Nissan Leadership Program for Innovative Engineers
–Value Creation for Sustainability and Humanity–

Project Proposal, Compact Edition

Medical CAFE

- Consultation, Accumulated data, Free access, and Evidence -

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1. The Vision of This Project

1.1. Vision and Summary

This project has a vision of realizing a society where people themselves can manage their health easily, and as a means to fulfill this vision, proposes a "**Medical Café**," a new site where people manage their own health.

In places other than hospitals and clinics or places where medical café users live everyday life, this project aims to create sites where they can collect, share, and discuss scientific evidence-based, correct medical knowledge and information required to maintain their health. This will allow users to have an increased awareness of self-healthcare and gain appropriate expertise easily. The ultimate aim of this project is to create a new society where individuals have dramatically improved medical literacy.

1.2. Missions

To achieve the above vision, this project has the following four missions:

- Consultation and explanation by direct communication with doctors (Consultation)
- Accumulation of personal medical information such as physical examination data and diagnostic data (Accumulated data)
- Easy accessibility (Free access)
- Use of medical evidence-based laboratory data (Evidence)

1.3. Reasons for the Selection of This Project

The world health report 2000 published in 2000 by the World Health Organization (WHO) reports that Japan is ranked first among 191 member states in the overall health system attainment assessment. In addition, OECD Health Data 2007 released by the Organization for Economic Cooperation and Development (OECD) reports that Japan has fewer physicians per capita than most other OECD countries, the highest number of examinations per capita of all OECD countries, and also ranks below the OECD average in terms of health spending per capita. Therefore, it is clear that the reason why Japan can manage to provide high-quality healthcare in spite of the relatively low number of doctors per capita is that a heavy burden is placed on doctors. However, this situation has recently produced obvious negative effects such as increasing medical accidents and rapidly increasing emergency patients who get caught in the runaround and are sent from hospital to hospital. On top of that, rapid aging of the population resulting from the declining birthrate followed by a sharp increase in patients is inevitable, so it is very doubtful that the current level of healthcare can continue to be maintained.

On the other hand, Japanese awareness about healthcare is also problematic. Most people think lightly, "My doctor can cure my disease soon when I see the doctor" and "I can continue to receive the current high-quality healthcare services at a relatively low cost (at the current expense levels)." So, they seldom think that they should improve their disease and health literacy and regard disease treatment and health maintenance as problems which they themselves should deal with. In other words, they are very likely to count on doctors to do so.

For these reasons, to continue to provide high-quality healthcare, people's attitude to healthcare needs to be converted from responsibility avoidance (or dependence on other people) to self-responsibility. By approaching the issues in this way, we believe that it is necessary to build a new platform where people can make use of correct healthcare knowledge and maintain their own health easily in areas other than medical care.

2. Proposed Project—Medical Café

2.1. What Is a Medical Café?

2.1.1. Concept

A Medical Café is an infrastructure for everyday life that serves as a new point of contact with healthcare, not merely a place. Specifically, it has the following four functions:

- **Users can consult doctors through direct communication (Consultation)**

  Unlike hospitals and clinics, Café users can consult doctors or other healthcare professionals under a relaxing environment while drinking coffee, etc. These professionals help users understand their previous laboratory data and highly technical data and gain better insights into their current and future physical condition.

- **Personal healthcare information such as physical examination data and diagnostic data can be accumulated on a time-series basis (Accumulated data)**

  We will construct an environment where users' previous records can be stored in a database and accessed by both individual users and doctors at any time. We will provide a system which allows users to update a history of consultation with doctors and necessary information as needed as healthcare technology advances and to manage their health information on their own.

- **People can easily get easy access to Medical Café (Free access)**

  Even people who are unwilling to go to hospital, those who do not need to go to hospital but are concerned about their condition, and those who are so busy to go to hospital can drop into a Medical Café easily at any time as if they walked into a coffee shop.

- **Users can make appropriate decisions using medical evidence-based data (Evidence)**

  Users themselves can refer to their own laboratory data accumulated in a database, seek appropriate advice from doctors or other healthcare professionals, and make appropriate decisions for health maintenance and improvement.

2.1.2. Target Users

The target users of the Medical Café are workers in their 30s and 40s. These generations of workers who support the Japanese labor tend to have insufficient time and awareness to maintain their health, and to have sufficient strength and energy to compromise themselves somewhat. However, when they get older while accumulating damage to health in this period, such lifestyle is likely to induce disease after they become 60 years old. Improvement in their awareness of self-management of health can help decrease the incidence of lifestyle-related disease and develop the health system sustainably. If these generations that support society are healthy, it will lead to realization of a healthy society. For these reasons, we have set the major target at workers in their 30s and 40s.

2.1.3. Why Is the Café Needed?

As disease structure and lifestyle change, hospitals have been required to be not merely a treatment site but also a space that has physical, mental, and spiritual healing effects in itself. In addition, hospitals were not originally isolated from the community but are community-based as hospitals in Western counties date back to community hospitals. In contrast, Japanese hospitals are difficult to access for people who feel somewhat bad and those who are busy, and they are commonly thought to be merely a treatment site. Hospitals are not regarded as facilities for everyday life, and there is a high psychological barrier to seeing doctors.

On the other hand, a café is a casual, elegant, and attractive space that is available to consume time in urban space or a space other than houses, and is considered to be the most suitable space that replaces the above hospital functions. For these reasons, we have selected the café that is considered to be most suitable in designing a new point of contact with health and medical care.

2.1.4. Medical Café Positioning (Positioning Map)

When viewed in the light of understanding one's own condition, comprehensive medical examinations and physical examinations are seen as services similar to the Medical Café. Figure 1 shows mapping typical related services with two axes: ease of use and medical reliability. Therefore, the Medical Café is well positioned to act as a dramatic facility that combines reliability intrinsic to healthcare and comprehensive medical examinations and accessibility comparable to that of the café and bookstore.

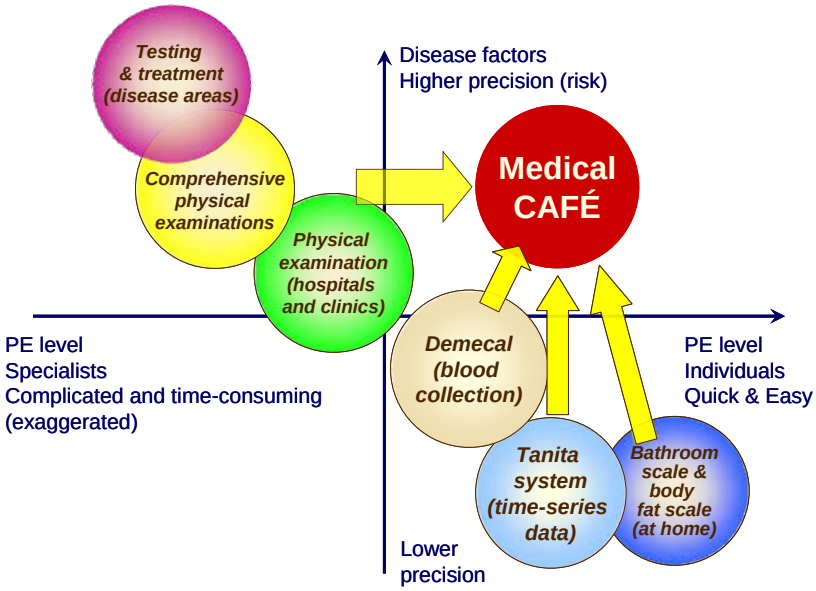

Figure 1 Medical Café Positioning Map

2.2. System Configuration of the Medical Café

2.2.1. System Elements

The Medical Café consists of the following elements (Figure 2):

- **Café**

  Where users communicate with doctors. The Café also acts as a café that serves food and drink. Terminals used to get access to personal data are in place in the Café. In addition, the Café plays a role as a library where healthcare information is readily available. When multiple Café shops are opened as a result of advances in the business, we will form a network among the Café shops that allows data to be accessed at any of the shops.

- **Test equipment**

  To achieve the positioning shown in Figure 1, non-(or minimally) invasive, simple test equipment will be introduced. We will constantly monitor trends in state-of-the-art equipment, and carefully select equipment that have medically high levels. By doing so, we will realize an environment in which users can measure their current health condition without stress.

- **Data server**

  Personal laboratory records, advice records, and other data are stored in a database. This system will also allow data on physical examinations performed at other sites to be accumulated and input into the database and updated as needed. We will offer a database environment, but users themselves are responsible for data management and naturally possess their own data.

- **Doctor**

  A partner hospital is required to send a doctor and a nurse. A doctor is available in a Café and gives users necessary advice. The doctor makes appropriate decisions based on medical evidence while referring to users' previous laboratory data. The doctor also helps users improve their healthcare literacy.

- **Partner hospital**

  The Medical Café works with a nearby hospital so that if necessary, the doctor can refer users to the hospital and users can make appointments to see doctors. We will form a network with multiple hospitals in the future, and allow these hospitals to access the data servers in Medical Cafés.

The system elements will be expanded stepwise from Step 1 to Step 3 over time. The next section describes the system configurations at individual steps.

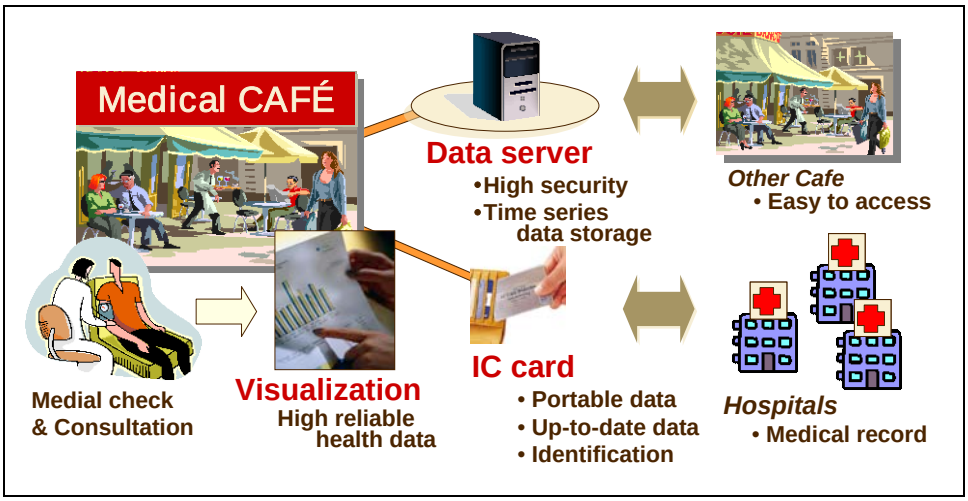

Figure 2 Summary of a Medical Café System

2.2.2. Step 1—Framework: Direct Communication with a Doctor

We will set up a Medical Café to offer a place that allows for direct communication with a doctor. A partner hospital is required to send a doctor and a nurse and the doctor is present to give necessary advice.

The system elements have the relationships shown in Figure 3. Users have points of contact with a doctor and the healthcare information database for health management. Numeric and image data such as physical examination data is accumulated in a database. At Step 1, however, we envision that individual users input such data in the Café. In addition, we will work with the partner hospital to achieve an appointment scheme and thereby a system that allows for referring to specialist doctors and appointments at the Café.

We will realize an environment where advanced security technology does not allow access to the database without authentification by using IC chips to access the database. Up-to-date information will be kept available so that users can access the latest technical knowledge on health and disease as well as the database from terminals. In addition, as other means to gain knowledge at the Café, an Internet environment and medical books will be kept in place.

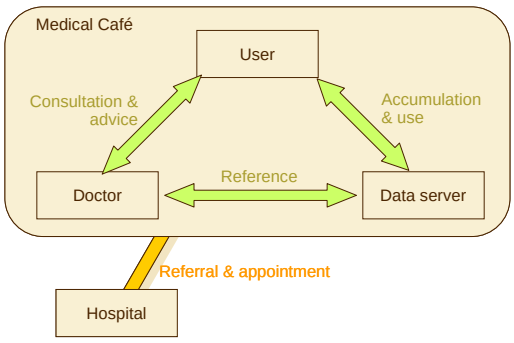

Figure 3 Step 1 System Configuration

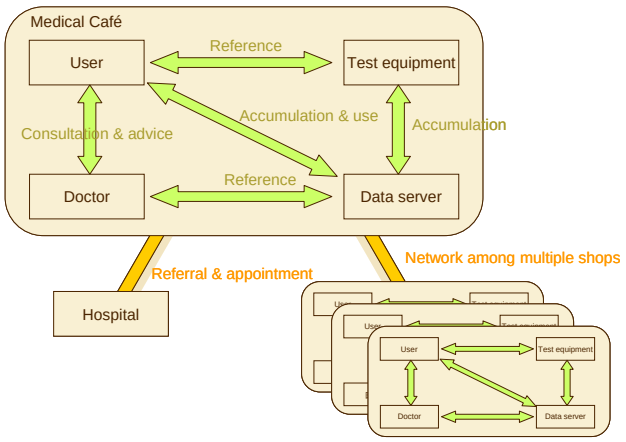

Figure 4 Step 2 System Configuration

2.2.3. Step 2 (2011)—Introduction of State-of-the-Art Test Equipment and Deployment of Café Shops

At Step 2, we will introduce state-of-the-art equipment in about 3 to 5 years. The purpose of Step 2 is to introduce simple test equipment that allows for early diagnosis, including OCT and DNA chips to the Café, and thereby make health management methods more scientifically precise. In addition to the doctor (service) and the data server (software) at Step 1, **at Step 2, state-of-the-art equipment (hardware) is a system element, and this system will become more sophisticated**.

Moreover, more Café shops will be deployed at Step 2. We will deploy the same system in other cities and realize a Medical Café Net while cooperating with hospitals near individual Cafés. We will form a network among the Cafés, and build an IT system that allows users to access their own data at any of the Cafés. This system helps realize an environment where users can consult doctors as usual even during their business and private trips and after moving. Besides, users will be able to remotely contact their personal doctors by using TV conference and other systems. This Step 2 system will reassure users because they can directly communicate at any place and feel connected with their personal doctors with whom they routinely talk about their own condition. Step 2 develops the network of information and space constructed at Step 1, organically and at multiple levels (Figure 4).

2.2.4. Step 3 (2015)—Development toward continuous measurement and strengthened hospital partnerships

Careful research on trends in medical technology indicates that non-invasive continuous measurement instruments will have been developed by 2015. Thus, at Step 3, we will consider the introduction of continuous measurement instruments. Continuous monitoring will help users understand their daily condition more easily and accurately.

In addition, equipment using advanced technology will be available in the Café to accumulate high-quality data on early diagnosis by such more precise equipment. We will realize an environment where Medical Café databases can be accessed from hospitals by making them work with electronic medical records. This will eliminate duplicate examinations at hospitals and help make overall healthcare more efficient. Ultimately, we will create a linkage between hospitals and Medical Cafés to expand the Café system so that electronic medical record data can be accessed from Medical Cafés.

2.3. Business Model

2.3.1. Profit Structure

There are three revenue sources: 1) money paid for food and drink in the Café, 2) monthly membership fee paid by users, and 3) expenses for advertisements from medical equipment and pharmaceutical companies put on terminals used by users. **The membership fee includes expenses for blood tests and echography as standard tests**. In addition, optional services are 1) examinations according to personal condition and weaknesses, 2) results of DNA screening scheduled for 2011 or later, 3) consultation with a doctor based on users' electronic medical records transferred from hospitals, etc., and 4) referring to the most appropriate hospital. These services incur expenses each time they are provided.

In the early stage (2009), Ochanomizu Café will be the first shop, and then two Café shops per year will be opened in major cities. The scheduled candidate cities are Tokyo (Ochanomizu, Marunouchi, and Otemachi), Nagoya, Osaka, Hakata, and other cities with a total of 10 Café shops. The estimated number of members is up to 1,000 per shop.

2.3.2. Business Partners

The business partners we envision include hospitals, medical device manufacturers, and café companies.

- Hospitals: If user interviews by doctors sent to Medical Cafés show that users should be carefully examined, users need to be referred to a hospital. A network will be developed to accomplish that purpose. Hospital appointments may be made at Cafés depending on the results of user examinations and interviews. If necessary, blood and other tests will be performed at partner hospitals and laboratories to obtain timely results. The candidate hospitals in the early stage of this project are Juntendo University Hospital and Kyoundo Hospital. We will plan to make this network nationwide in the future.
- Medical device manufacturers: They are responsible for introduction and routine maintenance of state-of-the-art medical equipment. They will also introduce up-to-date equipment as needed as technology advances. Collaboration with a partner Toshiba Medical Systems Corporation, an advanced medical device manufacturer, based on Ochanomizu is under consideration.

- Café company: The company is responsible for cooking and serving food and drink including coffee. The first choice is Doutor Coffee Co., Ltd. (Excelsior Caffes) because it has a deep interest in health.

2.3.3. Price Setting

- Membership fee: The fee has been set at 5,000 yen/month based on the amount per month of the average expenses (50,000 to 60,000 yen) for comprehensive medical examinations and the results of a questionnaire survey of how much money people in their 30s can put into health.
- Doctor and hospital referral fee: This fee has been set at 10,000 yen/time, which is comparable to that for general medical consultation services that are available at hospitals and other sites. However, the income and expense estimation assumes two referrals per person per year.
- Expenses for food and drink at Medical Cafés have been set so that they are much the same as those at Excelsior Caffes.

2.3.4. Income and Expense Statement (See Table 1)

Table 1 shows statements of income and expenses by fiscal year.

Table 1 Cash Flow Estimation

In 10,000 yen

			FY	1st	2nd	3rd	4th	5th	6th	7th	8th
			Breakdown	2009	2010	2011	2012	2013	2014	2015	2016
		Number	# shops	1	1	3	5	7	10	10	10
			# members	200	500	3000	5000	7000	10000	10000	10000
Expenses	Sales	Running costs	Rental	420	420	1,260	2,100	2,940	4,200	4,200	4,200
			Labor	4,672	4,672	14,016	23,360	32,704	46,720	46,720	46,720
			Maintenance	600	600	1,800	3,000	4,200	6,000	6,000	6,000
		Advertisement		1,000	1,000	1,000	3,000	3,000	5,000	5,000	5,000
	Investment	Capital investment	Equipment	320	500	113,240	5,240	7,240	10,360	120,000	10,000
			Shop system	800	0	1,600	1,600	1,600	2,400	6,000	0
			Headquarters system	11,000	0	2,000	0	0	0	10,000	0
			Shop	1,070	0	2,140	2,140	2,140	3,210	0	0
	Finance	Interest									
		Expenses		19,882	7,192	137,056	40,440	53,824	77,890	197,920	71,920
Income	Sales	Membership fee		1,200	3,000	18,000	30,000	42,000	60,000	60,000	60,000
		Referral fee for finding hospitals and doctors		400	1,000	6,000	10,000	14,000	20,000	20,000	20,000
		Advertisement		240	240	720	1,200	1,680	2,400	2,400	2,400
	Finance	Capital		320	500	113,240	5,240	7,240	10,360	120,000	10,000
		Profit		2,160	4,740	137,960	46,440	64,920	92,760	202,400	92,400
			One-year balance	-17,722	-2,452	904	6,000	11,096	14,870	4,480	20,480
			Accumulated balance	-17,722	-20,174	-19,270	-13,270	-2,174	12,696	17,176	37,656

2.4. Estimated Issues

2.4.1. Data Security

Data server security is a major problem. Personal laboratory data is extremely sensitive personal information, so a robust security system must be developed to protect such information. Even when individuals access their own data, advanced technology such as biometrics must be used for better security. In this aspect as well, we need to keep up-to-date with the latest trends in information technology and to adopt more advanced technology.

2.4.2. Data Ownership

We believe that it is not Cafés but users that should basically have the ownership of accumulated data. However, data needs to be managed on the server, and users do not have actual data at hand. If medical records at hospitals as well as laboratory data are incorporated in the database, then the ownership of the data must be clarified in the future.

2.4.3. Medical Law-related Issues

We assume that if doctors give users advice about health at Cafés, such an act does not conflict with the Medical Law. However, if doctors give users advice while referring to their laboratory and other data, such an act is very close to diagnosis of disease and can be regarded as a medical intervention. In addition, the act of just managing some laboratory data accumulated on the server may infringe on the Medical Law. To develop the system, the system needs to be carefully examined in terms of laws and regulations to ensure the resolution of legal issues. If necessary, we will consider obtaining approval as a medical intervention.

2.5. Created Social Impacts

The Medical Café will revolute individuals' ways of recognition and behavior patterns and is really an innovation. Developing the Medical Café means the creation of a new point of contact, pure and simple, with healthcare in daily life although medical practice has been limited to hospitals and clinics. The creation of this new healthcare service will allow us to realize a new healthy society, and that is expected to create completely new social value.

Creating Medical Cafés to raise citizen's awareness of health and develop and maintain an environment where they can enjoy getting fit also leads to making the community more attractive. Moreover, it will create a virtuous circle in which Medical Cafés encourage local industries to enter health-related fields, resulting in job creation, which will in turn lead to citizen's proactive health improvement. If we regard expanded capabilities of human society to respond as a manifestation of humanism, Medical Cafés will also help realize a humane, affluent society and community sustainability. Moreover, it is expected that Medical Cafés as an infrastructure for daily life will play a more important role in the community and become more mature as a progressive concept that has a social impact on community development and area management.

In addition, as Medical Cafés become more common, more people will be able to understand their own condition and themselves decide what action to take for better health. As a result, there will be fewer people going to hospital without much thought, and in clinical settings doctors will be able to focus on treatment of and research on special diseases that really need to be treated, leading to advances in healthcare technology. Besides, advances in healthcare technology will bring about advances in technology that allows for early prediction of risks of disease and diagnostic equipment technology. We believe that as a result, people will be able to have more knowledge about health and to better manage their health on their own, leading to a continuous virtuous cycle. Finally, the healthcare level in Japan is expected to further rise (Figure 5).

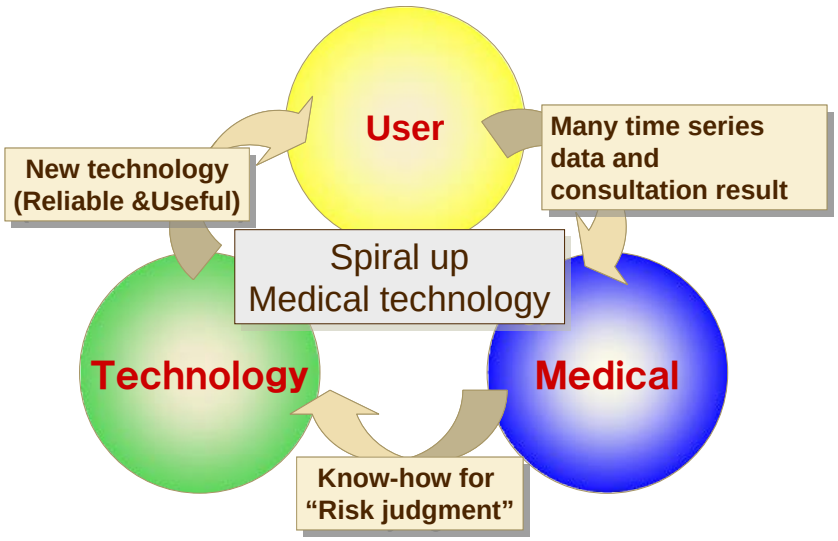

Figure 5 Good Circulation of People, Technology, and Healthcare Leads to Advanced Healthcare in Japan