

Smart City Week 2014
Social Innovation 2014 Next Generation Healthcare Trend Seminar

Title: Life Innovation and Future Healthcare System

Date: Wednesday, October 29, 2014 10:30-11:10

Location: PACIFICO Yokohama

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Abstract of the lecture:

Although the current healthcare system is established based on many years of efforts, it is faced with a variety of issues that cannot be resolved with traditional ways of thinking alone. In the future, more efforts to identify issues from various viewpoints and analyses and establish and maintain a system that fits into the Japanese society and local communities from an integrated point of view, based on shared awareness will provide foundation for life innovations and, in terms of businesses, be essential requirements for ensuring sustainable businesses.

Lecture text

Good morning. Thank you for coming today. I'm not a sociologist, and I have no experience of working for any company either. So I don't know if my story will be helpful for you. I was born in 1956, 10 years after the war, during the high-growth period of the Japanese economy. I was told that my father had also had many difficult times at evacuation sites. After my father's transfer at the time when I was in the second grade or so in elementary school, I spent about 5 years in the countryside, catching insects or chasing frogs in rice paddies. When I thought about going to university, I was unable to make a quick decision, for example about whether to enter the faculty of medicine, but was finally struck by the depth of biology and entered the faculty of medicine on the ground that I could both do research and see patients. With graduation coming up soon, I was again unable to make a quick decision about where to go for clinical training, but I still felt the urge to do research. So I have spent 30 years after graduation working in laboratories, without taking a single step outside.

[Japan-specific issues and universal issues]

About 10 years after graduation, I had an opportunity to study abroad at Harvard University, Boston, U.S.A. The United States is said to be a gap-widening society. In the United States, if you have money, you can get first-rate medical care. But if you cannot afford to pay medical bills, you will be kicked out of hospitals. In contrast, Japan has a universal healthcare system. Although I don't know how Japanese people feel about it, I think that, overall, Japan has a very excellent healthcare system based on the comparison of many countries. As clearly emphasized by the Abe administration, I

think that it is the case that medical expenses will further increase in the future.

Today's my story has two main themes. The first is, "what are Japanese-specific issues?" The second is "what are universal issues?" As most of you may know, Professor Masao Maruyama, who was a political scientist belonging to the Faculty of Law, University of Tokyo, was one of postwar intellectuals. How did Professor Maruyama see Japan's characteristics? There is a point about which I absolutely agree with him. Put simply, the point is that Japan is an "octopus pot society." This is relevant to the story I will tell later.

The second main theme is about Europe and the U.S.A. While I studied in the United States, what I did feel was that the United States was among the most highly specific countries in the world. There are people of different nationalities in the United States. The only thing that works there is logic. That is a world where "one plus one equals two." In contrast, I felt that it was never the only principle on which Europe worked. Although it is natural that some of the teaching staff in the United States, for example at Harvard University, are graduates of Harvard University, surprisingly many of the teaching staff in the United States are from Europe, China, and other countries. To me, there seems to exist an intercontinental relationship across Europe and the U.S.A. in which an idea is provided in Europe and developed in the United States, a country that can invest financial and human resources in the idea.

Now, what about Japan? Since the Meiji restoration, a variety of issues have been raised in rural and urban areas. The Meiji government adopted the policy directed toward catching up with and overtaking great powers in the world anyway and gave top priority to industrialization. Although that may have been historically a correct choice, many people have pointed out that such distortion of a sort underlies issues that Japan now faces.

To tell the truth, the content of today's story is almost never my original story. While I have long had opportunities to think about Japanese society or American society and carried out a thorough investigation since my overseas education, I have obtained information from newspapers, books, or other various media sometimes. Based on such information, today, I will select and present information on which I agreed. Of course, the selection reflects my various characters. In a sense, I will present here the ideas that I selected and agreed on.

[Roles of companies]

What I first want to share most with you today is roles of companies. You belong to companies. As I will argue later, it is understood that companies contribute to society, get profits in return, and make use of them in subsequent corporate strategies. This means that companies develop continuous activities. Such activities involve social contribution. All of us human beings are social animals that are engaged with society. This is the actual truth, where there is one value judgment regarding what

the happiness of human being looks like. If there are many such judgments, directions are lost. In businesses that develop in such settings, we moderns have to be aware that the situation where “as a result, businesses have earned profits but people may get unhappy” should not develop.

For example, advanced medicine is progressing rapidly. As a result, things that we never even thought will be possible. An example of this is human cloning. It is possible in principle. It is possible both in principle and genetically to create a human being identical to you. But, is it acceptable to promote this?

Or, gene analysis allows us to predict how many years later and how likely every individual of us is to get breast cancer, lung cancer, or uterine cancer. The issues that we are now asked most about are how it should be used and how personal information should be protected to actively use the analysis. Furthermore this situation is not just limited to Japan, but is a big issue all over the world.

In contrast, with advances in scientific technology, life phenomena that were previously unknown are being understood. Based on such understanding, a variety of medical technologies and industries will be created. While this is very good, evidence of a specific problem raised from this has been actually found. How should we solve the problem? This specific problem is how medicine should be seen as health science. We cannot comprehensively discuss at the county level specific problems that have to be solved on an individual basis, because situations vary among regions.

So, I take Yokohama as a specific example. As you know, the Life Innovation Special Zone was accepted as “Keihin Waterfront International Comprehensive Special Zone” “National Strategic Special Zone” under the Democratic administration or Liberal Democratic administration, which announced the promotion of relaxation of regulations in Yokohama. But, although individual efforts have been initiated, they are halfway to the realization of a variety of specific forms of regional partnership. In contrast, I am a person belonging to a university and, as such, will talk about what contributions to society universities want to make. Finally, I will summarize the most important message to you.

First, as you know, although there are various views of happiness, what are we living for? Ultimately, for health? The WHO defines health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. What does a state of happiness mean?

What we are seeing is that “life innovation”, which human beings have pursued for a long time, has advanced in the last several centuries and brought about a variety of innovative findings one after another. This means that the analysis of human genes, genome information, and other events have happened at an accelerated pace. A human being is an animal that has quite a high-level brain function and thus can think about various complex things. Although we are special animals, it is an

undeniable fact that we are one of the animals. Nevertheless, in most arguments, I have an impression that the fact that we are also living beings is overlooked or ignored. Especially as a biologist, I can't stop thinking so. I think that many authors of newspapers or journals do not have a point of view that "we are also one of the living beings." We have a long history of evolution in which both humans and animals acquired prey over an extremely limited amount of food or endure hunger during the long process of evolution.

As you know, diabetes is now one of the most common adult diseases. How do you think the number of patients with diabetes differs between the immediate postwar period and the modern period? The difference is 50-fold. What this means is that human beings are being rapidly placed in an unprecedented situation, which is relevant to food or living. Now, dramatic changes that humans experience for the first time have occurred in the recent 100 to 200 years. All of such changes, including declining birth rate and population aging, are relevant. I think that all of such changes are relevant, although they do not seem to be. Frankly speaking, we are still not adapted to this rapid evolution. The term "adaptation" here means that we establish a social system to allow us to address the evolution. I don't think that the adaptation is achieved.

[What is a state of happiness?]

What brings about a person's happiness? When it comes to happiness theory, there are famous theories of happiness proposed by Bertrand Russell, Hiltz, or Alain. What is common among them is calmness. Very interestingly, Hiltz wrote that happiness requires alternating periods of work and rest. In other words, we sleep well at night because we work. Doing nothing but working leading to overwork can never be said to be a state of happiness, while doing nothing in a person's spare time is not a state of happiness. So, it is good that work and rest alternate. Possibly, this may be true for money. Although I know many acquaintances who got rich, being rich is quite hard. Just imagine. A person gets rich. Then the person eats high-grade rice one time. As a result, the person can't adapt when the person's money was used up.

In many living beings, situations alternate between having money and having no money, being rich and being poor, and being healthy and being not healthy. That is the situation we human beings are constantly in and this situation is natural. Although nowadays many people sit before a personal computer and work so hard to dash off their work, data indicate that such people are more likely to suffer from depression and other diseases. People work hard to get what they want or get paid more to buy a car that they have wanted to buy for years. Although this is one form of self-realization, we have to do exercise to be balanced with work. This is very important for employee management.

I am a researcher in Pharmacology, do research on drugs acting on the brain, and am very interested in brain functions. A key point is that in the human brain, high-level desires that are very human, such as a desire to do things for other people, a desire to contribute to society, or a desire to love

someone, involve the prefrontal region. However, humans also have a respiratory center in the brain, which corresponds to the region of the brainstem that provides the foundation of the prefrontal region as well as the regions deep in the brain, called as the basal nuclei and the hypothalamus. If there is no respiratory center, we are not able to live strongly. Information commanding an animal to seize prey when it is hungry is transmitted along the hypothalamus or brainstem. The animal is then driven to seize prey. In contrast, one person has the combination of humanity, joy of creation, joy of social contribution, and so on. Thus, the behavior of getting one after another thing, as discussed earlier, is a driving force that becomes relevant only after a person is placed in a very constant and restricted situation.

The world is now progressing in a direction in which any desires are enhanced more and more. Is this happy? Of course, this will generate business opportunities. Some people may think that anything saleable should be sold. But, this enlarges desires. What is the result? Enlarged desires will develop into scrambles to get foods or domains or various types of war. Based on historical reflections, of course including Europe, colonial policies or imperialism policies were increasingly expanded into a direction towards getting domains or foods.

We are now in the same situation as this. A decade ago, there was no room for discussion on global environment. But, as you know, CO₂ or global environmental problems are now our issues and green innovation and so on will become increasingly more important. That is to say, we have to create a sustainable society on this limited earth in the days ahead. Moreover, although Japan, Europe, and U.S.A. are described as developed countries, China, Asia, and developing countries, including Africa will increasingly pursue a level of living similar to ours. The earth can never endure these circumstances. So, we have to seek a direction to ensure that the world develops in a peaceful manner while achieving a balance with the earth controlled with a certain level of restriction.

In contrast, what about healthcare? As discussed earlier, in healthcare, things that were ever impossible are now possible and more and more patients can be saved. In the past days, some patients could not be saved no matter how hard we tried. It is not that persons called as “doctors” or “nurses” existed in the first place. In the past days, ordinary people took a role as doctors or nurses. A mother may have been the closest doctor. A mother knew what to do with her child with fever on an empirical basis. However, because it was not life-saving, doctors and nurses have been gradually established as specialized professions, during which “healthcare” has developed because it was quite difficult to save patients and research was necessary to address such difficulties.

[Healthcare system for society-wide mutual aid]

In healthcare, there are always both receivers and providers of care. I’m sure that you moderns agree with me that we have no choice but to leave medical care up to doctors or nurses. We have no choice but to leave difficult neurosurgical procedures up to neurosurgeons. However, in consideration of

changes in the structure of various diseases, my message in this figure is that this is not true. In a word, this is due to such extension of medical knowledge, increased potential of healthcare, and ethical issues. Ethical issues vary among countries. For example, when viewing issues of euthanasia in the Netherlands and so on, Japanese people think that it is not a very good idea. After all, ethical issues depend to a large extent on cultural background. So, such issues cannot be left up to healthcare providers. In addition, there are issues of financial cost. We healthcare providers eliminate the thought of money in the face of patients. We think that, “I want to provide the best treatment for this patient anyway”, without thinking about money. This is the nature of doctors or nurses. But, what happens if we actually press it? We are faced with a very difficult tradeoff dilemma. Such issues can’t be resolved by healthcare providers alone.

Attainment of understanding of a disease will be followed by prevention of it, but doctors or nurses devoted to patient treatment can’t afford to take preventive measures. We have no choice but to establish a social system to take such preventive measures. For example, just imagine “cancer.” Cancer is now a disease that is curable if detected early. But, it is difficult for patients and the most common case in clinical practice is “why did you leave the cancer untreated until it looked like this?” Although it is important to detect diseases in the stage of prevention, the current situation is that this is still not ensured in the Japanese society. What should we do for early detection of cancer? Early detection is never achieved only by doctors or nurses and absolutely requires the use of internet or establishment of various social systems. Detection of subtle evidence of early-stage cancer is by far more difficult than detection of advanced cancer. So, a variety of technological approaches are necessary for early detection of cancer. Early cancer detection, especially in everyday life, is the field which requires “innovation.”

Recently, I saw a piece of impressive news on TV. The news was about volcanos. News about the eruption of Mount Ontake or other various problems with volcanos is reported by the media. Such news is very sad. Prediction of volcanic eruption is performed not only by the Metrological Agency, but involvement of local residents is also useful for the prediction. For example, in case of the eruption of Mount Usu in Hokkaido, residents were successfully evacuated early based on a combination of information such as the findings of smoking a little more frequently or a slightly greater amount of white smoke.

That sort of thing is also necessary for healthcare. It is not good to leave healthcare entirely up to doctors or nurses. This is my message. People other than doctors as well as business people should be actively engaged with healthcare at all costs. People in companies attending today can, naturally, find business opportunities there.

An article of the Constitution of Japan, which was noted by Professor Masao Maruyama, as mentioned earlier, has provoked various controversies in the Diet. Article 12 of the Constitution of

Japan states that “the freedoms and rights guaranteed to the people by this Constitution shall be maintained by the constant endeavor of the people.” Professor Maruyama pointed out here that “such freedoms and rights are not guaranteed if left alone.” He meant that we should more actively maintain the Constitution or our own rights, or that we should take politics seriously and should maintain such freedoms and rights. The same is true of healthcare.

We have previously left healthcare entirely up to doctors or nurses, but the thought that we just have to blame them for any medical errors made by them no longer applies. We have to discuss together what healthcare should be or what form of healthcare should be actively realized. Should we leave healthcare up to doctors, nurses, or pharmacists? The answer is “No.” I feel that the public awareness about health is very low. Don’t you think that healthcare is provided, but not maintained or created? That is not the case. It is necessary to transform healthcare for ourselves. Society-wide efforts are required. It is necessary to consider healthcare, including the saving of healthcare cost or humanitarian issues.

Human beings must die. Before patients die, they say “I was happy to be cared for by you. It is a blessed relief.” I’m sure that individual patients or providers or receivers of end-of-life care wish for death with dignity. So, we have to provide possible treatments towards it, while reducing costs. To that end, maintenance and promotion of health, prevention, and recovery from disease are required to be achieved. As discussed earlier, making social contribution is one of the states of happiness. Things like that should also be considered.

And, for these reasons, a direction is necessary for making society work. If you agree on a direction in which that society should be headed, you should make every effort towards that. As said earlier, the human brain is not God or the devil. Human beings lie between them. So, it is not surprising that human beings have a wide variety of desires. However, it is necessary to establish a system that provides an incentive for society to ultimately go in a good direction while utilizing such desires and seeing human beings as such in a cool manner.

To establish such system, I think that we can make all kinds of efforts, including assigning scores to those who are careful of their health and discounting medical expenses equivalent to the scores. Although a person’s health is for the person’s own sake, individual patients do nothing no matter how frequently they are told it. First of all, no matter how high their blood pressure is or no matter how high their blood glucose level is, they do nothing if no problems occur. Given that this is just human nature, the establishment of an active social system in which people can prevent getting sick or promote their health will lead to healthcare cost reduction, which gives rise to big business opportunities.

I would like to add a few words here. It is important that each of you live taking care of your health.

It is not surprising that swollen healthcare expenses are reflected in taxes and so on. Today's youth are hard. But, to reduce the burden on such youth, it is necessary that people call to each other as residents living in the same community, enable the elderly to perform a certain level of activities, or try to think that things are not longer someone else's affairs. Such efforts, as a whole, will lead to healthcare cost reduction throughout the entire society. Communities are now just too large and each community has an octopus pot-like structure, which is a characteristic of Japan. People say, "I graduated from XXX university" or "I am affiliated with XXX company". Any community has an octopus pot-like structure and does not know the other communities. The same is true of the government. In the Japanese society, people are not interested in others. So, the same universities or organizations are always asked for opinions as policy advisors.

However, in the United States, which generally has much to do, for example, the U.S. president brings together a wide variety of experts and builds an advisor team for making various policy decisions. The United States has a system in place to destroy some kinds of closed spaces that might be equivalent to octopus pot-like communities in Japan and to create new areas or fields one after another. What surprised me in the United States was that when I was invited to a party and went there one day, people who were invited there were complete strangers to each other. There were politicians, artists, and so on. They enjoyed themselves, calling each other by their first names in a very frank manner, and had a serious discussion. There is no such community in Japan. So we have to go ahead and create it.

As said before, the potential of the healthcare industry needs the entry of people outside the healthcare field. And, in a good sense, it is very important that those who try to serve health develop throughout friendly competition to ensure provision of better healthcare. I think that it will ultimately benefit patients and therefore us. In summary, a shift has occurred from treatment to healthcare. And, it is important that not only healthcare is provided by healthcare providers, but also we consider healthcare in concrete terms or work as a team.

I will take hospitals for example. As some of you may know, our Yokohama City University Hospital is overflowing with patients who no longer want to be discharged from the hospital. What this means is that hospital and clinic cooperation, including intermediate hospitals and general practitioners physicians, does not work. Although it is a blessing that patients think that the university hospital will provide the best healthcare, that is not enough to ensure that patients can get back into society. Ultimately, patients can't live a happy life in the absence of some cooperation with intermediate hospitals and general practitioners.

[Education – importance of awareness]

The most important thing is improvement of health literacy. Patients, including you, need to understand the principle by which healthcare functions. Otherwise, we can establish no efficient

healthcare system. There are discrepancies between healthcare providers and patients in many ways. For example, even if a new drug is born and considered as an excellent drug, I am sure that newspapers carry the article of “occurrence of side effects.” Although the expression of “occurrence of side effects” is used, all drugs have side effects. But, if I say so, mass media certainly say to me, “it’s disgraceful.” Although many people may think that “healthcare should not have errors”, it is impossible to eliminate the possibility of errors, no matter how hard we try. This is the fact. It is essentially necessary to take the fact calmly and discuss what to do.

The next is about life innovation. I think that you have heard “life innovation” a thousand times. It is not so easy to bring innovation. Now, LEDs were receiving attention in Japan so I talk in the context of LEDs. For example, the discovery of penicillin was really innovative because antibiotics can selectively damage cells or bacteria without any damage to our body. This was the discovery of innovative drugs. Although you may easily remember that Fleming was one of the key players of this discovery, the fact is that additional two persons were involved in this discovery. They are Florey and Chain. Fleming could not extract penicillin from blue mold, no matter how hard he tried. It was Florey and Chain who succeeded in it. So, The Nobel Prize in Physiology or Medicine for the discovery of penicillin” was awarded jointly to these three persons. The latter two persons were those who made penicillin available in practice. The same is true of the Nobel Prize for the development of LEDs. The Prize was awarded to the group of Professor Akasaki for developing the principle of LEDs and Professor Nakamura for significantly lowering costs of LEDs and offering them to a market.

Japanese people think too much about which is superior, the discovery or application of this fundamental principle. In other words, professors think that those who discovered principles were greater than those who applied them. I think that is wrong. I’m sure that the involvement of many people makes such innovations happen.

So, academia alone is not enough. Industry is not enough. And government alone is not enough. Industry-government-academia cooperation is needed for these efforts. As you know, big data require operation with management of various kinds of information, including personal information. It is said that there are impacts of a variety of life innovations. I’m sure that I don’t have to tell you this. What I would like you to give most attention to is “negative impacts” associated with more and more promotion of these efforts. No business opportunities will be created unless these impacts are eliminated.

I will give you the best example. Honestly speaking, drug development is actually the field that Japan should be proud of. But, the U.S.A. ranks first, U.K. second, and Japan third. These 12 products for Japan, which are for this fiscal year, have been developed in Japan. But, all the clinical studies were conducted overseas. Overseas people say, “Japan is a free rider.” Japan has been

criticized by overseas people for “conducting experiments on their bodies and just plucking the fruits” for 20 years. “Conduct in the tripartite regions all together” is promoted. As mentioned later, the recent Novartis’s problem with Diovan also occurred in this context.

Although life expectancy is increasing, I actually feel in clinical practice that patients who would not recover before are more likely to recover. Many people died of hypertension or stroke in the past, but the development of antihypertensive drugs or early cancer detection has made more patients recover. This is due to benefits from drugs. However, clinical studies are slow, as shown here. This is due to problems of conflicts of interest. Clinical studies take quite a bit of money. Collusion between providers of this money and investigators is absolutely a conflict of interest. Various measures are necessary to wipe out this collusion. In Japan, a Japanese NIH has been established at last. We should watch the future development of it, towards which we have to devote effort.

I have developed a variety of activities in Yokohama City University. Put simply, I feel that “universities should contribute more to society” or that “universities should make contact with society.” Originally, study field was not subdivided. In ancient Greece, philosophy was the only study. The study of how human beings can be happy has been divided into more and more specialties. I am aware of the need for the fostering of human resources that can make an integrated decision while having a specialty. And, life innovations are nothing but social innovations. I’m sure that it will not work in the absence of this basic idea, although I agree that healthcare is a growing industry. No acceptance from the public will be gained. After all, I’m sure that no healthcare business will work in the absence of a thorough public understanding of “clinical studies being conducted for the benefit of the public.” I would like you to understand this at all costs. Michael Porter, who is famed for Corporate Strategy, notes the importance of shared values between companies and the society and says that the values that companies think of as important should be consistent with the values that the society thinks of as important. I think that companies are the very social contributions, so I do want support from you. And, it is very difficult to do all things and thus it is necessary to step up individual small efforts. And, it is also necessary to share values and goals and have a public debate.

We, on the university side, would like to make an appeal that a sobering awareness is important for education. Although I return back to the initial thesis of “what is happiness?”; some people feel “happy” and others feel “unhappy” even in the same setting or environment. Education that makes people feel “grateful” about things is important. Excuse me for mentioning something personal, but I love climbing mountains and belonged to the mountain climbing club in my university years. A motivate of climbing mountains is as follows. Excuse me for telling juicy stories, but I start to miss various things tremendously when I climb a mountain over 10 days or so. For example, I will want to drink a cool beer, eat a watermelon, eat my fill of delicious foods, take a bath, and so on. After I descend the mountain, I can get all of such things. But, if I do not climb a mountain, I’m sure that

watermelons or beers do not have such values. In other words, where we feel happy may vary greatly depending on a certain kind of awareness, education, and understanding of “what is a blessing” or “what healthcare looks like.” In that way, education and awareness are important.

Thank you for your attention.

End

Profile of the lecture:

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