hospitals far more efficient

Finally, concerning the fourth service, there are too many wastes not relating to patients in medical care. It takes too long time to communicate or confirm information because many occupations that have different background work together such as a doctor, a nurse, a lab technician, labors for insurance or payment. We will show examples where it takes too much time:

1. To write down medical records
2. To arrange past information
3. To confirm insurance points
4. To examine consulting fees by the government

It is not exaggeration that it takes double working time for medical workers due to these tasks. We develop next-generation medical records to make it effective.

The scale of market and growth potential

The market of health care includes various industries such as that of medicine, medical equipment, nursing, healthy food, and its scale has been increasing year by year. According to the market trend survey of Fuji Chimera Research Institute (2015), Japanese market forecast relating to health care equipment in 2020 will be 165.9 billion yen increasing 55.2% compared to that of 2015; that of health care service and system will be 444.1 billion yen increasing 34.4%. According to the Japan Research Institute, in Japanese market forecast in

2020, the scale of market in medical examination will be 3.42 trillion yen, and that of healthy food will be 3.18 trillion yen. Our four services are mentioned below and we describe each growth potential of them. As mentioned above, we aim at making the stage of 'No NAM, No Medical Care' by 2020.

The global market in medical equipment including CT or MRI and so on is 30 trillion yen. The number one of sales in the world there is Johnson & Johnson (J&J) in the US of 28.7 billion dollar (about 3.43 trillion yen). J&J is the company indispensable to modern medical care already. If we take such a position, it is real that our sales are over 'a trillion yen'. Our company aims at taking the position like J&J in the field of AI in medical care by 2020.

Interview bot with AI

This service targets all healthy people. This AI is the entry for all people about to get sick, so the more popular this AI bot get, the more popular our other services can get. Therefore, we do not think that we can monetize only this AI bot. We aim at making this AI bot popular nationally in Japan.

When 10,000 people use this AI bot, 10,000 users have chance to accept services of our inspection and healthy food, so AI bot is important as an entry.

Prediction Model AI with machine learning

In an earlier stage, we will offer AI to teach users probabilities to become lifestyle diseases such as diabetes or high blood pressure. We estimate this sales of our inspection business at 10 billion yen by 2019 in the market scale of medical examination as 3.42 trillion yen.

Healthy food recommended by AI with NAM coin

There is still no system to recommend users healthy food with AI in the healthy food market, but our system makes it possible. We estimate the sales of our healthy food business at 10 billion yen by 2019 in the marlet scale of healthy food as 3.18 trillion yen.

Next-generation medical records system with deep learning and Blockchain

A research firm, Seed Planning estimates the market of electronic medical records at 256 billion yen in 2018 increasing 43.3 billion yen compared to that in 2015. The market of electronic medical records for hospitals is expected to become 259.4 billion yen in 2018 from

216.1 billion yen in 2015, softly increasing. Considering the introduction rate of electronic medical records as about 50% nationally, we estimate the sales of our medical records business at 20 billion yen.

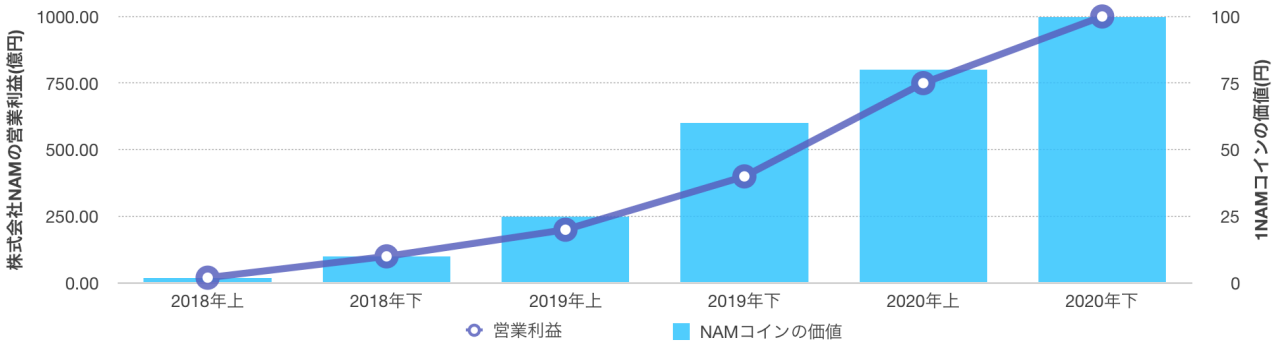
Starting up NAM AI Clinic

Our NAM AI Clinic will expand medical services using cutting-edge AI not covered by national health care. NAM AI Clinic is a group of medical corporations and we are planning to spread clinics with AI nationally in Japan. By 2020, we aims at making the group of medical corporations whose profit is about 50 billion yen.

Aim of NAM

Our services will be essential to medical care. By 2020, we aim at making the firm whose operating profit is 100 billion yen. As mentioned above, this is never impossible considering the scale of market and its growth potential. To achieve this number, our company will release innovative services anytime. We also simulate increase of values of NAM coin working together with our operating profit.

	営業利益	NAMコインの価値
2018年上	20.00	2
2018年下	100.00	10
2019年上	200.00	25
2019年下	400.00	60
2020年上	750.00	80
2020年下	1000.00	100



Interview bot with AI

Icon of interview bot: Doctor Q

LINE QR Code of Doctor Q

We continue to develop mainly the project by the project leader Teppei Nakano, considering spread and use actually.

We will sum up the project from thesis below. It is expected to apply to foreign patients by corresponding to languages as a use case.

In this project, we develop the electronic medical records with chat-bot to solve the problem in the frontline of modern medical care that ‘it is impossible to grasp progress of patients’. The character of this system is to collect and arrange automatically the information of patients that should be described on medical records, that doctors should follow and the consulting information that patients should take care of. It is possible to construct better medical environment to each other to communicate between doctors and patients via this system.

Background and Purpose

The largest problem now in medical care is that patients voluntarily have to convey their

progress to doctors to grasp the progress. Doctors properly consult and treat coming patients, but it is not simple to grasp the result. When the patient get better, he/she does not go to hospital to say thanks. When he/she has difficulty in realizing his/her symptom like a chronic disease, he/she may stop treatments on their own intention. For example, only about 40% of patients of lifestyle diseases continue to go to hospital, so doctors cannot grasp their progress. This medical care ignoring outcome at all is a profound problem, so we regard it as the first subject to be improved.

This project develops the software to solve this problem. Examples of the problems to be solved are shown in Figure 1. and 2.

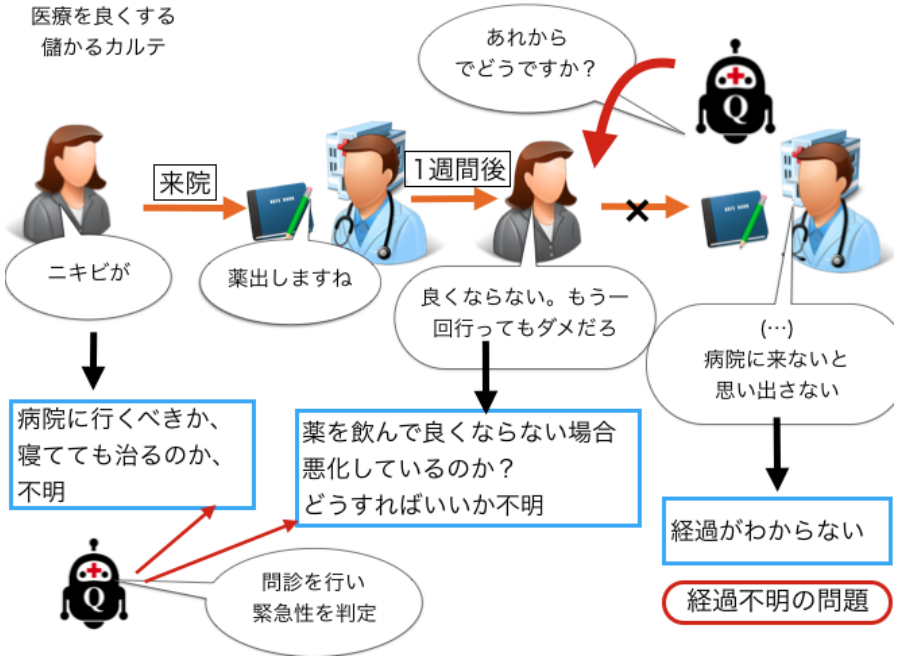


Figure 1. An example of medical problem No.1

Shown in Figure 1., doctors forget patients if they do not go to hospital. This is inevitable for doctors who talk with over 100 patients every day. However, it is important to grasp progress of patients after treatments, so medical care today has a serious trouble without doing so.

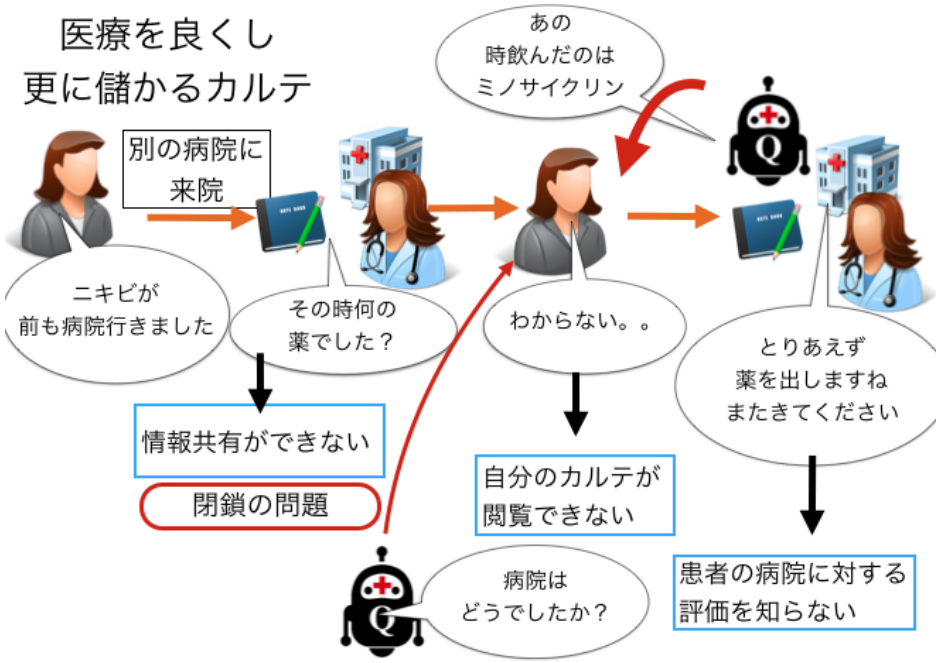


Figure 2. An example of medical problem No.2

Shown in Figure 2, it is difficult for patients to have their own medical information. There are some eager patients to use ‘prescription notebook’, but it is difficult to have it every time in going to hospital, so it is more desirable to make it an application and to have in a smartphone. Moreover, doctors do not grasp the reputation of hospitals by patients accurately. They cannot know ‘how many patients they treat’ or ‘what points the hospital has up to 10 points’. It is impossible for patients outside a hospital to have easy access to medical information in the hospital, so it is very difficult to improve hospitals or medical care.

The introduction of IT in the frontline of medical care progresses rapidly, so it becomes possible for telemedicine to consult with videophone regardless of any distance covered by national health insurance. Chat-bot medical records developed this time have many common points with telemedicine, because both can know information of patients without direct meeting. However, telemedicine is limited since it needs talking with the other, seeing his/her face, so it is categorized into medical care today and cannot easily collect information of progress of patients

This project aims at development of chat-bot medical records that enables doctors to grasp progress of patients. In this system, chat-bot instead of doctors asks patients their progress via chat interface of LINE along the format of electronic medical records. When doctors use this

system, patients can have access to their own medical records via interface of LINE anywhere.

We try to solve ‘the problem that it is impossible to understand progress without going to hospital’ and ‘the problem that it is impossible for patients to see medical information on their own intention’ in medical care with this system.

We said that ‘we have developed medical records’, but medical records are ‘the place where medical information of patients is accumulated’. However, modern medical records are mixed in a complex way with accounting information linked by patients’ information, and contents of prescriptions and so on. All that is really useful in the frontline of medical care is the information of what patients go to hospital, what they regard as a major complaint, and what treatment they accept. We call this system medical records of the chat-bot type and bot can not only ask patients their progress, but accumulate medical information on chat-bot. That is, we call and define accumulated medical data of patients and the processing system ‘medical records’ in a vast sense in this project.

Contents of Development

‘Doctor Q’, the medical records with chat-bot developed by this project enhances continued participation rate of patients at the minimum costs by doctors. Users are patients and doctors, and by adding the bot of Doctor Q as a friend on LINE, patients can receive interview by chat-bot instead of doctors and watch their own medical records. On the other hand, by having access to service website of Doctor Q, doctors can grasp progress of patients and have contact with patients through the bot. We prepare the functions for patients and for doctors.

In the sections below, we will explain the rough outline of system, functions for doctors and patients respectively. Remember that all images or medical information used to explain are made artificially, so these are not based on information of actual patients.

Outline of System

Patients and doctors have access to Doctor Q with each interface. Patients operate all on LINE app. of smartphone and doctors operate on website (Figure 4.). Developed medical

records with chat-bot can record information of patients and patients can see it on LINE. When patients send messages like ‘show me medical records’, or ’show me medicine’ to Doctor Q, they can see the list of medicine prescribed and past medical records on LINE. On the other hand, Doctors can see medical records and reply to patients on website with Doctor Q. Patients receive messages from Doctor Q to interview or grasp progress, and those messages are made by hand on rule-base. We do not use prevalent machine learning technology because these conversation includes critical factors concerning a life of patients. We will avoid the conversation engineers do not know like conversation models made by deep learning. It only outputs clear replies on rule-base that always tells users it does not know about what we do not input. Rule-base here means that all rules are explicitly described that ‘if a word is accepted, it replies’.

Doctor Q is software for doctors and patients, and it has functions respectively. Those aim at the increase of continued participation rate at all. By the increase of continued participation rate, patients who receive medical care only at first will finish their program and doctors will do a better job. It has functions ‘to summarize medical records’, ‘to mark symptom by side-effect of medicine’, and ‘to distribute patients not followed into symptoms’ etc. to grasp information of patients effectively.

Figure 4. Home screen of Doctor Q on Website

Interview System

Patients can receive proper interview by Doctor Q depending on their symptoms. For example, if you send a message like ‘I have a headache.’ to Doctor Q, it does differential diagnosis and teaches whether to go to hospital. A big character is the bot to teach us ‘whether to go to hospital’, ’whether to take medicine’. Many interview systems developed now do a niche differential diagnosis, so Doctor Q makes a difference. Moreover, patients have chance to accept interview from Doctor Q without ‘sending it a message of symptoms’. For example, it is for grasping the progress three days after patients go to hospital. Interview system has a binary tree of ‘Yes’ and ’No’. Its medical knowledge is based on the medical

knowledge that creators to write down that type of textbooks have. Doctor Q has at most three questions to a symptom. That is, Doctor Q has at most eight patterns to convey urgency and seriousness to patients. The symptoms it can deal with now are: fever, tiredness, dizzy, rough skin, mood disorder, headache, insomnia, cough, sore throat, athlete's foot, constipation, stomachache, urination pain, ED, menstrual irregularities, edema, eye pain, quit-smoking, expectation, lumbago. These all are based on medical textbooks and the knowledge of creators. We show you the examples below such as 'I have a pimple', 'My back is killing me.', 'I have a fever'. It can decide their urgency and seriousness on about three questions. (Figure 6.)

Figure 6. To input major complaint on LINE

Reading medical records by patients

When you send a message like 'Show me my medical records' to Doctor Q, patients can read medical records shown in Figure 7. When you scroll screen of interview (left side of Figure 7) to the right side, you can see the all past medical records. We made this function because patients can precisely reply to doctors for the first time when the doctors always ask the patients that 'Have you got a disease?' or 'What medicine have you taken?' Patients can answer by reading medical records accumulated in Doctor Q via chat-bot when doctors ask them for the first time. And when you say like 'show me medicine', you can see the list of

medicine you have taken, and when you push the button ‘Search’, you can jump to the page of Google search. These days, patients are eager to study medicine or their own diseases, so we regard the function to search for soon as significant, considering such a demand.

Figure 7. Interface of Doctor Q on LINE

Doctors’ watching progress of patients

As mentioned in the background, knowing the progress of a patient is important in continuing medical care. For that reason, the system that can check progress with only one button is revolutionary, and the novelty of electronic medical records with chat-bot developed in this project is this point. Three days after the visit, or after the interval at which the doctor has designated, Doctor Q can send the question ‘Do your body get better now?’ to patients on LINE (Figure 8). On the other hand, patients can easily answer by saying ‘get better’, ‘do not change’, ‘get worse’ with buttons. If you get better, you will receive a reply from Doctor Q saying "I am glad, please take care of yourself." If not changed, the doctor will be notified and the doctor will consider the action based on that. If it gets worse, an interview begins and the doctor can read the information that summarizes the interview results, so that the doctor can send instructions to the patient again through Doctor Q. One of the problems of the

current medical form is that the method of acquiring medical fees is ‘procedural’ and ‘the more inspections the doctor does, the richer he/she gets’. He/she should receive the treatment fees as success fees when he/she removes their anxiety or pain, but it is difficult to grasp subsequence of patients. There are few places where he/she actually aims at outcome-oriented medical care. However, Japanese government has also taken the issue into consideration and has formulated the ‘rate of grasping the progress of disease’ to evaluate quality of hospitals. The essential function in such an era is the function to grasp the progress by Doctor Q developed this time.

Figure 8. To watch progress

Doctors’ reading information of patients

It is the medical records that the information of each patient is filled in chronological order. The system developed in this project is the chat-bot type of electronic medical records and can accumulate patient information. The contents can be browsed by sending a message

saying "show me medical records" to Doctor Q bot on LINE. In medical records with chat-bot, a doctor may fill out, or Doctor Q interviews the patient, observes the progress, and describes the contents. Therefore, there is a part that the doctor has filled or that Doctor Q has described in medical records (Fig. 9). In addition, if the doctor makes a description such as 'Continue to take medicine for three days', Doctor Q can automatically observe the progress of three days later. If the doctor does not designate anything, Doctor Q asks the progress three days after the visit and one week later. 'The part Doctor Q interviewed' in Fig. 9 is the output in the form of medical records in which the content of about three questions described in 4.2.2. On the screen, there are three tabs 'time series', 'by intervention', and 'medicinal effect sorting', and when each is pressed, a screen having a specific function is displayed. Details about each will be described later.

Figure 9. Interface of medical records used by a doctor

To summarize medical records

In existing medical records, comprehensive information on patients is arranged in order of time series. It is comprehensive information such as blood test results and order, patient's accounting today, medications administered, etc. Each is important information for patients

and doctors, but in order to grasp the progress of patients efficiently, there is too much information and it is hard to read. For this reason, we have implemented summary function in this system. With this summary function, the doctor will be able to view in table form ‘what has been administered to the chief complaint and what happened to the result’ (Fig. 10).

Figure 10. The table summarizing medical records in time series

Sending and receiving images

Many electronic medical records can display image data, but cannot send current photos directly to doctor's medical records using a camera of patient's mobile phone. We have made it possible with this system. By doing so, the doctor can easily know the urgency and deterioration degree from the medical records (Fig. 11). Incidentally, skin diseases tend to be misunderstood as all judged by images, but in fact there are many things that a doctor cannot decide what disease patients have if he/she does not see it actually, so it is very difficult to distinguish the disease.

副作用の表示

One of the important points in observing the progress is whether the symptoms are caused by side effects of medicine. Drugs have many side effects, so doctors usually remember major side effects, but it is hard to say that they grasp all side effects. In this system, there is a function of automatically tagging whether a drug that may cause a side effect is taken to a symptom that a patient develops (Fig. 12). Doing so eliminates the need for doctors to search for side effects or medicine inserts. The list of drugs to cause side effects is those created by

our creator based on symptoms. In this system, drugs of side effects are detected using the list.

症状別フォロー

The system also has a function to follow patients by symptoms. This function is very important for doctors to follow patients efficiently. With this function, the doctor can realize if the patient tends to lower the continued participation rate for what kind of disease or symptom (Fig. 13). By using that information, the doctor can contact the patient so as to increase the continued participation rate in advance. This function is also a very simple function summarizing words by symptom and extracting those with unknown progresses and defective ones with those words corresponding to them, but it is necessary for doctors. That is because there are ‘symptoms that should not be left unattended’, and the doctor can quickly approach a patient whose symptoms should be responded to promptly and whose progress is unknown.

Figure 11. To display image information simply

Figure 12. To display by symptom and side-effects

Figure 13. To follow patients by symptom

Character of User Interface

The reason for constructing this system using the LINE API this time is in the penetration

rate and convenience of LINE. When creating a dedicated application and observing the progress, patients need to take a step by installing and opening the application, so they may give it up. On the other hand, if the message is sent on LINE and you just pressed the button ‘get better’ or ‘get worse’, the operation is completed in a matter of seconds.

An important aspect of the user interface for doctors is to allow them to observe progress quickly and efficiently. We created the interface that summarizes the functions necessary only for grasping progress so as not to waste time, since he/she is busy in normal work (Fig. 15, Fig. 16). The doctor can grasp the content written on the medical records efficiently, press a button a few times, and he/she can simply return comments to the patient. As to currently popular electronic medical records system, there is nothing that can browse the patient list and send messages to the patient with a single click from the list. In addition, this system shows the doctor numerically ‘how much he/she follows up the patient coming to the doctor’. It is very rewarding for doctors and leads to encouraging patients to seek continued consultation.

Verifying Reputation

This system was actually experienced by 30 medical professionals and 30 patients and we got feedback (Fig. 17). We measured the time until medical professionals could grasp the patient's information by randomly viewing the patient's medical records in time series. By using this system, it is possible to summarize the medical records on the table and display it, so the possibility to cause side effects by drugs can be understood immediately. When Doctor Q was not used, it took an average of 15 seconds to comprehend patient information, but in the case of using Doctor Q, it was shortened to 7 seconds on average. This effect seems to lead to doctors' efficient diagnosis and treatment of many patients.

Figure 15. Patients List

Figure 16. How to comment to patients

You can view the state of the patient on a list as shown on the left. Since only main complaint and important information of process is posted, you can make comments on one screen as shown on the right.

As to the 30 people who answered ‘generally it is possible for them to stop going to the hospital although the illness has not healed’, 15 people answered that they will go to the hospital ‘if LINE bot asks them if they are getting worse or to go to the hospital through a doctor and Doctor Q’, Taking this result into consideration, although the average continued participation rate for Japanese people with lifestyle diseases is currently 40%, it can be said that there is a possibility of improving it up to 60%. If this system is used, patients can receive superb medical treatment instead of halfway treatment, while doctors can do satisfactory treatment and even improve clinic's profit. Doctor Q is the software that makes happiness for both doctors and patients.

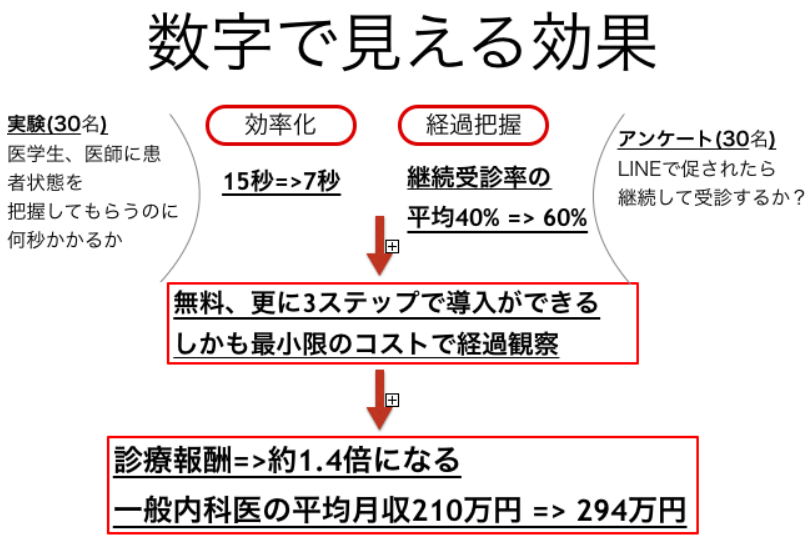


Figure 17. Result of examination

Character of the developed

The biggest feature is that the chat-bot makes appropriate interview to the patient from the contents of the medical records, and the doctor can know the progress of the patient by reports of chat-bot. It is also new that patients can also constantly view their own medical records on LINE.

In existing electronic medical records, all information on patients is cumulatively complicated, and patients cannot view it. In the medical records developed this time, it is new that the medical records makes appropriate questions to the patient, the medical records themselves updates the information, and the patient can see the medical records.

In order to make the features easier to understand, we list the differences from competition (Fig 18). First of all it seems to be the same framework as remote diagnosis at first glance, but it is quite different. Telemedicine is to conduct clinical practice by videophone, so does not collect and grasp patient's progress efficiently. With regard to interview bot, for example, there is a symptom checker bot (Fig. 19) developed and operated by Medley, Inc., which aims at discriminating diseases, but this system is not intended for it. It is an interview bot focusing only on whether symptoms are getting worse or whether people should see a doctor.

競合

遠隔診療

診療を提供するツールではなく、
診療を継続させるツール

問診Bot

問診して症状から病気を診断するツールではなく、
”病院に来るべきか、悪化しているか”を診断するツール

クラウド化カルテ

カルテを共有するツールではなく、
カルテ自身が医療情報を収集、整理するツール

Figure 18. List of competiton

Figure 19. Diseases checker bot

Cite the images from http://www.medley.jp/release/facebook-messengerbot.html

This system is made assuming that even one doctor can introduce the system. It is a system where as easy and few functions as possible are implemented.

Appendix: explanation of terms

- Medical records

  It is about a medical record, and it records the medical treatment progress etc concerning medical care.

- Telemedicine

  Telemedicine refers to the act that a doctor conducts examination through video chat, etc., because a person who is going to visit a medical institution cannot do so directly.

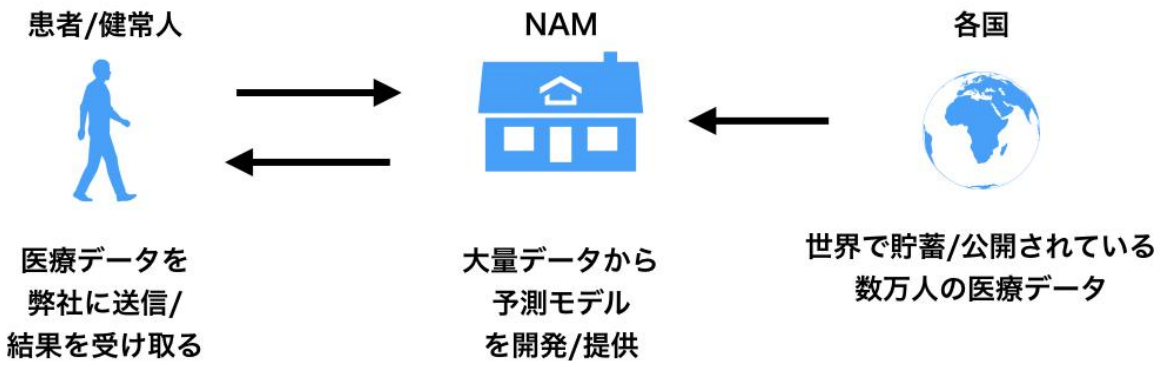
- Insurance Treatment

  Insurance treatment is medical treatment to which insurance is applied. Medical treatment expenses will be borne by the insurer except for a portion of the patient's self-burden (30 % in case of under 70 years old after primary school attendance and in case of active income earners over 70 years old).

- Continued participation rate

  Percentage of patients who regularly visit hospitals for treatment, among those with disease that need to come to hospitals regularly.

Offering diseases prediction model with machine learning



Even if it says prevention as one thing, there are two aspects. There are aspects of finding disease at a stage not progressing, and estimating the probability of getting sick before the disease has developed. For example, in cancer screening for cervical cancer and breast cancer, cancer already exists, but it is meaningful to discover cancer before it progresses. On the other hand, when you see the results of a blood test in a medical checkup, if the blood sugar level is slightly higher, you can get the result that "the likelihood of getting diabetes is higher than healthy one".

We have two objectives of this project.

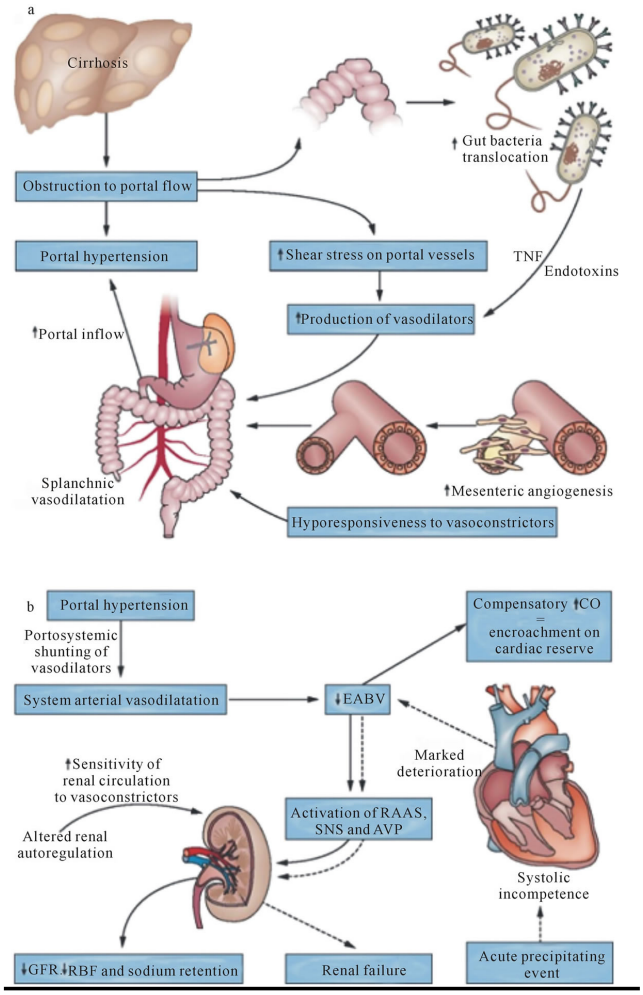
1. A model that can predict diseases more accurate than ever
2. A model that can predict diseases that did not exist in the past

As for 1, we can predict ‘high possibility of becoming diabetes’ with finer accuracy than the existing tests like ‘after 2 years, becoming diabetes at P%’.

We are developing a prediction model of multiple diseases. The data needed for that predictive model is the patient's genetic data, or the patient's blood test data. Therefore, it is possible for our model to use the data that the patient got by a blood test at a hospital in the past or obtained by the medical examination.

Our predictive diagnosis is so cutting-edge that others cannot currently offer at hospitals. The number of diseases predicted by our AI is about 10, and among them there are currently three papers. Probability of liver cirrhosis, probability of malignant cancer, prediction system to detect abnormalities from eye images. We will introduce them in turn.

Hepatorenal syndrome



About hepatorenal syndrome

(Pathophysiology of HRS from Scientific research open access)

Hepatorenal syndrome (HRS) is a type of kidney failure that occurs in progressive cirrhosis (liver dysfunction). The three-month survival rate of HRS patients is 15%. However, biomarkers, settling factors, and useful prognostic criteria have not yet been discovered. There is also no correlation with liver function such as Child-Pugh classification. Fortunately, early treatment is effective and early prediction of HRS is important. This study used Random Forest to predict the onset of HRS in medical records of patients with cirrhosis at admission from the MIMIC 2 public database. As a result, our prediction model achieved AUC of 0.81. This prediction is the initial prediction of HRS and it has become possible to do it from an extremely early stage. This research was a paper and Nakano CEO of our company

presented at NIPS 2015 workshop, one of the world's best machine learning international conferences. As a result of that presentation, Nakano has won the workshop sponsored by Google DeepMind.

After this research, similar researches are conducted by Google DeepMind, the world's best artificial intelligence company. They also focused on kidney failure, working with the kidney experts at Royal Free Hospital in London to develop mobile apps. The mobile application "Streams" is an application that allows doctors and nurses to quickly determine the state of acute renal failure that requires immediate action. As a voice of the frontline:

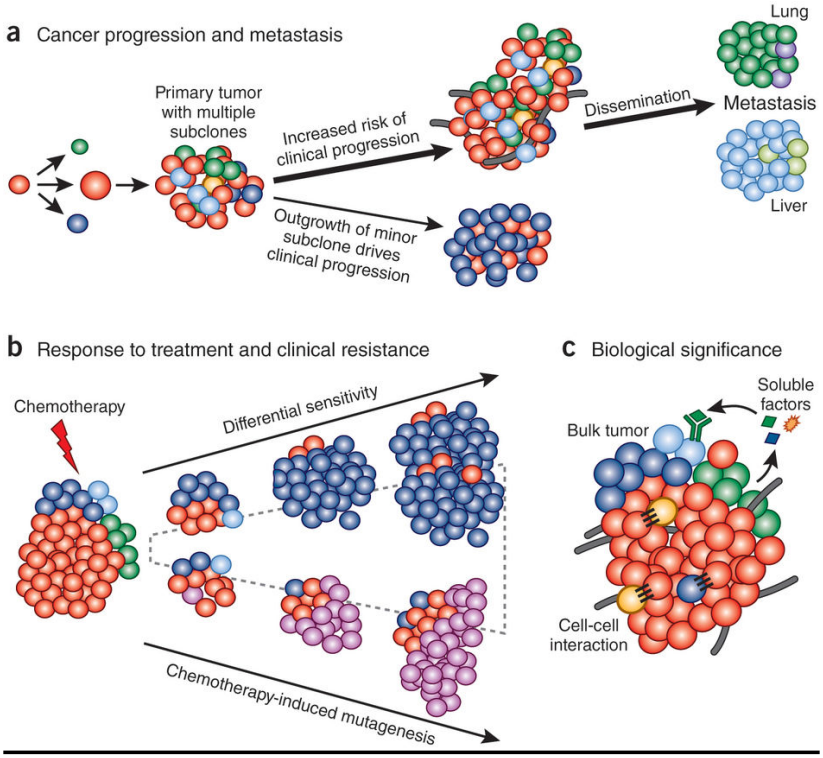
"By using Streams, we can judge the results of blood tests of patients in the crisis of acute renal disorder in a matter of seconds, so that we could take treatment faster than usual, and we could take more effective treatment than before in over half of patients ".

Citation:

Acadeic information: https://sites.google.com/site/nipsmlhc15/

Thesis by Nakano:https://nakano-intro.herokuapp.com/publications/nips2015Nakano.pdf

To measure the malignancy of cancer



Cancer Heterogeneity

(From Nature Medicine.http://www.nature.com/nm/journal/v20/n4/full/nm.3522.html?message-global=remove)

The reason why anticancer drugs are not effective for all cancer patients is that cancer has diversity. Even though we try to mention lung cancer, it has infinite kinds. There are lung cancer that is effective for anticancer drugs and that is less effective, so this cause has diversity. Cancer is a mass of cancer cells. Among them, diversity means how many kinds of different cancer cells are included in cancer. For example, if there is only one type of cancer cell in cancer, it means that there is no diversity, and there are 10 types of cancer cells in cancer, it means that there is diversity.

Based on our research, we have developed a new method to measure cancer diversity; based on the results of development, it is possible to make a new cancer prognostic classification. Conventionally, stage classification of cancer can only be determined by whether it spreads to other organs, and we only make sense of the prognostic classification including the life expectancy in a rough period. However, if we use a method to measure

diversity developed by our company, we can carry out more accurate prognostic classifications.

Citation:

Academic information: https://sites.google.com/view/compbioworkshopicml2017/home

Thesis by Nakano: https://nakano-intro.herokuapp.com/publications/icml2017Nakano_bio.pdf

To determine malignant or benign from images

図 1:提案手法による異常検知

Medical images are indispensable for clinical diagnosis. Diagnosis by images is necessary at all such as physical examination, definitive diagnosis of serious disease. Along with the spread of electronic medical records, medical images have been efficiently stored and compiled on computers. However, analysis using machine learning technology has not been applied in medical field. In order to practice it in the medical field not so as to finish preservation and counting in vain, three factors are necessary in the analysis. First of all, the analysis result is easy to understand for everyone; the second is short analysis time; finally, a system can be used jointly with doctors. In this research, we focus on the point of abnormality detection. What is necessary for image diagnosis is to discover abnormality first. We developed a technique to mark this abnormal point by artificial intelligence before people see

it. In general, this technique requires a large amount of learning data, but with this proposed method to mark is possible even with an overwhelmingly small amount of data compared to conventional one.

Citation:

Academic information: http://jglobal.jst.go.jp/public/20090422/201402299693436645

Thesis by Nakano: https://kaigi.org/jsAI/webprogram/2014/pdf/820.pdf

Future expansion and diffusion

Various models already exist in the clinical field. For example, we classify the grade of liver cirrhosis called Child-Pugh classification, thereby predicting the prognosis of the disease. However, this is only a simple indicator for only five variables in the era when there was no smartphone by which doctors easily can see the prognosis.

Child−Pugh（チャイルド・ピュー）分類

	1点	2点	3点
脳症	ない	軽度（Ⅰ、Ⅱ）	時々昏睡（Ⅲ～）
腹水	ない	少量（1～3L）	中等量（3L～）
血清ビリルビン値（mg/dL）	2.0未満	2.0～3.0	3.0超
血清アルブミン値（g/dL）	3.5超	2.8～3.5	2.8未満
プロトロンビン活性値（%）	70超	40～70	40未満

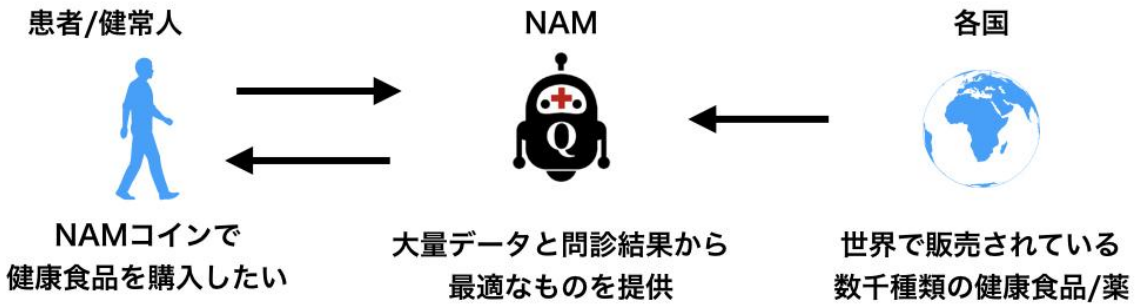
各ポイントを合計して、その合計点で判定する。

- GradeA（軽度）　：5～6点　代償性
- GradeB（中等度）　：7～9点　代償性から非代償性への過渡期
- GradeC（高度）　：10～15点　非代償性

The reason why only such a simple indicator is prepared is that it can be calculated immediately by the bedside. However, to make this level of prognostic prediction more accurate, we need many input indicators. We will develop applications for prediction of

prognosis for all diseases and aim at the medical care that patients and doctors can accurately calculate the prognosis of disease.

Healthy food recommended with **NAM** coin



As for the third product, the medicine that can be obtained at a hospital is basically ‘medicine to treat sick for people with it’ and we cannot get medicine for healthy people to keep them health at a hospital. But keeping health is very important in the sense that it does not get sick. However, normal consumers do not know honestly what and how much medicine to buy and take. In our service, we grasp the constitution and lifestyle of consumers by artificial intelligence’s questioning first. Artificial intelligence selects healthy food from countries around the world in a way that suits it and can provide optimal medicine and healthy food. These services can be used with NAM coin.

Since the types of medicine and healthy food that we recommend and can offer are expanding day by day, we will not describe them in detail in this white paper. Through our website we would like you to confirm updated information.

Next-generation system of medical records

Electronic medical records have not been able to make medical workers more efficient.

The point that medical personnel, insurers, etc. are in trouble about medical records is listed again, but four points below. In response to these problems, the medical record system developed in-house has the following functions.

1. To describe medical records => Automatic input by AI from conversation between doctors and patients
2. To arrange past information => Using natural language processing, AI summarizes medical records
3. Confirmation of insurance points => Based on the database of insurance points, AI automatically displays the points that can be added
4. Examination of medical fees by the government =>Automatic judgment as to whether claims to require two months are right for medical fees by AI

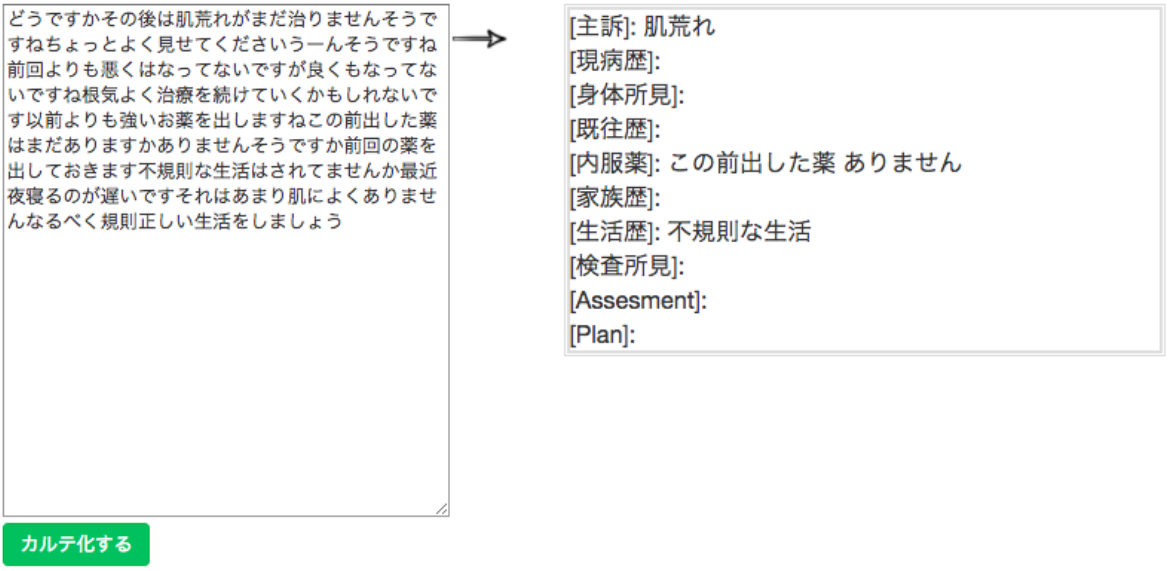
We are developing the medical records with these functions. All of the above solutions are written with ‘AI’ in order to make doctors' work more efficient overwhelmingly. It is not an exaggeration to say that document work and simple work account for a majority as a breakdown of current doctor's work. The doctor has not been able to do the work that should be intensively focused as a doctor. This medical record system aims at overwhelmingly reducing the work of medical staff by AI.

Automatic filling in medical records

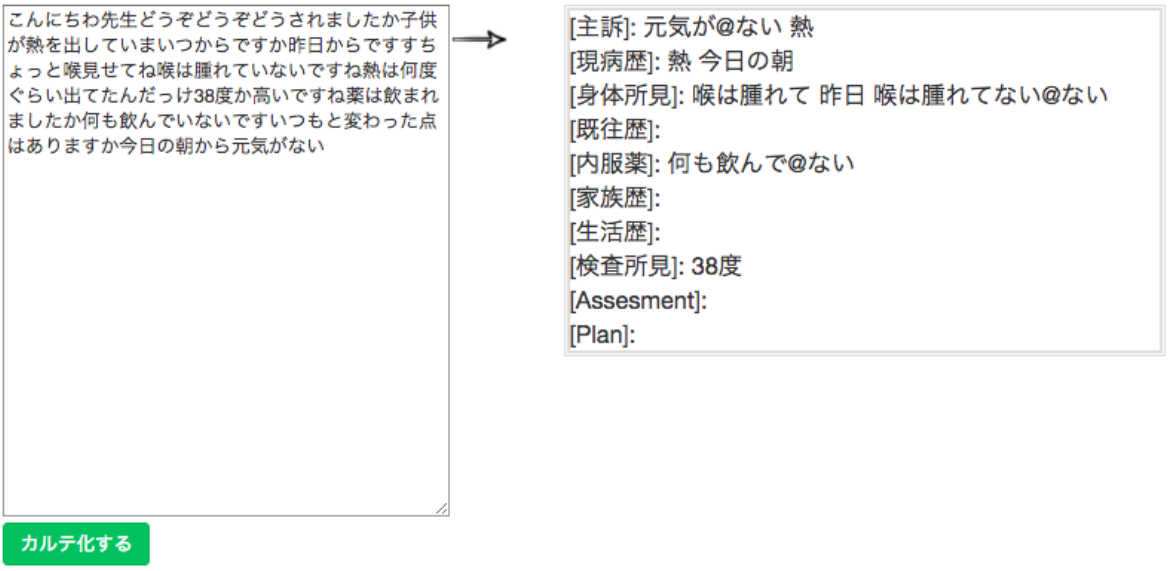
The time the doctor uses to type medical records on the keyboard occupies a large proportion of the working time. Therefore, a busy doctor hires staff of typewriters and try to make doctor's practice more efficient. That is, writing out medical records, especially during outpatient clinics, has no meaning at all. However, from the results of staff shortage and efficiency etc., doctors type medical records while doing medical treatment. By eliminating these actions, medical care becomes overwhelmingly efficient.

. Introduction page of software to generate medical records from conversation

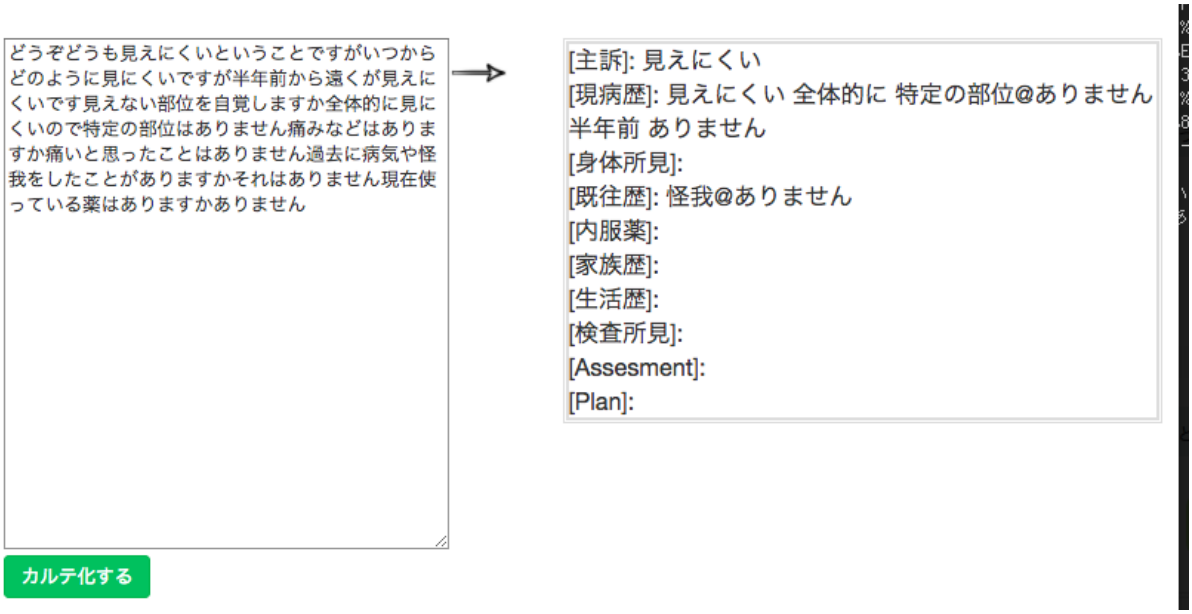
We are developing tools to automatically generate medical records from speech information of conversation using deep learning (https://youtu.be/u86KifC6e3M). Here are some examples of abstracts. The left square is the content talked about and the right square is summarized content.



.An example of creating medical records from conversation in dermatology



An example of creating medical records from conversation in pediatrics



An example of creating medical records from conversation in ocular

The rapid development of information technology has changed medical care. Large amounts of clinical data are digitized and researchers and doctors can easily access them. However, though more and more emphasis is placed on the collection of structured information of electronic medical records (DPC), unstructured texts such as medical records that medical staff fill in daily are still unanalyzed. The essence of clinical information is in unstructured text. Therefore, such a theme is attempted by enthusiastic researchers ‘to extract and structure information’. As unstructured text becomes structured data, researchers can expand the range of models that can predict the onset of disease and therapeutic effects. However, few people argue how such unstructured data is generated. If we analyze complicated data, we think that it is good to generate in a unified format in the data making part. With our software, data is generated in the most standard form from the doctor-patient conversation.

Citation:

Academic information: http://www.nipsml4hc.ws/

Theses by Nakano: https://nakano-intro.herokuapp.com/publications/nips2016Nakano.pdf

Examination of medical fees

As for medical insurance that all Japanese people are supposed to join, if you use this insurance, you patients only pay 30% of the medical expenses, but for the remaining 70%, do you know when and from whom the clinic will receive it? Clinic calls medical fees (70% of the previous one) to the organization called Health Insurance Claims Review & Reimbursement Services (Social Payment Fund) entrusted from the government. The Social Payment Fund examines the request of the medical expenses for consultation from the insurance medical institution (like a pharmacy), calls the Society-Managed Health Insurance, and then pays the medical expenses paid by the Society-Managed Health Insurance to the insurance medical institution etc. Employees of the company subscribes to Japanese Health Insurance Association and the Society-Managed Health Insurance (an insurer) etc., and when the subscriber himself / herself (an insured person) and his / her family (dependents) get sick or injured and go to a hospital (an insurance medical institution) and receive medical treatment, the medical expenses will be charged to the Fund from the hospital in the form of a receipt. The Fund, after reviewing whether the receipts requested from hospitals are appropriate or not, makes medical fee claims to the Society-Managed Health Insurance. The number of insurance medical institutions etc. is about 230,000, the number of insurers is about 18,000, and the number of receipts handled each month is about 79 million, which is an enormous number.

As you can see the number of reviews, it takes a huge amount of time and effort to complete all the processes. It takes about two months for the clinic to get medical payment. Our aim is to shorten the period of this two months to three days by using artificial intelligence. According to this insurance clinical rule, the items to be judged about the receipts requested from insurance medical institutions are as follows.

(**1**) Confirmation of written matter

(**2**) Confirmation of clinical practice

(**3**) Confirmation of medicine

(**4**) Confirmation of medical materials

A judging committee only confirms the document and the name, so it can be seen that if the artificial intelligence supports it, the efficiency will be greatly improved.

About electronic medical records

Except a health professional, people will never see or hear about medical records. In short, the electronic medical records are a mechanism for medical staff to digitally substitute medical records on paper that the medical staff fills in the medical treatment process, collectively manage it as digital information, and make it into a database. In December 2001, as part of the e-Japan initiative, the Ministry of Health, Labor and Welfare (MHLW) formulated the "Grand Design for Information Technology in the Health and Medicine Field" and "to promote the spread of electronic medical record systems to over 60% by the year 2006, in more than 400 beds of hospitals and all clinics nationwide ". However, it is not achieved yet.

Next, the merit and the demerit of the electronic medical records will be described in a bullet.

- Strength
  - The risk of losing records is reduced. It can also be stored for a long time with a large capacity.
  - There is no problem that characters are unreadable because it is not handwritten.
  - Search for medical records can be done at high speed.
  - Medical records can be seen also outside the hospital.
  - It is possible to prevent burning down and disappearance of medical records due to natural disasters.
  - People can do prescription and examination order.

- Weakness
  - It takes time for doctors and nurses to get used to operations.

- There is a possibility that the whole system may go down due to disconnection of the communication network.
- It is necessary to raise security.
- It may become useless at the time of power failure.
- The burden is large. Millions of yen may be required in clinics, tens of millions of yen in normal hospitals, and hundreds of millions of yen to billions of yen in large hospitals.

We focus on electronic medical records,
because they are always in the center in contemporary medicine.
——— NAM ———

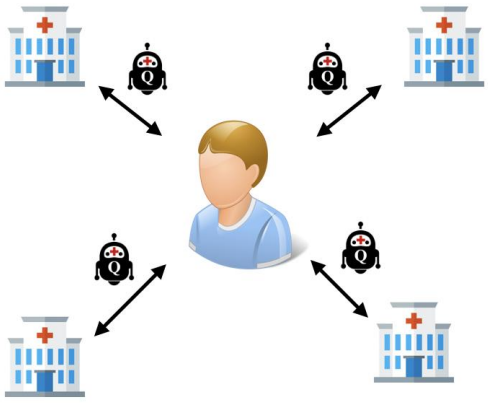
About the database of electronic medical records

Hospital collaboration is evolving day by day. Based on electronic medical records, styles in which medical specialists and primary care doctors hit a single patient together have appeared while sharing medical information such as introduction letters and medical records on the Internet. In this background, as the population ages, the number of patients with multiple diseases also increases, and the importance of sharing clinical information is increasing to avoid duplicate examination and overlapping medication.

With the advancement of medical specialization accompanying sophistication of medical care, it is also possible to ask remote specialist instructions in real time. For example, we cite Miyagi prefecture's "Miyagi Medical Welfare Information Network" (MMWIN). From July 2013 it began initiatives to share medical information between hospitals and nursing homes in two medical zones, Ishinomaki and Kesennuma. "Information sharing" is bidirectional. It shares not only information of hospitals but also that of clinics. Many medical institutions have suffered severe damage in the Great Earthquake of East Japan, and medical records were kidnapped by the tsunami. The crisis awareness of the next disaster promoted this project.

Use case of sharing information among hospitals

Seeing such a case, our business, Doctor Q, has a system to return information on existing medical records to patients. As mentioned above, if you tell the bot "show me the past medical records," the system lists up the past medical records. The older the patient is, the more the patient has history and multiple diseases. The doctor must always check these information, but the patient does not remember all the information. The information should be available for patients free to put in and out, but now it is not possible. If this Doctor Q system is introduced by each hospital and patient, all information can be integrated on the bot.



Patients-oriented medical system with Doctor Q

Medical problem today and the Solution

We will describe the solution to problem of regional medicine by electronic medical record system using chat-bot, specific medical care for foreign people and problems of medical treatment in regional medical care.

Along with globalization, the number of foreign registrants in Japan has doubled for the past 20 years, reaching 2.2 million in 2008. In this regard, opportunities for foreigners to go to medical institutions also increased. Especially in the metropolitan area, the Keihanshin area and the Chubu area, training medical interpreters, establishing a medical interpreter dispatch system, establishing foreign language interview slips for emergency patients are being carried out. For foreigners living in foreign countries, the role of medical facilities plays a major role, which is considered to be an important place for intercultural exchange in

the region. There are local governments where multilingual medical handbooks are provided by the International Association and medical facilities conducting medical treatment of foreign patients can be searched for on the Internet. Our electronic medical records have functions such as automatic conversion in English if patient wishes, which are not installed in existing electronic medical records. It is one of the functions expected for the 2020 Olympic Games.

Needs of foreign patients to medical institutions

It is considered that the number of foreign residents will also increase sharply by the 2020 Tokyo Olympic Games, so it is necessary to respond promptly. Specifically, the following two points are often a problem.

- The environment of medical examination in native language
- High medical expenses and operation to make appropriate examination possible

These problems can be solved by medical treatment in multiple languages by chat-bot, and construction of the appropriate electronic medical record system. Therefore, our electronic medical record business sets a goal in 2020 as one boundary.

To solve problems in regional medical care by improving the efficiency with electronic medical records

In regional medical care, it will be possible to reduce costs in home visits and improve efficiency of home medical care. By consulting with AI such as chat-bot, it becomes possible to conduct medical treatment efficiently even in areas where the number of doctors is overwhelmingly deficient. Specifically, the doctor can omit face-to-face interview and it is possible to drastically reduce the time and costs spent on the visit. They check the electronic medical records created by AI, and if there is a problem, they interact directly with the patient. It is possible to do medical treatment directly then. Patients can receive medical interview without going to hospital or relying on inconvenient transportation means, so it is possible to solve problems in medical care for elderly, and of visits due to lack of doctors.

To stop increasing medical costs year by year with the new settlement method by AI

In Japan, the universal health care system is realized, medical treatments necessary for maintaining life and health are applied to public medical insurance, such as recovery from illness or disability, delay in the progress of illness and disability, maintenance of mental and physical functions. Patients pay 30% of medical expenses for aged 3 to 69 years old, 20% for children aged 0 to 2 years (in municipalities with separate public assistance of expenses), 10% for elderly people aged 70 or over (30% depending on their income) at the window (as of October 2013). Medical treatments, which are not related to them, are free medical examinations (non-insurance medical treatment) that are not subject to public insurance and are all self-responsible, such as cosmetic surgery, orthodontics, artificial insemination, in vitro fertilization, surrogacy and transsexual surgery.

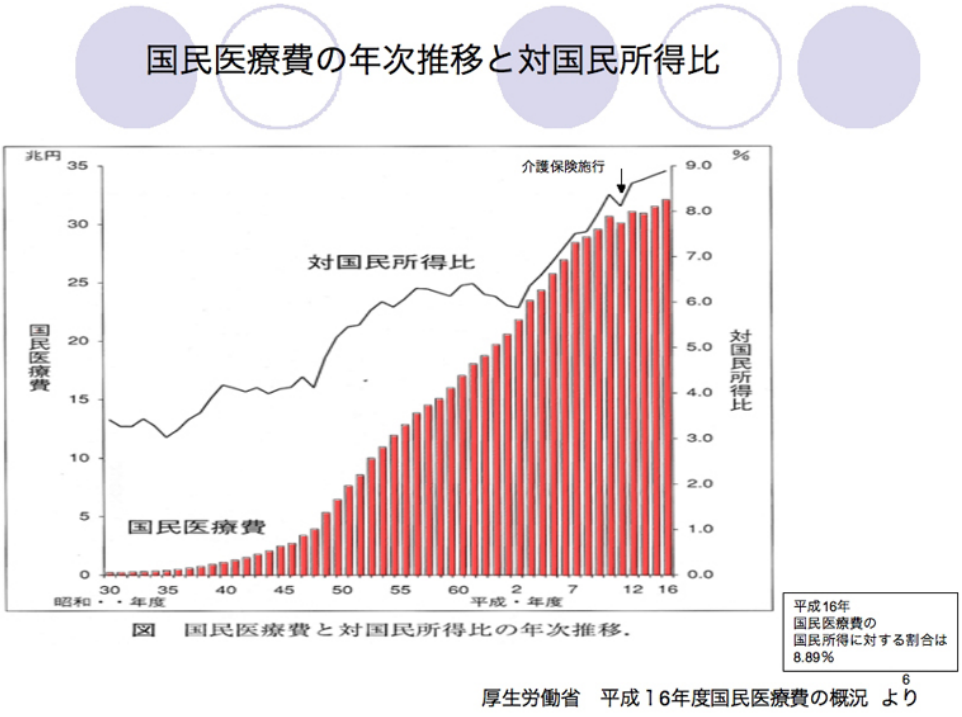
For the purpose of improving management of medical institutions, special function hospitals and some private hospitals adopt the comprehensive evaluation of diagnosis procedure combination (DPC) method instead of the existing piecework payment method. Many institutions receive cash at the window in the settlement method at this time. For this reason, it is thought that the cost of payment, such as personnel in operation, is also wasting.

According to the announcement by MHLW, the total medical expenses for fiscal 2010 is 37 trillion 420.2 billion yen, and the medical expenses of elderly people aged 75 or over are 12 trillion 721.3 billion yen. If it becomes possible to provide solutions to settlement of these expenses, it will be possible to cut the extra costs and reduce the medical cost burden.

According to WHO, the ratio of medical expenses to GDP in FY 2010 is 9.2%, the rate of public expenses burden to the total medical expenses is 80.3%. Compared to the average of developed countries, the ratio of medical expenses to GDP is lower, but the public burden rate to the total medical expenses belongs to the highest group with Denmark, Sweden, Norway, Iceland, the UK, New Zealand etc. For this reason, it is desirable to improve medical systems that calculate appropriate medical expenses and public expenses in Japan.

National medical expenses

Approximate medical expenses or medical expenses of medical institutions are published on the website of MHW as Medical Institution MEDIAS. Aggregate of medical fee points, expense amount, number of cases and days processed by the screening organizations (Health Insurance Claims Review & Reimbursement Services and Federation of National Health Insurance Associations) has been published as the database of estimated medical costs. Medical hospital admission, medical outpatient hospitalization, medical expenses for dentistry and dispensing, expenses for hospital diet and visiting nursing care expenses are included.



National medical expenses increased 24.1% in the 10 years from FY 2000 to FY 2010, and public expenses of medical expenses were from 26 trillion 386.3 billion yen in FY 1999 (7.24% of national income ratio) to 30 trillion 844.7 billion yen in FY 2009 (9.09% of national income ratio), so medical expenses in Japan are increasing at a pace that exceeds GDP or national income. Due to multiple causes such as improvement of medicine and medical technology, an increase in average life expectancy, an increase in the elderly population, a decline in the birthrate, and a decrease in the working generation population, medical expenses are increasing at a pace that exceeds GDP and national income, so how to bear the burden is a serious problem, but people, the Diet and MHLW continue to find effective solutions.

This project could make it possible to reduce costs for these, to improve the efficiency of medical treatment by AI, and to solve the pressure on medical institution management by the burden of medical costs.

A problem under the current situation as mentioned above is the considerable settlement of medical expenses and the costs in terms of accounting. By utilizing electronic medical records, which are one of the projects, not only efficiency of information sharing but also accounting processing in medical business can be greatly improved.

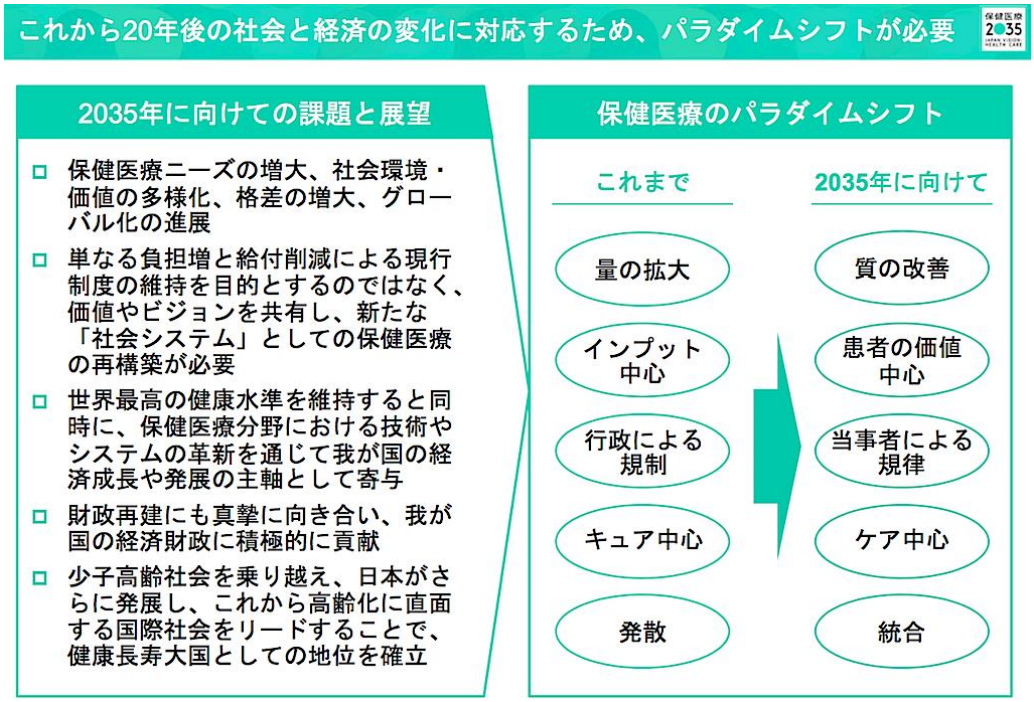
What we can do from tomorrow to halt the increase in medical fees is to replace the document work done by medical staff with artificial intelligence.

——— NAM ———

Given these problems, MHLW also holds a formulating roundtable, "Health Care 2035". The aim is to show the vision and pathway of health care policy with a view to 2035 in the midst of a rapidly changing environment surrounding medical care such as rapid declining birthrate and aging population and advancement of medical technology.

保健医療2035 JAPAN VISION: HEALTH CARE 2035

In this context, MHLW stated that ‘Paradigm shift is necessary’ as set out below.



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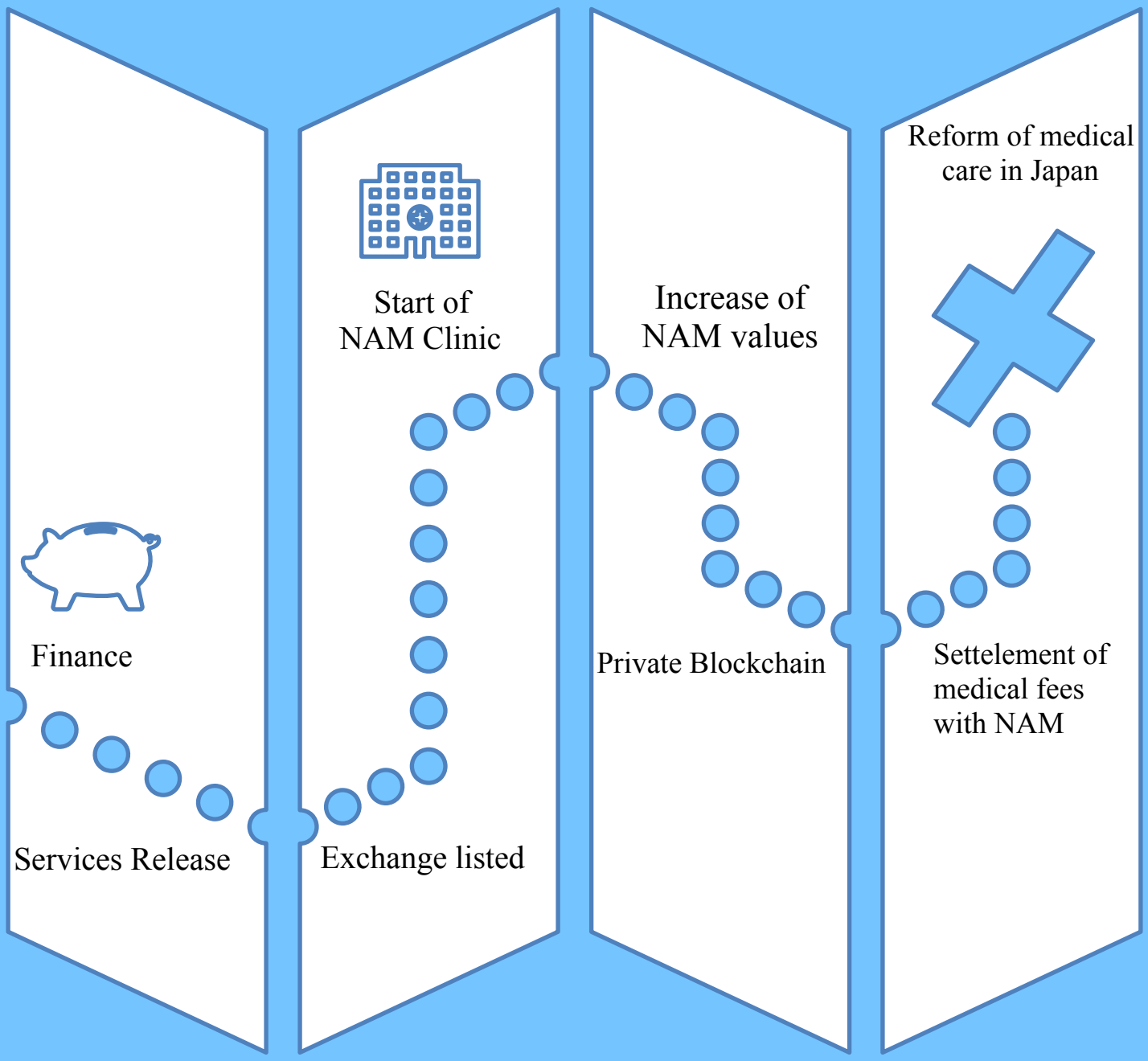
Thus, the MHLW has also declared the state that major reforms are necessary for medical care. The core technologies and services are definitely artificial intelligence and medical payment system. We will concentrate on these two points and plan to develop business that can reform medical care with MHLW.

Starting up **NAM AI** Clinic

Our NAM AI clinic aims at a state-of-the-art clinic stuffed with our medical AI service technology. In this clinic, by conducting blood tests and genome tests, AI that reads the most advanced papers around the world makes it possible to determine all the disease risks of patients. It is the advanced clinic that makes estimation of disease risk and health management using AI, and that other clinics cannot imitate.

It is our own clinic to be the first step for NAM to conduct medical reforms. Presently, medical care in Japan has a specialist system. It is a system where people remember massive amounts of medical knowledge by the day before the specialist exam and exhales it in the written exam. They will gradually forget the knowledge from the day after specialist exam. The best medical care shall always be able to provide the details of the most advanced knowledge and doctors shall provide it in accordance with the patient. But facing the enormous amount of information in modern medicine, it is almost impossible for humans to do such work. Our NAM AI clinic finally aims to conduct appropriate examination, treatment and diagnosis depending on patient's lifestyle and various exams, by AI reading infinite medical information. Of course, a doctor is stationed, and it operates as a medical corporation and a clinic.

4. Roadmap


Finance
Services Release
Start of
NAM Clinic
Exchange listed
Increase of
NAM values
Private Blockchain
Reform of medical
care in Japan
Settelement of
medical fees
with NAM

4. Roadmap of Project

In this project, it is roughly distributed into

1. The stage of finance

2. The stage of developing services

3. The stage of service release and transfer to original private Blockchain

three phases above to spread the project

1. The stage of finance

It is the stage that we make this project recognized and we will finance through ICO. For the investor, we will spread the project to provide various methods to buy NAM coin, to be sponsored widely, for anyone in the world to purchase coins.

Specifically, it takes the form of remittance from each individual wallet to the project's wallet, exchanged with multi-currency (main virtual currency). The period is from December 24, 2017 to March 28, 2018(postponed).

2. The stage of developing services

Based on the funds procured in ICO, we will promote research and development. In accordance with the amount of procurement, we will also proceed with implementing our own Blockchain. We will announce the progress of the project every time from our public relations department. Services that can use NAM coin will be released sequentially. In addition to making it the major settlement currency in medical crowd-funding, which is one of the projects, we will increase the number of affiliated organizations and start the test operation as settlement currency according to the progress of the project. We will also

promote maintenance so that handling will begin at overseas and domestic virtual currency exchange.

Period 2018

Early

Exchange listed

Launch of exchange-listed company's own service,

Release of crowd-funding service

Late

Start of test operation as settlement system

Start full-scale operation of the system

Period 2019 Expansion of business

3. The stage of service release and transfer to original private Blockchain

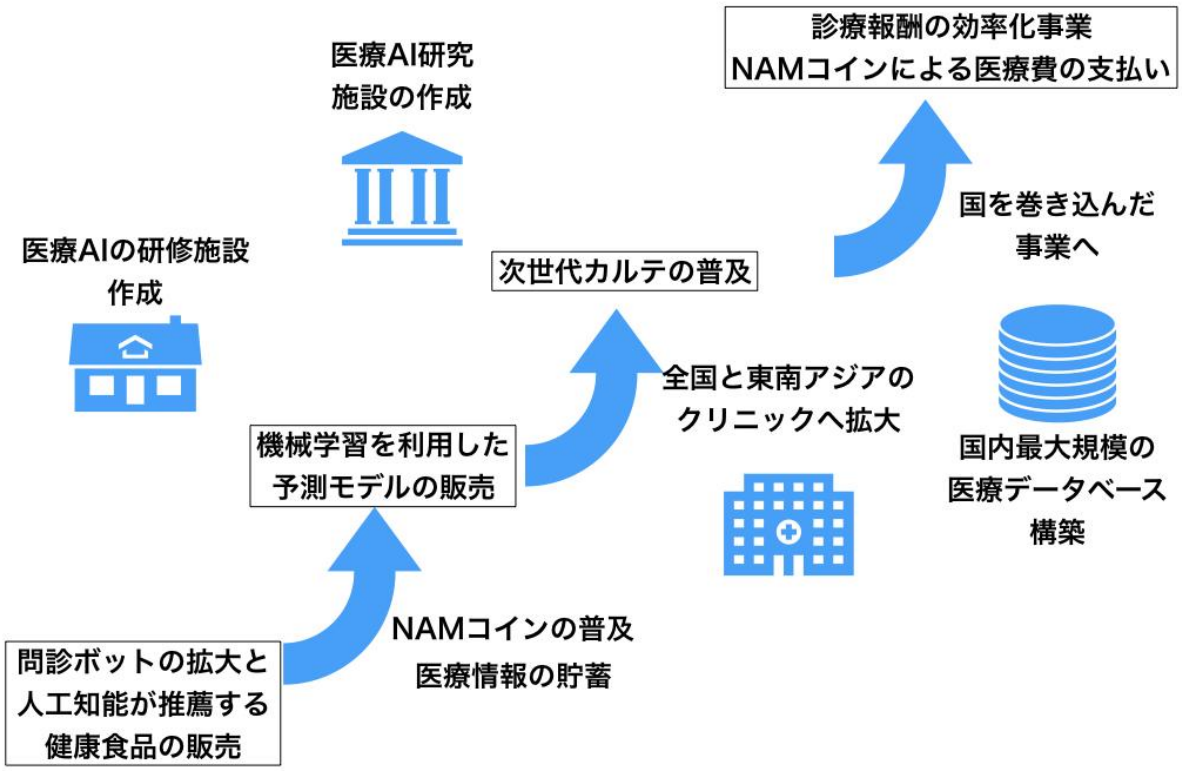
Detailed roadmap of the project depending on funding

Since a large development cost is necessary for the project, the detailed roadmap of the project is described below, according to the target procurement amount. The size of funding is calculated from the costs associated with the project.

As mentioned above, it is divided into four businesses of our own company.

A. Interview bot using artificial intelligence
B. Disease Prediction Model with Machine Learning (NAM Inspection)
C. Healthy food recommended by artificial intelligence with NAM coin (NAM Health)
D. Next-generation Medical Record System using Deep Learning and Blockchain (NAM Medical records)
E. Opening NAM AI clinic

Instead of doing this separately in parallel, they will mutually circulate and revolutionize the medical industry.



Business overview of NAM

CASE1. Funding 50 billion yen

	Doctor Q	NAM inspection system	NAM health system	NAM medical records system	Whole
2017	・To install health management system for employees with consultation bot (10,000ppl)	・To offer prediction model of diabetes	・To offer the most appropriate healthy food by AI with NAM coin (about 10,000)		・To establish and operate the facility for medical workers to learn medical care AI (10,000 members)
1st half of 2018	・To install health management system for employees with consultation bot (100,000ppl) ・To start to expand consultation bot abroad	・Sale of prediction model of diabetes and cirrhosis	・To offer the most appropriate healthy food by AI with NAM coin (about 10,000)	・To arrange data of points-calculating algorithm ・To practice and verify next-generation medical records system (to productize the function of automatic input of medical records)	・To employ 10 engineers specialized in medical care and AI globally ・To establish a research facility for medical care AI
2nd half of 2018	・To install health management system for employees with consultation bot (500,000ppl) ・To expand consultation bot abroad (Malaysia, Indonesia) (100,000ppl)	・Sale of cutting-edge prediction model of 10 illnesses including lifecycle disease like high blood pressure		・To practice and verify next-generation medical records system (to productize automatic points-calculation mainly)	・To employ 30 engineers specialized in medical care and AI globally ・To complete data house to anonymize medical care data safely gov. cannot manage collectively ・To establish a facility with cutting-edge prevention inspection
2019	・To install health management system for employees with consultation bot (1Mppl) ・To expand consultation bot abroad (500,000ppl)	To enable to use our prediction model of 10 diseases in the national health insurance		To develop and install next-generation medical records system	・To employ 50 engineers specialized in medical care and AI globally
2020				To install next-generation medical records system nationally	・To employ 50 engineers specialized in medical care and AI globally ・To enable to pay medical fees with cryptocurrency

CASE2: Funding 20 billion yen

Basically, the magnitude of the procurement amount determines the extent to which the business can be expanded. For example, when introducing a health management system to a company, it is costly to introduce explanations to employees even though we developed the perfect software, so there is only the way to cover it with personnel. Therefore, depending on the amount of funding, the speed of future expansion greatly changes.

	Doctor Q	NAM inspection system	NAM health system	NAM medical records system	Whole
2017	・To install health management system for employees with consultation bot (5,000ppl)	・To offer beta ver. of prediction model of diabetes	・To offer the most appropriate healthy food by AI with NAM coin (about 10,000)		・Presale and to establish an exchange ・To operate the facility for medical workers to learn medical care AI
1st half of 2018	・To install health management system for employees with consultation bot (50,000ppl) ・To start to expand consultation bot abroad	・Sale of prediction model of diabetes and cirrhosis	・To offer the most appropriate healthy food by AI with NAM coin (about 10,000)	・To practice and verify next-generation medical records system	・To employ 5 engineers specialized in medical care and AI globally
2nd half of 2018	・To install health management system for employees with consultation bot (500,000ppl) ・To accelerate to expand consultation bot abroad (Malaysia, Indonesia) (100,000ppl)	・To enable to use our prediction model of 10 diseases in the national health insurance ・Sale of prediction model of 10 illnesses including lifecycle disease like high blood pressure		・To arrange data of points-calculating algorithm	・To employ 15 engineers specialized in medical care and AI globally ・To establish a research facility for medical care AI
2019	・To install health management system for employees with consultation bot (1Mppl) ・To expand consultation bot abroad (500,000ppl)			・To practice and verify next-generation medical records system ・To develop and install next-generation medical records system	・To employ 50 engineers specialized in medical care and AI globally ・To complete data house to anonymize medical care data safely gov. cannot manage collectively. ・To establish a facility with cutting-edge prevention inspection
2020				・To install next-generation medical records system nationally	・To enable to pay medical fees by gov. with cryptocurrency

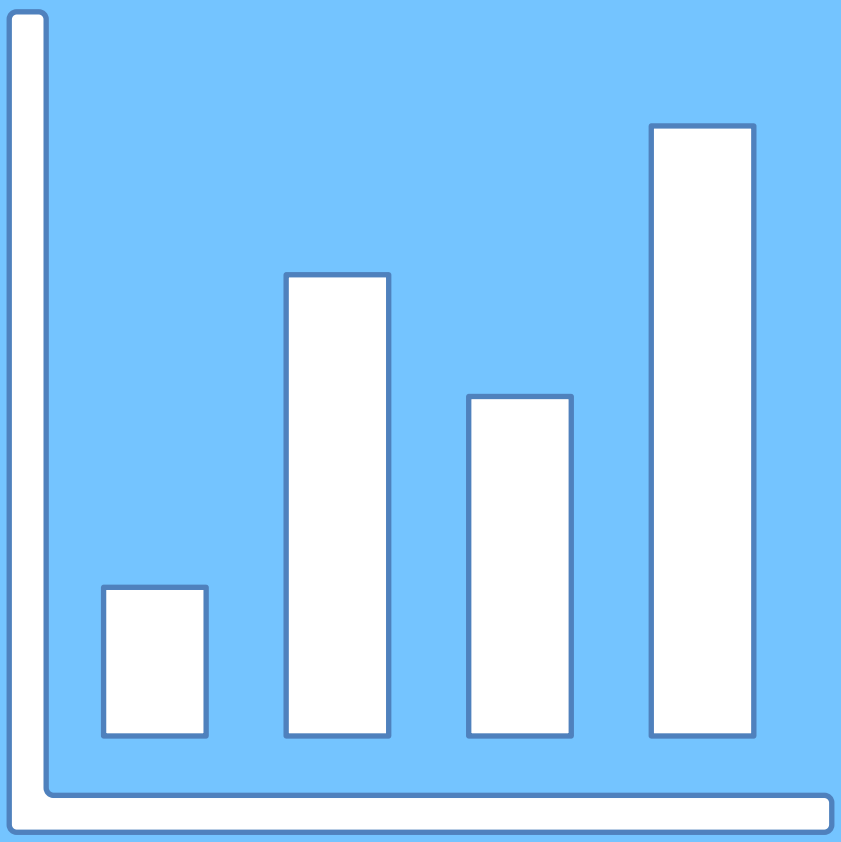
CASE3: Funding 10 billion yen

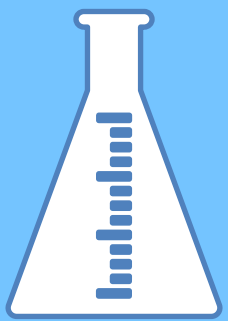
	Doctor Q	NAM inspection system	NAM health system	NAM medical records system	Whole
2017	・To install health management system for employees with consultation bot (3,000ppl)	・To offer beta ver. of prediction model of diabetes	・To offer the most appropriate healthy food by AI with NAM coin		・To operate the facility for medical workers to learn medical care AI
1st half of 2018	・To install health management system for employees with consultation bot (50,000ppl) ・To start to expand consultation bot abroad	・Sale of prediction model of diabetes and cirrhosis	・To offer the most appropriate healthy food by AI with NAM coin (about 10,000)	・To practice and verify next-generation medical records system	・To employ 5 engineers specialized in medical care and AI globally
2nd half of 2018	・To install health management system for employees with consultation bot (500,000ppl) ・To accelerate to expand consultation bot abroad (Malaysia, Indonesia) (100,000ppl)	・To enable to use our prediction model of 10 diseases in the national health insurance		・To arrange data of points-calculating algorithm	・To employ 15 engineers specialized in medical care and AI globally ・To establish a research facility for medical care AI
2019	・To install health management system for employees with consultation bot (1Mppl) ・To expand consultation bot abroad (500,000ppl)	・Sale of prediction model of 10 illnesses including lifecycle disease like high blood pressure		・To practice and verify next-generation medical records system ・To develop and install next-generation medical records system	・To employ 50 engineers specialized in medical care and AI globally ・To complete data house to anonymize medical care data safely gov. cannot manage collectively ・To establish a facility with cutting-edge prevention inspection
2020				・To install next-generation medical records system nationally	・To enable to pay medical fees by gov. with cryptocurrency

Model case to achieve the project

At the Tokyo Olympic Games in 2020, when a tourist coming to Japan goes to a medical institution due to an accident or sudden illness, it can refer to the medical records immediately and diagnosis of a simple symptom can also be performed by chat of each language. By using the virtual currency and settlement system when visiting a medical institution, it becomes possible to calculate appropriate medical expenses of each country and receive medical examination. It is a revolutionary approach to stop any increase in medical costs in Japan at all by NAM products.

5. How to use funding





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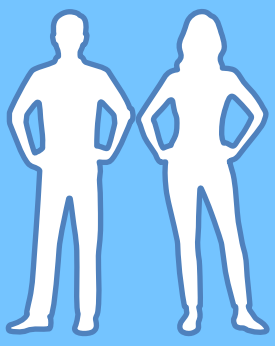


最高のエンジニア集団

5. How to use funding

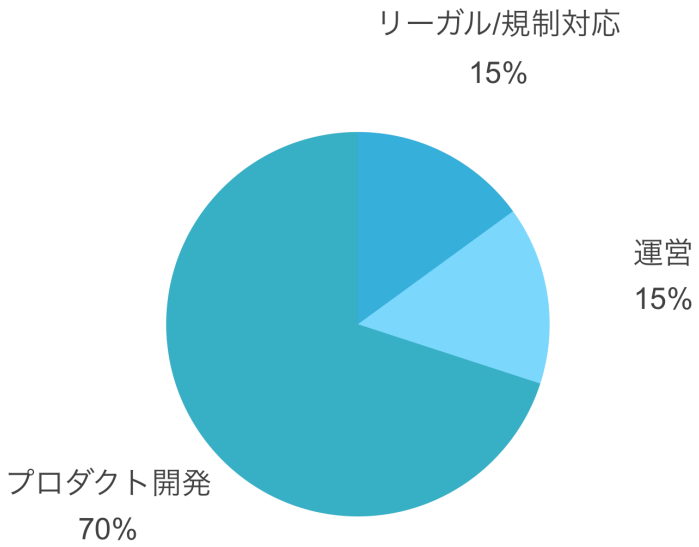
How to use funding in ICO

R&D expenses

Funding raised in ICO is mainly used as R&D expenses for project development. It is the AI technology and Blockchain technology at the core of the service to be expanded, and since it costs a lot for development of these services, it will be used appropriately according to funding as development expenses.

Use as a settling currency

We will develop the settlement system and support introduction to institutions so that it can be used as a settling currency in medical fees. It also makes it possible to use it as a common currency in the platform of crowd-funding of medical business which is one of projects.



Breakdown of how to use funding

Breakdown of R&D

There are two main uses of funds

1. Computational resources for research, development, and commercialization of AI
2. Personnel expenses to develop AI

Next, how to use funds and how to proceed are different depending on the amount that can be procured. We believe that we can innovate in a tough industry of medical care by investing in large-scale funds.

Facilities developed by funding in ICO

Research and administration facility of medical AI

In modern medical care, artificial intelligence has not yet fully penetrated. That is because nobody guarantees that artificial intelligence will work correctly. In current research, when academic papers are accepted by academic societies and magazines, the reproducibility of research is guaranteed. However, even if it is acknowledged by limited researchers, it does not guarantee the operation of artificial intelligence. We would like to establish an institution that guarantees the operation of artificial intelligence.

Consider research on current medical AI is conducted individually at each university. For example, if you made ‘artificial intelligence to find lung cancer from X-ray photographs’, but in the case the original X-ray photographs collected only from people in Okinawa, can it be applied to people in Tohoku immediately? What? It is unknown unless external institutions firmly verify it.

What we aims for is to widen the awareness that artificial intelligence can be used safely by guaranteeing the operation of artificial intelligence and to expand the applications.

Training facility to understand and use AI for every medical staff

If AI is suddenly introduced to a medical institution, the frontline of many healthcare workers get confused. For example, although it is electronic medical records that has been introduced only for the purpose of recording patients, even this electronic medical records have required a considerable struggle to get used to it by people in the field. In other words, when introducing AI to a medical field, what is needed is not only good operability of AI, but education of medical personnel in the field, what is more important. Currently, however, there is no such facility, so there is a possibility that AI education will be conducted individually at each university.

However, it is dangerous. In order to be able to use AI, as those who can handle radiation under a licensed system, it should be necessary to finish certain training. We would like to open a training facility for such training at once.

Robust data house that safely anonymizes medical data

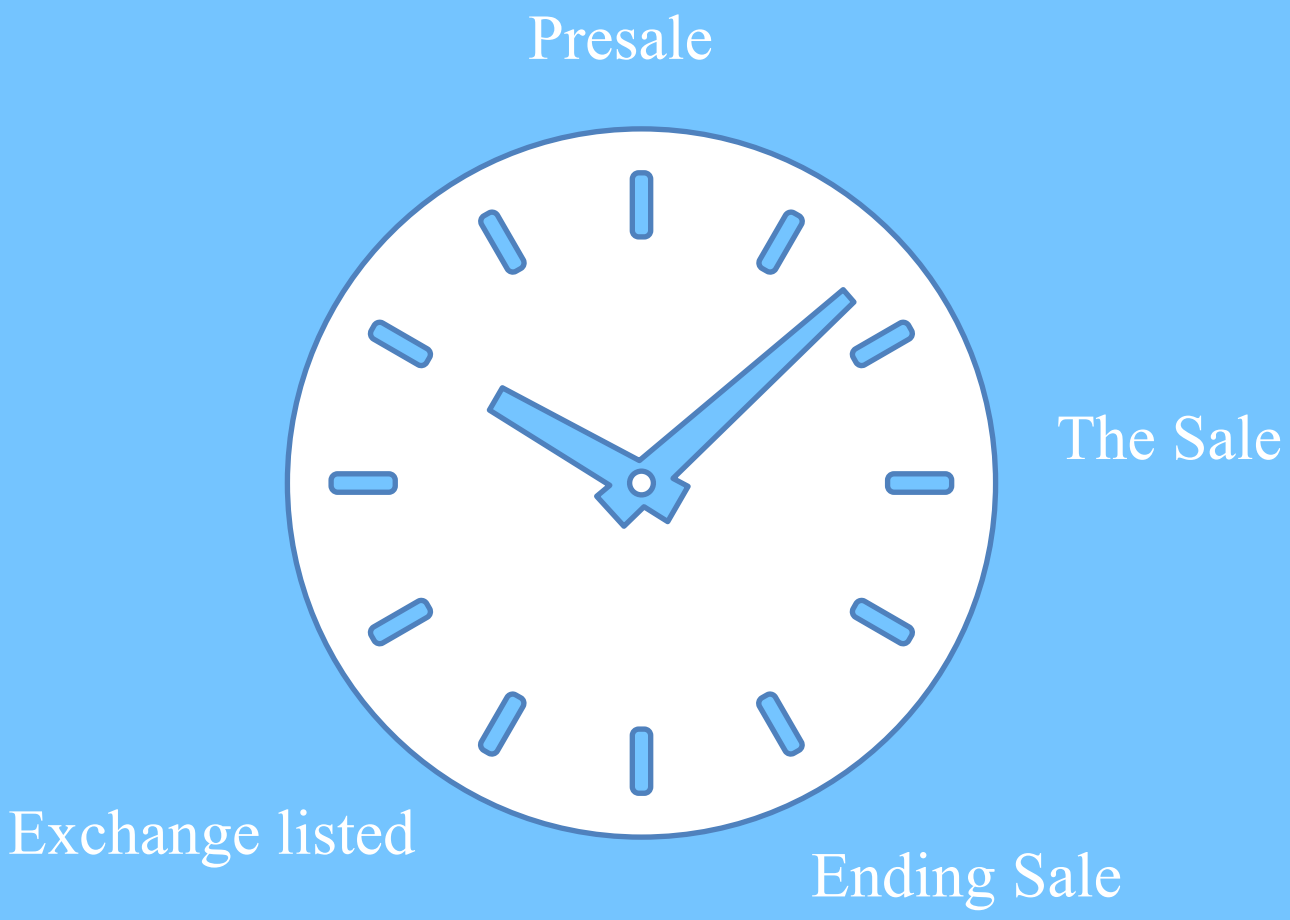
It is very meaningful to manage data collectively. For example, measuring the average and balance of lifetime of Japanese as a whole, not limited to medicine, is necessary to grasp the health situation of this country. It is the same in medical care, as gathering data such as diseases and medicine, the truth comes to be visible, so it becomes easy to take measures against it. However, in the current medical care, only some data can be managed collectively.

For example, we can know how much diabetes medicine was used, but as a result, how well a patient got and how bad he/she got have not been compiled by current medical care. The government also fears about this situation and launched the project called SS-MIX 2 that 'tries to make a standard format of medical records' more than 10 years ago.

Facility with cutting-edge inspections for prevention

Can cutting-edge medical treatment be received at the National Cancer Center Japan? The cutting-edge in the true sense cannot be received within the scope of insurance treatment in Japan. All treatments and examination methods are decided upon receiving deliberations by the government, depending on whether the method is meaningful. However, due to its deliberation period, it is not unusual that even more advanced methods are developed around the time when cutting-edge treatment and examination are approved in Japan. In this context, we would like to make a facility that conducts state-of-the-art inspection outside the framework of insurance treatment.

6. About ICO and Presale



6. About ICO and Pre-sale

In ICO, we plan to raise funds by token sale through token presale on the website.

In addition, for the purchaser of tokens, we will engage in development it as a whole team, in order to provide opportunities for use and to improve currency values by spreading tokens, and to provide returns for cooperation on projects.

Token name: NAM

Code: NAM

Total issues: 120,000,000,000 NAM

Remarks: ERC-20 token based on Ethereum

Maximum number of token sold: 60,000,000,000 NAM

Presale of token (NAM coin)

In presale, we will sell in a form that the token price will rise according to the sales period. As mentioned earlier, NAM will be sold as an Ethereum-based token in the first stage. It takes the form of exchanges at fixed rates against the rate of 3 currencies of Bitcoin, Ethereum, NEM. Each purchase requester remits the currency of each purchase to the purchase wallet, and when it is accepted, a NAM token is added to each purchaser's MyEtherWallet (MEW). Also, due to the bonus described below, the purchaser can obtain a plus token bonus according to the purchase amount.

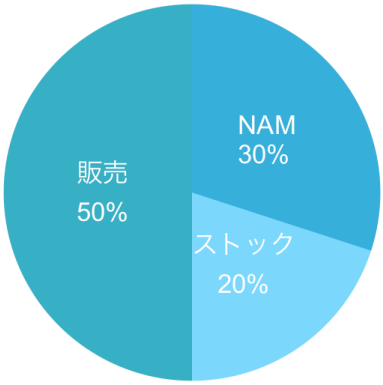
Details of deciding process of token sale and total amounts issued are as below:

Participants of the token sale acquire the NAM token at a fixed rate to any major cryptocurrency. We will issue 120 billion NAM and bring 60 billion NAM to market.

When the upper limit is reached, the sale ends. If the token issuance limit has not been reached within the period, the presale period can be extended with the project's goal and schedule taken into account.

At the end of the token sale, the total number of issues is locked, with the same number of tokens added. In other words, if the number of applications is 100, 100 will be additionally issued. Given total additionally issued 100, the NAM coin to sell will be 50%, and 30% out of the remaining 50% will be distributed to the project management secretariat, project members, development costs and marketing.

Ratio of token



Since there is a possibility that these periods may slide, we will announce more appropriately from the marketing team on website and SNS media.

Token features and benefits

The token can be stored, managed and remitted in the software MyEtherWallet (MEW) provided by open source. This is because the NAM token is a cryptocurrency of Blockchain using the technology of Ethereum in the first stage.

Each individual can store, manage, and remit NAM coin on MyEtherWallet (MEW) until the exchange approves listing, but at the same time, we will spread available services such as crowd-funding using voting modules mentioned below or one using modules of MyEtherWallet (MEW) like market survey.

Burn of NAM Token

We implemented a burn of 100 billion NAM , equivalent to approximately 83.3% of the total issued token volume.

Therefore, the current NAM's total distribution volume is 20 billion NAM.

Burn was carried out at two addresses. The following shows each address and quantity.

We burned 100 billion NAM total.

①

Address: 0x000000000000000000000000000000000000dead

Quantity: 89999823856.4475 NAM

②

Address: 0x236614126bcae65e9c0e0d840acc2fb381301ae5

Quantity: 10000176143.5582 NAM

The above informations are the address and quantity of the burned token.

0x236614126bcae65e9c0e0d840acc2fb381301ae5

Execution of token burning at this address which was done based on the aggregate at the time before the end of sale. Totally 10000176143.5582 NAM has been burned.

NAM token held at this address has been burned and nobody can move it.

Of course burned NAM is not for distribution nor sale.

Please check the address contract code at the URL of Github below. Anyone can check it.

Github URL:

https://github.com/NAM-Inc/NAM-Coin/blob/master/Burn.sol

0x000000000000000000000000000000000000dead

Execution of token burning at this address was done based on the aggregation after the sale ended.

Totally 89999823856.4475 NAM has been burned.

You can also check that the NAM held in this address is being burned.

The status of it’s address is ENS - BurnAddress.

7. To summarize Vision

NAM System from Japan to the World

7 . To summarize vision

A roadmap to innovate medical systems by combining AI and Blockchain technology is shown in this white paper. While having Blockchain and AI technology, companies with multiple medical professionals will be unparalleled in the world.

To be honest, it is very difficult to benefit in the field of medical care in Japan. In the first place, "making money" is regarded as a taboo in the field dealing with a life, and in Japan all people are covered by national health insurance, and most treatments are covered by that insurance. In other words, fewer companies do business with the target of 40 trillion yen, which is strict money of the government, as it is viewed as taboo. Better yet, venture companies that do not have any connection or money will not enter that market. There have been various medical ventures in the past, but eventually they could not have made a major change in medical care. We think that is because money, connections, technology, all were short.

To summarize the white paper briefly, we do the following four projects.

A. Interview bot with artificial intelligence
B. Disease prediction model with machine learning
C. Healthy food recommended by AI with NAM coin
D. Next-generation medical record system with deep learning and Blockchain

By spreading the interview bot, we lead patients to hospitals before the disease becomes severe. Then, by linking the hospital and the patient via the bot, the patient himself can possess the patient information about the medical care. Then, after the patient brings out the data, the patient take a disease prediction examination by artificial intelligence of our company, have appropriate healthy food and keep healthy. If this series of flow spreads throughout the world, we will be able to promote the next-generation medical records we have devised. By being able to intervene in medical records, we can participate in the medical fee compensation business which is the backbone of medical care in Japan. We seek to streamline medical care by dramatically improving the current medical fee system.

The patient will become healthy; the hospital will be more efficient; the national health care costs will fall significantly. When presenting this idea and roadmap to the medical society's heavyweight, the word told in the first voice is "impossible". But we always return as below:

"It is impossible to create an organization that has Blockchain experts, medical experts, AI experts at the same time, and it is also impossible to think that this organization can raise 50 billion yen. In addition, it is impossible for companies and individuals that are highly trusted by society to support this company like a tiny chick. “

If we do so, can you say it impossible once more?

NAM Inc.

Appendix: Links of NAM Project

Website: http://nam-inc.jp/

Twitter: https://twitter.com/inc_nam

Facebook: https://www.facebook.com/NAM-354636678328061/

Slack: nam-inc.slack.com

Github: https://github.com/NAM-Inc

E-mail: lecture@nam-inc.jp

Basic information about ICO in NAM

This white paper describes the initial sale of NAM token. Explained in this white paper, NAM is a designed virtual currency to be used in all services offered by NAM Inc. and partner companies.

NAM does not have the property of securities in any jurisdiction. This white paper is not an invitation to invest, nor in any jurisdiction nor recruitment of securities.

Please note that all purchases of NAM are determinate and non-refundable. Individuals, companies and other organizations must carefully consider the risks, costs and benefits of purchasing NAM.

Restriction of purchasers

Purchase of NAM shall be made solely by individuals, entities or companies with knowledge of the extensive experience of software systems based on cryptotoken and Blockchain, and its use and complexity. Purchasers of NAM must understand the functions on storage and transmission mechanisms for other cryptotokens. Each company of NAM and its officers and employees are not liable for any loss of cryptotoken, NAM or legal currency caused by work or omission by purchaser. If the purchaser does not have the required experience or expertise, such person should not purchase NAM and should not participate in NAM's sale.

When purchasing NAM, you should carefully examine the risks, costs and any other disadvantages of purchasing NAM and, if necessary, obtain your own advice on this point. Those who are not in a position to accept or understand NAM's token sale risk or any other risk described in this white paper should not purchase NAM until they receive the necessary independent advice.

Risk

The purchase of NAM is accompanied by serious risk. Prior to purchasing NAM, purchasers should carefully consider the risks listed below and consult attorneys, accountants and / or tax experts to the extent necessary before deciding to purchase NAM.

In case

(a) The NAM is stored in Wallet and cannot be accessed without entering the password selected by the buyer for Wallet. If the purchaser of the NAM does not keep an accurate record of the password, it may lead to the loss of the NAM. Even if purchaser's password protection is weak and decrypted by others or known, there is a danger that NAM will be lost. Therefore, purchasers must safely keep their passwords in multiple backup locations that are different from the primary use location.

(b) Buyers are aware that some services on the NAM platform are currently in development and that significant changes may occur between the start of service. Purchasers understand that expectations regarding the format and function of the NAM platform may not be satisfied for various reasons.

(c) Buyers may have the best effort to connect the platform with the major majority of virtual currency exchanges, but there may be exchanges that refuse to connect with the platform, so that buyers understand that the liquidity provided through the platform may be lower than anticipated in this white paper.

(d) Buyers understand that although NAM will make best efforts to start platform services on time, the timing of the official release may be delayed.

(e) Just like other cryptotokens, the value of NAM can fluctuate dramatically and there is a possibility that the value may be reduced for various reasons. The reasons for this include supply and demand, overall cryptotoken market conditions, political / geographical circumstances, regulatory changes in one jurisdiction, and technical reasons.

(f) The NAM will be issued in the Ethereum Blockchain. Consequently, failure or unexpected action of the Ethereum protocol may affect the ability of buyers to forward or safely store NAM. Such an effect may have a negative influence on the value of NAM.

Disclaimer

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, REGULATIONS AND REGULATIONS, NAM, each company and its officers and employees agree that the purchaser acknowledges the whole paper, or part thereof, Including indirect losses, extraordinary losses, accidental losses, consequential losses, derivative losses and any other types of losses arising from or relating to the reliance on (including the loss of revenue, income or profit and loss of use or loss of data)), Regardless of whether it is based on tort, behavior, contract or otherwise, we are not responsible.

Each company of NAM, its officers and employees shall be aware that the loss of NAM by the purchaser is due to the buyer neglecting to keep or back-up the exact record of the purchaser's password, We will not be responsible for the loss of the NAM by the buyer after the NAM has been transferred to the purchaser for whatever reason, including password analysis by others due to deficiencies.

NAM will do its best for starting and developing the platform. However, those who intend to purchase NAM recognize and understand that NAM does not guarantee anything about the start of service of the LI platform. In addition, those who intend to purchase NAM shall bear all responsibility and obligation by NAM (including their respective companies and employees) against any losses or damages arising from or related to the inability to use the NAM I understand and understand there is nothing.

Regulators carefully examine projects and activities related to cryptotokens around the world. In this regard, regulatory measures, investigations or decisions may affect the business of NAM, which may restrict or prevent development of its operations in the future. Those who purchase NAM must aware that it may be required to modify the NAM's business model or NAM platform and existing platform or to make modifications on them depending on new regulatory requirements and compliance requirements under applicable laws in either region. In that case, the purchaser and anyone who intends to purchase the NAM recognize and

understand that the NAM or its affiliates are not liable for any direct or indirect loss or damage resulting from such change.

This white paper and other materials or explanations by NAM and its officers and employees are not solicitation for investment and should not be regarded as such. These are not related to recruitment of securities in any jurisdiction or related to recruitment of securities and should not be regarded as such. This white paper does not contain any information or indications that may be considered proposals or may be used as grounds for investment decisions and is not included.

NAM and its officers and employees are not advisors on any legal, tax or financial issues, and should not be regarded as such

Even if NAM is acquired, purchasers do not gain any right or influence on the organization or governance of NAM.

Representation and warranty repudiation

NAM shall not intend to notify any other entity or other person of any kind of representation, warranties or promises, including representations, warranties or promises concerning the truthfulness, accuracy and completeness of the information contained in this white paper and deny making such representations, warranties or promises.

Buyer's Representation and Warranty

By participating in the NAM's token sale, the purchaser shall assert and guarantee the following matters to the NAM.

(a) Buyer has the authority to purchase NAM and its full capabilities pursuant to applicable laws in the area where the purchaser resides.

(b) Buyer is responsible for the buyer himself / herself to decide whether purchase of NAM is appropriate for purchaser.

(c) Buyer is not acting on behalf of any other person or organization who wishes to purchase NAM or participate in token sale.

(d) The buyer carefully examined the risks, expenses and any other disadvantages of NAM purchase and understood the risks, expenses and any other disadvantages associated with NAM and token sale.

(e) Buyers are not acting for the purpose of speculative investment.

(f) Buyer agrees and recognizes that NAM does not fall under any form of securities in the purchaser's jurisdiction.

(g) Purchaser agrees and recognizes that the white paper does not fall under any type of prospectus or tender offer document, nor intends an offering for securities in the purchaser's area or solicitation for investment in securities.

(h) Buyer agrees and recognizes that the information described in this white paper has not been reviewed or approved by the regulatory authorities and has not been undertaken such review or approval under any jurisdiction law, regulatory requirements or regulations, and even if this white paper is published, distributed or disseminated to the purchaser, he/she agrees and recognizes that it does not mean compliance with applicable laws, regulatory requirements or regulations.

(i) Buyer agrees and recognizes that this white paper, the implementation and / or completion of NAM's token sale, or the transaction of NAM in a virtual currency exchange in the future should not interpreted or judged as meaning of the value of NAM or NAM.

(j) What the whole or a part of this white paper or a copy of this white paper will be distributed or disseminated, or the purchaser acknowledging them will not be prohibited or imposed by laws or regulations in the purchaser's area. If the restriction on ownership is

applied, the buyer complies with all such restrictions without imposing any responsibility on the NAM due to its own expense. .

(k) If buyer wishes to purchase NAM, the purchaser agrees and acknowledges that NAM is not classified as any of the following and is not handled.

(i) any kind of currency other than virtual currency

(ii) bonds, shares or share certificates issued by NAM

(iii) rights, options or derivatives relating to such bonds, shares or share certificates

(iv) rights based on CDF agreements or other contracts aimed at securing profits or avoiding losses or for purposes of president

(v) equity in collective investment schemes

(vi) equity in business trusts

(vii) Derivatives of equity in trusts

(viii) Any other securities or types of securities

(l) Buyer fully understands virtual currency, software system based on Blockchain, virtual currency wallet or other related token storage mechanism and operation, functionality, use, storage, transmission mechanisms and other important attributes of Blockchain technology and smart contract technology.

(m) When purchasers desire to purchase NAM, the purchaser fully recognizes and understands that there is a risk associated with NAM and its business and operation.

(n) Buyers agrees and recognizes that NAM shall not be liable for any indirect, special, incidental, consequential, or other loss of any kind arising out of or in connection with the purchaser's acceptance of, or relating to, the whole or a part of the white paper (including loss of revenue, income or profit, loss of unavailability or loss of data, etc.), whether it is based on tort, contracts or anything.

(o) Buyer does not use token sale for any illegal act including money laundering and terrorist financing etc.

(p) From the time the purchaser obtains and / or possesses the entire white paper or (possibly) part thereof, the above representations and warranties are all true, complete, accurate and do not cause misunderstanding.

To update token sale details

At its discretion, the NAM reserves the right to change, modify, add or delete part of this white paper and the terms of the transaction by placing amendments on the NAM website at any time during the sale. Purchaser is deemed to have accepted such change by purchasing NAM. Buyers should not purchase NAM at any point if the buyer does not agree on the latest white paper and the terms and conditions at that time.

Market and industry information

This White Paper includes internal investigations, reports and research, as well as market research, publicly available information and market and industry information and forecasts obtained from industry magazines as needed. In general, although the information described in these surveys, reports, research, market research, publicly released information and publications are obtained from information sources considered to be reliable, it states that the accuracy or completeness of such information cannot be guaranteed. NAM does not conduct independent review of information extracted from information sources of third parties, demonstrate the accuracy or completeness of such information, or confirm the economic outlook on which it relies. Therefore, each company of NAM and its officers and employees are not obligated to provide updated information afterwards without expressing or guaranteeing anything about the accuracy or completeness of such information.