New Breeze

Quarterly of the ITU Association of Japan

Special Feature

Regional Revitalization Through ICT

Using ICT to Transform Emergency Healthcare in Provincial Japan/ *Forestyle*: Web Marketing Strategy Exploiting Mountain Trees and Contractors/ *Pocket Karte*: Service for Managing Individual Healthcare, Medical, and Welfare Histories

Report

48th Celebration for World Telecommunication and Information Society Day (WTISD)

Letters to *New Breeze*

New Breeze welcomes readers' opinions. Please send comments with your name, address, and nationality by e-mail, fax, or post to the editor.

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C O N T E N T S

About the ITU-AJ

The ITU Association of Japan (ITU-AJ) was founded on September 1, 1971, to coordinate Japanese activities in the telecommunication and broadcasting sectors with international activities. Today, the principle activities of the ITU-AJ are to cooperate in various activities of international organizations such as the ITU and to disseminate information about them. The Association also aims to help developing countries by supporting technical assistance, as well as by taking part in general international cooperation, mainly through the Asia-Pacific Telecommunity (APT), so as to contribute to the advance of the telecommunications and broadcasting throughout the world.

Regional Revitalization Through ICT

Regional Communications Development Division
Information and Communications Bureau
Ministry of Internal Affairs and Communications

1. Role of ICT in regional revitalization

1.1 Overcoming population decline and revitalizing the local economy

After Japan's population peaked in 2008 at 128.08 million, the population has continued to fall, and according to median estimates is expected to reach 86.74 million by 2060. This sharp decline is attributed to ultra-low fertility rates in major cities, outflow migration from rural areas into the cities, and a number of other factors. To deal with these challenges, Japan will attempt to reverse the population decline by neutralizing the excessive concentration of population in the Tokyo Metropolitan area and by offering policies that fulfill the hopes of young couples for marriage and child-rearing, while seeking to restore the rural economy with a range of initiatives under the rubric of overcoming population decline and revitalizing the local economy.

An Overcoming Population Decline and Revitalizing the Local Economy Headquarters was established on September 3, 2014 with the explicit goal of promoting these initiatives and creating autonomous and sustainable communities that fully exploit the special attributes of each local area. This was followed a few months later with a new basic law, the "Overcoming Population Decline and Revitalizing the Local Economy Act," that was enacted by the Diet on November 21, 2014.

A "Special Committee for Regional Revitalization" was convened in the Lower House on October 22, 2014 while this bill was making its way through the legislative process, and committee members stressed the importance of ICT and building a viable ICT infrastructure, and again recognized the importance of ICT for regional revitalization.

1.2 Overcoming population decline and revitalizing the local economy: Long-term vision and comprehensive strategy

On December 27, 2014 two basic policies were approved by the Cabinet Council, the "Overcoming Population Decline and Revitalizing the Local Economy Long-Term Vision" (Long-Term Vision), a proactive vision of what can be done to reverse Japan's falling population, and the "Overcoming Population Decline and Revitalizing the Local Economy Comprehensive Strategy" (Comprehensive Strategy), a five-year strategic plan for dealing with the country's population woes and revitalizing the local economy.

The long-term vision encompasses three basic goals that will sustain the vitality of Japanese society into the future and help reverse the sharp decline in population: (1) to relieve the excess concentration of population and industry in the Tokyo Metropolitan area, (2) to provide incentives for young people to marry and have children, and (3) to overcome and resolve the specific issues faced by different local communities.

And if we can somehow reverse the downward trend in population, this would have a rejuvenating effect on the overall population structure. Communities that are able to revive their populations would have younger people would have richer resources available in that community, and this would give rise to new

■ Photo: 2014 Rural ICT Excellence Awards . Scene at the awards ceremony.

innovative ideas by exploiting ICT. Moreover, this would lead to a resurgence of vibrant local communities in which ICT plays a critically important role in regional revitalization.

In order to pave the way for Japan's long-term vision of "sustaining the vitality of Japanese society into the future," a comprehensive strategy is called for. The comprehensive strategy consists of four basic goals: (1) creation of stable employment opportunities in rural areas, (2) creation of incentives for people to move into rural areas, (3) creation of incentives for young people to marry and have children, and (4) additional regional development that reflects the times.

The comprehensive strategy also provides support measures needed by local communities to develop and implement their own "local comprehensive strategies," and "IT policy packages" are provided to support each of these basic goals. Here again, because ICT is unconstrained by time or distance, it is perfectly positioned to create innovation and new industries that fully exploit the originality and ingenuity of local communities. Because ICT can stimulate local industry, sustain and improve local services, and support flexible work environments, ICT is especially well suited to provide greater efficiencies across a great range of different fields including medicine, education, employment, politics, agriculture, and others.

More specifically, ICT is critically important for implementing a host of local initiatives such as telemedicine and distance learning, development of communications and broadcasting environments that support local socio-economic activities, leveraging ICT for new urban development and dissemination of regional information, to open up new telecommuting opportunities and other flexible working arrangements.

In terms of boosting the competiveness of local industries, another policy is designed to promote tourism by creating a more congenial environment with free public wireless LAN services, and in terms of accelerating local immigrations and increasing local jobs, one more policy is designed to promote *Hometown Telework* so people can live in rural areas and work in satellite offices.

In addition, a range of other initiatives have been described that leverage ICT to promote regional revitalization—a local version of the Cool Japan campaign that supports the dissemination of information promoting local tourism, local special products, and the like through overseas broadcasts, dissemination of Geospatial Information (Advanced Geospatial Information Utilization Society), an early-detection L-Alert system (Disaster Information Sharing System), and so on—so obviously ICT has a critically important role to play in regional revitalization.

Note that when settling upon regional comprehensive strategies, it is incumbent on prefectures and municipalities that they make a sincere effort to draft their provisions (deadline was the end of March 2016) in line with Articles 9 and 10 of the "Overcoming Population Decline and Revitalizing the Local Economy Act," and that they take the countrywide comprehensive strategy into account in implementing their local strategies. In fact, many rural communities that have enacted local-version comprehensive strategies based on ICT measures have been studied, and it is apparent that ICT-driven regional revitalization is a major challenge in rural districts as well.

1.3 Basic policy on overcoming population decline and revitalizing the local economy 2015

A "Basic Policy on Overcoming Population Decline and Revitalizing the Local Economy" (Basic Policy) was approved by the Cabinet Council on June 30, 2015, which not only spells out the direction of strategies and measures for the rest of FY 2015 but, with some minor revision of strategies at the end of the year, the direction of initiatives and strategies for next fiscal year and beyond.

As the circumstances surrounding local revitalization have become increasingly tough, the Basic Policy is intended to draw out the earning power, the total collective strength of communities, and the knowhow and wisdom of the people to achieve Abenomics at the local level, and constructing new frameworks, leaders, and spheres are all critically important to extend and deepen regional revitalization.

In order to amplify regional revitalization, the Basic Policy highlights more specific ways of thinking and things that need to be addressed in line with the four policy goals upon which the comprehensive strategy is based.

Especially regarding ICT, bold sustainable initiatives proposed by local reform-minded governments were supported across the country based on the "Plan to Promote IT Use for Regional Revitalization" that was enacted the same day by the Strategic Headquarters for the Advanced Information and Telecommunications Network Society (IT Strategic Headquarters, June 30, 2015) as an effective program for stimulating local industries and boosting the quality of life in rural areas.

Recognizing that IT can provide effective solutions to the various challenges faced by rural communities, the "Plan to Promote IT Use for Regional Revitalization" ("Plan to Promote IT Use") outlines strategies for local governments to actually deploy IT and presents policies and measures for improving the effectiveness of IT. The "Plan to Promote IT Use" not only helps define and implement "local comprehensive strategies" drafted by local governments to deal with local problems, it also promotes regional revitalization through IT by pushing measures that are detailed in the plan through close cooperation between governments at the local level and at the national level.

The "Plan to Promote IT Use" aims to promote IT use for regional revitalization throughout the country by focusing on three specific initiatives and measures: (1) deployment of information-sharing platforms that promote use of IT by local governments, (2) better support for human resources for local government and revitalization of local industry, and (3) break down barriers that hinder use of IT in rural areas. The goal is that by promoting these measures throughout the country this will establish a benevolent cycle that reverses the falling population trend and vitalizes the local economies of reform-motivated local governments to enhance the quality of living conditions and revitalize local industry, and we expect to see the benefits or regional revitalization by the year

2020. Moreover, by sharing the results of these bold IT initiatives throughout Japan, this will lend support to the overall revitalization of Japan's economy.

2. ICT-based regional revitalization initiatives

2.1 Dissemination of regional digitization best practices

It should now be apparent that ICT has an enormously important role to play in Japan's regional revitalization. Japan's Ministry of Internal Affairs and Communications (MIC) has already conducted many regional ICT projects and trials to assess how effectively ICT can deal with the issues and challenges faced by Japan's rural districts. These initiatives have proven quite effective for addressing local problems, for training personnel who can solve problems using ICT, and for promoting regional revitalization.

We have already seen several cases in a number of different areas where the results of a local ICT project have been successfully transferred to another community where the innovations worked just as well. Since many local communities face similar problems in trying to revitalize their economies, it's important to identify successful ICT solutions that help resolve common problems and transfer those solutions to other communities as quickly as possible.

With this idea in mind, the MIC is moving quickly to disseminate ICT project success stories to other communities as best practices that might be adapted to solve similar problems in other areas. To do this, the MIC sends out ICT utilization advisors to communities with similar problems, offers a range of tools for disseminating information including websites and DVDs, and hosts seminars on how local communities might capitalize on ICT.

A number of ICT projects are now underway in different rural areas throughout the country in an effort to solve some of the problems faced by rural communities: falling population, low fertility, poor economic prospects, shortage of physicians, lack of disaster preparedness, and so on. With the goal of disseminating the best ICT-based models for regional revitalization, the MIC has been screening advanced regional digitization success stories from around the country to identify those that are especially commendable, and established the Rural ICT Excellence Awards in 2014 as a way of recognizing the projects that are most conducive to regional revitalization. A total of 94 projects were submitted in the first year, and 13 projects were singled out by a screening panel made up of experts in the field to receive the prize.* The following four prize-winning projects are featured in this special issue.

① Grand Prize, Minister of Internal Affairs and Communications Award, Pocket Karte and a smart ID card for regional healthcare (NPO Sustainable Community Center Japan, Kyoto)

Pocket Karte is a personal medical record archive service that enables users to store their records in the cloud, keep track of medical records and prescriptions via smartphone, cable TV, or other device over the Internet, and share those records with doctors and hospitals. The smart ID card gives users the ability to make appointments and meet with doctors at all local clinics and hospitals that accept the card and supports an efficient, care-free healthcare environment for local residents.

② Grand Prize, Minister of Internal Affairs and Communications Award, Forestyle website offers the benefits and vibrant life of the forest (Village Office of Higashishirakawa, Gifu Prefecture)

Forestyle is a dedicated one-stop website that connects customers in the village or on the other side of Japan with foresters and builders who can handle the entire process of harvesting trees, designing, and building quality homes using locally grown hinoki cypress. Forestyle has produced a dramatic uptick in orders for new homes and revitalized the entire agricultural sector of the village with a so-called *sixth-order* industrialization solution that combines growing (primary industry 1) with processing (secondary industry 2) and distributing and selling (tertiary 3) to produce remarkable synergies (1 + 2 + 3 = 6).

③ Community Revitalization Section Prize, the *Satellite Office Project* that has completely transformed Japan's countryside into a congenial place to live and work (NPO Green Valley Inc. of Kamiyama Town, Tokushima Prefecture).

The *Satellite Office Project* created new employment and brought people into this formerly depopulated area while introducing new ways of work and breathing new life into Kamiyama by deploying a high-speed broadband environment throughout the town, by building satellite offices in the area, and by enticing ICT venture firms into Kamiyama.

④ Special Award, Wildlife damage control by sensor network (Shiojiri, Nagano Prefecture)

A system with a sensor network has been developed that detects animal intrusions into cultivated areas and villages. This drives them away quickly with loud sirens or flashing lights, or contributes to help capture them by sending messages and maps to local farmers and hunting clubs. The results of a two-year trial show that areas damaged by wild animals consequently has been dramatically slashed from 85% to near zero.

We are continuing this tradition of awarding prizes, and a new slate of innovative projects has received the prize for 2015.

2.2 MIC's ICT regional revitalization budget FY 2016

The MIC has appropriated funds out of its FY 2016 budget to support various ICT-related regional revitalization activities. Here we will briefly consider three areas where funds have been allocated.

(1) Projects to promote ICT overcoming population decline and revitalizing the local economy (¥250 million)

The MIC is subsidizing regional revitalization by covering initial investments and costs associated with ongoing system maintenance (spending on equipment, costs for collaborative meetings required to build and maintain systems) enabling local governments and businesses to adopt new technologies derived from "ICT town" trial projects and advanced regional digitization success stories (successful models). Projects include wildlife damage control using a sensor network, sharing forestry resource data in the cloud, and digitization of maternal and child healthcare data using the "Individual Number Card."

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* The winning projects for 2014 were announced on January 22, 2016. http://www.soumu.go.jp/menu_news/s-news/01ryutsu06_02000103.html

(2) Tourism/disaster prevention Wi-Fi station maintenance project (¥260 million)

To deploy a free public wireless LAN infrastructure, which is a pressing need among foreign visitors to Japan, the MIC is assisting with a portion of expenses for a local government project to deploy public wireless LANs at tourist destinations and disaster prevention facilities to promote regional revitalization. A Wi-Fi enabled mobile environment would be most convenient for foreigners and other visitors at tourist destinations.

(3) Subsidiary project for overseas distribution of broadcast content (¥225 million)

MIC encourages private business operators who produce broadcast content to collaborate with other industries (tourism, local industry, content providers) and local governments in the production and overseas distribution of content furthering the "Cool Japan," "Visit Japan," and "Regional Revitalization" campaigns while also supporting integrated development of various other cooperative projects.

(4) *Hometown Telework* promotion project (¥720 million)

MIC is subsidizing the introduction costs for local governments throughout Japan to introduce *Hometown Telework* that encourages workers to seek employment with companies located in rural areas and promote rural telework environments that are on a par with employment in larger cities. To ensure rapid dissemination of the telecommuting model, additional support is provided to conduct an enlightenment campaign by dispatching experts, holding seminars, and providing corporate telecommuting deployment adviser training sessions.

3. Conclusions

The MIC's 2015 White Paper on Information and Communications in Japan goes into some detail about the role ICT is expected to play in regional revitalization of Japan. Assuming that regional companies will continue to adopt ICT solutions in the years ahead and that regional offices will employ ICT to the same extent as regional ordinance-designated cities, the White Paper is able to verify how much employment is likely to increase in the future. Based on these findings, we can anticipate further growth of existing businesses and an influx of new companies, which will be accompanied by an estimated increase of roughly 200 thousand additional employees.

Based on this estimate, since ICT is not constrained by time or distance, we envision that ICT will create innovation and bring new industries that exploit the originality and ingenuity of local communities. While not mentioned among the prize-winning projects described earlier, local governments are currently working on three novel projects that exhibit extraordinary originality and ingenuity, and will be featured in the next special issue.

(1) Emergency patient transport system (Saga Prefecture)

By creating an emergency medical data system in which data can be entered into a tablet computer in the ambulance in real time—verifying which hospitals can accept the patient, obtaining medical records for the patient being transported, systematizing the preliminary findings of the medic or doctor who first examined the patient—then sharing this information with the medical staff at the hospital, emergency transport time can be markedly reduced, congestion at the hospital can be alleviated, and other benefits realized.

(2) Improvement of forestry productivity (Maniwa, Okayama Prefecture)

A cloud-based system has been developed that manages tree distribution data obtained from landowners and robotic sensors in radio-controlled helicopters and tree growth data on the cloud, that enables users to share this forest resource data with the local city office and forestry cooperative. Before this system was available, it took two staff members a full day to assess each parcel of forest resources, but now the work time has been dramatically cut to about one minute of simple on-screen manipulation on a personal computer.

(3) Fukuoka City Wi-Fi (Fukuoka City, Fukuoka Prefecture)

This new free Wi-Fi service is available to anyone at hubs installed at transportation and tourist sites. Providing tourist information in different languages, simple authentication, and international roaming, this is the first time that such a service has been made available in Japan. Local residents and tourists alike are encouraged to take full advantage of the service, which should promote tourism and the creation of innovative new businesses.

It will be apparent from these three new technologies that there is a very close affinity between ICT and regional revitalization. By promoting even more effective utilization of ICT, the MIC is seeking to create a benevolent economic cycle that will bring about regional revitalization.

Cover Art

Nan'eki ha-jirushi Ha, of the Southern Station (Woman Relaxing after Her Bath)

Kitagawa Utamaro (1753-1806)

Using ICT to Transform Emergency Healthcare in Provincial Japan

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1. Introduction

What comes to mind when you see the term "Regional Healthcare × ICT"?

In this article, I will introduce an example of an ICT application in the arena of emergency healthcare. Emergency healthcare is a battle against time, where matters of minutes or even seconds can mean the difference between life and death. This area of healthcare is perhaps the one where workers in the field are exposed to the harshest conditions. I thought perhaps these workers could be using ordinary common-or-garden terminal devices such as smart phones and tablet PCs.

In this article, I'd like to describe how Saga became the first prefecture in Japan to start working on the use of ICT in the emergency medical field in April 2011. The sharing of information is an essential requirement in many different fields, including emergency healthcare. I hope this article about what we are doing here in Saga prefecture helps to raise awareness not only in the field of emergency healthcare but also in other fields and other industries.

2. Background to the introduction of ICT in the emergency healthcare field

Back in 2010 when I first became responsible for emergency healthcare, it was commonplace ambulance crews in Saga prefecture to phone around several hospitals in order to find a hospital able to accept a patient. Sometimes this turned out to be quite difficult, and patients would be sent on from one hospital to the next. This had become a major social issue not just in Saga prefecture but all over Japan. (Appendix 1)

With no prior knowledge of emergency healthcare, I found myself facing these dangerous circumstances, and felt that the first thing I needed to do was experience for myself the issues faced by actual ambulance crews. Otherwise I would be unable to formulate effective policies. A hands-on approach is an important element of human resource development in Saga's prefectural government, and it is the approach I take when starting any new job.

I therefore took this valuable opportunity to ride along with ambulance crews during their actual work shifts, listen directly to the doctors that save lives in the emergency medical centers to which these ambulances bring their patients, and observe the actual flow of patients through the ambulance system. By witnessing the front line of emergency healthcare, I got to see how ambulance crews use their mobile phones when making urgent decisions about where to take patients, and how doctors are beset by a continuous succession of calls from hotlines asking them to accept patients arriving by ambulance. Typical tasks they have to perform include finding out which hospital is currently able to accept a patient, finding out how many ambulances have been called out, and where they have been called out to, and finding out how many patients have been accepted by which hospitals. To get this information, they have to make calls from their mobile phones inside the ambulance while the medical institutions respond on their dedicated hotlines, while all the time doing their best to keep the patient alive. I felt that information was not being adequately shared between ambulance crews and medical institutions. If we can make it possible to visualize the scene of an emergency, then this could help to improve the current situation. I saw for myself how medical institutions continue to reject phone calls asking for emergency patients to be admitted, and the difficult conditions of ambulance crews who have to continue desperately making calls to medical institutions, and felt strongly that ICT could provide technology to change this situation.

We constructed a system funded by a grant from the Ministry of Internal Affairs and Communications for ICT-related human resource development and business applications aimed at promoting healthcare in provincial regions. The system design, screen layout and the like were arrived at through a series of meetings with a committee of fire department workers and ambulance center directors. The development proceeded at a rapid pace through a hands-on approach aimed at developing a system that would be useful to people working on the front line of emergency care.

■ **Document 1: The current difficulties of Japan's emergency healthcare**

(1) Number of patients transported by ambulance
(All Japan)	2000: 3.997 million	⇒ 2013: 5.340 million (highest ever)
(Saga prefecture)	2000: 220,000	⇒ 2013: 320,000 (highest ever)

(2) Time taken for patient to reach hospital after dialing the emergency number (119)
(All Japan)	1999: 27.1 minutes	⇒ 2013: 39.3 minutes (highest ever)
(Saga prefecture)	1999: 27.8 minutes	⇒ 2013: 36.1 minutes (highest ever)

(Source: "The current state of emergency and rescue services", Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications)

3. Details of the emergency healthcare information network system

In April 2011, we deployed tablet devices in every ambulance in Saga prefecture and started up an information network system connecting these devices. This constituted the Saga prefecture emergency healthcare information system, which is called "99 Saga Net" (Figure 1).

In this system, ambulance crews are able to operate the tablet terminals inside their ambulances to obtain information that would previously have to be collected by phoning around multiple medical institutions.

Twice a day, in the morning and evening, the medical institutions use PCs or the like to enter information such as the availability of specialist doctors into the system. Using their tablet devices, the ambulance crews can access this information to find out what sort of medical specialists are available at each medical institution. Although it may be generally possible to ascertain the admission capabilities of medical institutions within an ambulance's own service area, this system makes it possible for anyone to obtain information about medical institutions even outside the ambulance's service area with a proficiency at least matching that of veteran ambulance crew members. (Figure 2)

Also, each ambulance crew can use its tablet device to record details about the patients they have carried, such as the time of the journey, where the patient was taken, and the nature of their medical emergency. This allows them to check in real time on a map showing how many ambulances have been accepted by each medical institution, and how many have been turned away. (Figure 3, Figure 4)

In addition to this sort of specialized function for use by related individuals when transporting emergency patients, the system also provides services to local residents such as a "my home" registration service that allows them to search for medical institutions in their neighborhood.

4. Effects of introducing the system

Since they have hitherto not known about the circumstances of medical institutions, ambulance crews have spent a lot of time in unnecessary exchanges with these institutions. However, the use

■ **Figure 1: Overview of the "99 Saga Net" system**
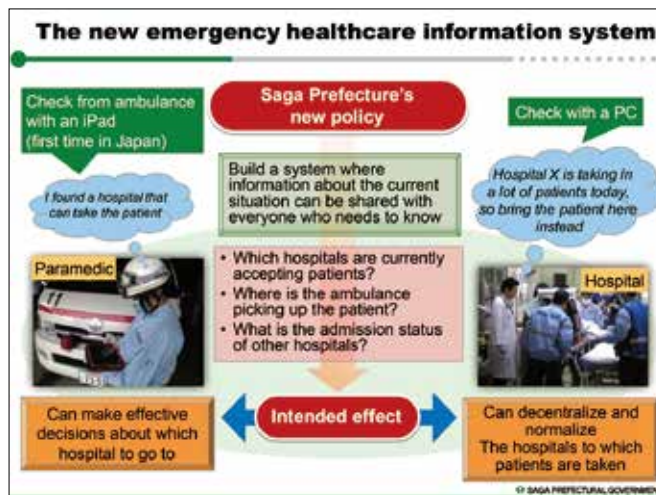
of ICT has made it possible to share information such as which specialist doctors are available at which medical institutions, and how many ambulances each medical institution is able to accept, allowing both sides to understand the situation.

As a result, Saga prefecture was able to reduce its average ambulance transport times for the first time, while transport times continued to increase throughout the rest of Japan. It was also possible to spread around the ambulance destinations by allowing ambulance crews and medical institutions to check for concentrations of ambulance patients at particular medical institutions on the same screen.

It has also become possible to use the tablet devices to convey information that was previously communicated verbally, such as the patient's condition, the amount of blood lost, or the circumstances of a traffic accident, allowing the ambulance crew to visually display the current situation to doctors. This is very useful for making the communication between ambulance crews and doctors go more smoothly.

Regarding issues related to the budget, we reconfigured the existing emergency healthcare information system that had not been used much, and we introduced a cloud service, through

■ **Figure 2: Making the essential information accessible to anyone according to the situation out in the field.**
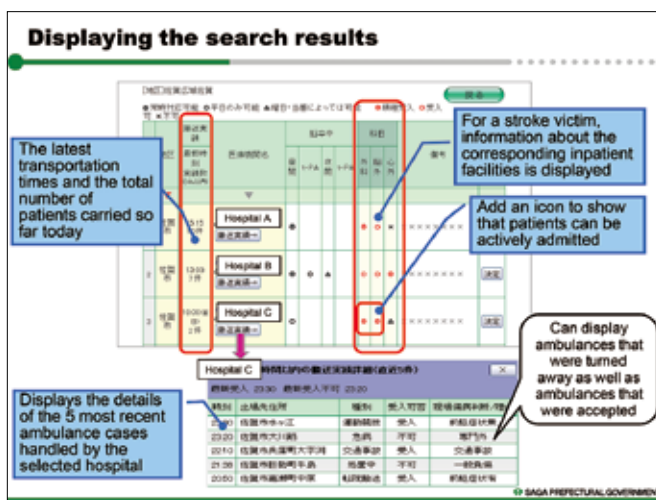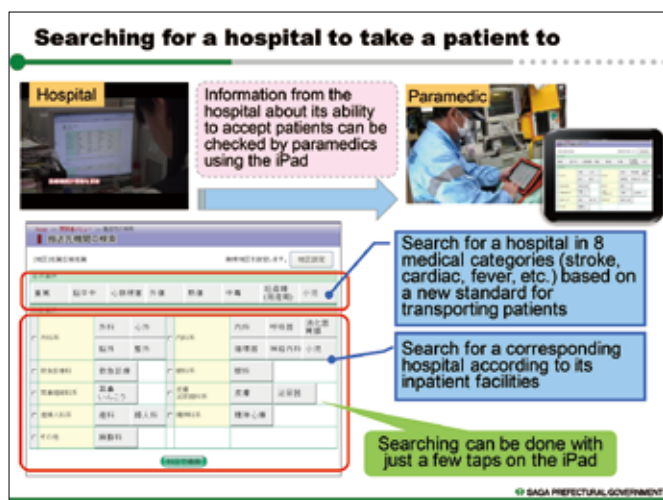
■ Figure 3: Ambulance transport records can be easily entered using touch operations
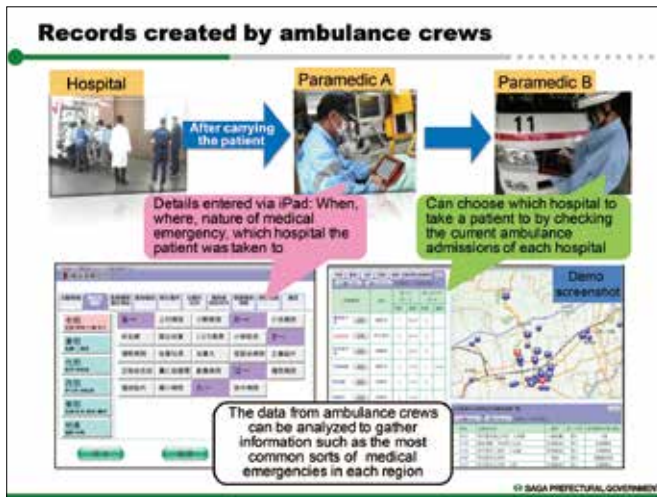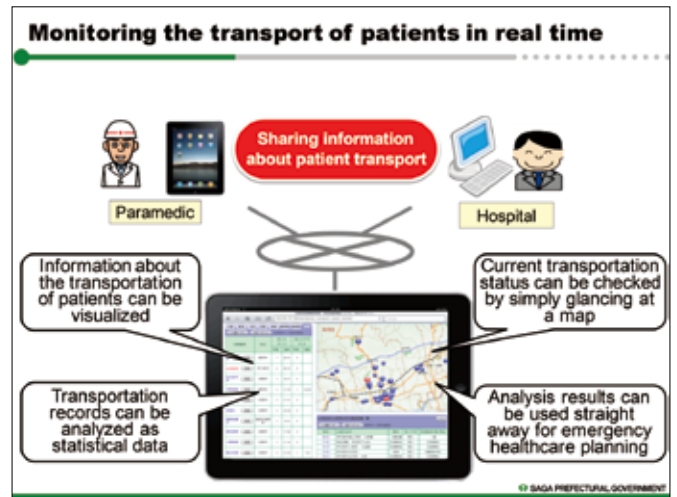

■ Figure 4: Ascertaining the current transportation situation at a glance by sharing transportation records

which we were able to reduce costs significantly. As a result, despite deploying tablet devices in a total of 50 ambulances, we were able to achieve a reduction in running costs of ¥40 million per year. (Appendix 2)

Also, by introducing a framework called MDM whereby it is possible to check on the status of tablet device applications and the like, we made it possible for ambulance crews to have some degree of freedom to install their own applications. Although it is of course necessary to give due consideration to the handling of personal information, the ambulance crews were also able to use applications by themselves in order to resolve issues when out in the field. We also saw a spread in the voluntary use of ICT in the field whereby ambulance crews searched for and used applications to help with their work. These included an application that searches for information about medicines, a translation application to help when transporting foreign patients, and a written communication application to facilitate communication with hard-of-hearing patients. There were also changes in the way ambulance crews worked.

Since we achieved definite results in Saga prefecture, we wanted to expand this use of ICT in emergency healthcare across the whole country, so we have been actively accepting lecture requests from other organizations and publishing media resources, to introduce and describe our work. This project has had a far-reaching impact, and not only won the 2012 MCPC Grand Prix Award but was also awarded the Advanced Governance Award for the best policy at a conference on advanced policy creation held by the National Governors' Association.

In the wake of these awards, Saga has been visited by over a hundred fact-finding groups from organizations such as local councils, regional bodies and medical associations.

Currently, the use of smart devices in ambulances is showing signs of spreading, and as of April 2015, devices for the use of ICT are now being issued as standard equipment in all the ambulances of 10 prefectures. In Gunma and Saitama prefectures, they have even started cooperating by sharing information at the prefectural level across government boundaries.

5. Changing emergency healthcare through data visualization

In particular, since this system was first put into operation, we have collected diverse data related to emergency healthcare, and by analyzing this data, we have been able to visualize issues and aspects of the current situation that have not been apparent before.

■ Photos: An ambulance crew using a tablet device to find out where to take a patient

■ Document 2: The effects of the new emergency healthcare information network

(1) High rate of access to the system
    (Fire) 10,000 accesses   →   110,000 accesses   (11-fold increase)
    (Medical) 25,000 accesses   →   200,000 accesses   (8-fold increase)
    (Residents) 146,000 accesses   →   1,413,000 accesses   (10-fold increase)

(2) One-minute reduction of transportation times
    34.3 minutes → 33.3 minutes (* First 6 months after system's introduction)

(3) Decentralization of medical institutions selected as destinations
    2010: 32.7% →   2011: 29.6%
                    (Percentage transported to critical care centers)

(4) Operating costs
    Approx. ¥67 million per year →   approx. 27 million per year
                    (Including cost of cloud system and tablet devices)

For example, when we analyzed each stage of the time elapsed between a 119 emergency call and the arrival of the patient at hospital, we found that the time between the departure of the ambulance from the scene of the emergency and its arrival at the hospital varied greatly between districts. When this was analyzed in greater detail, we found that the medical institutions were biased towards urban locations, and that one of the challenges of emergency healthcare in Saga prefecture is the large number of cases where the arrival of patients at hospital is delayed in regions without local medical institutions.

Therefore, to improve the quality of emergency healthcare, we started operating an air ambulance in Saga prefecture in January 2014. By using ICT at the site of an emergency to analyze the data from each region, we created a system that supports visualization of the data of each issue and the sharing of this data with related individuals. We are also creating knowledge through a process of cooperative contributions. This has led to major improvements. When we used the air ambulance services of neighboring prefectures, the number of call-outs per year was about 40, but this has now increased to 388 call-outs per year, which has helped to save many lives.

Although there is unfortunately no magic bullet that can solve all of the problems currently facing emergency healthcare, I think we can gradually overcome these problems by creating environments and spaces where it is possible to cooperate with related individuals in the same region so we can find our own solutions.

6. Future prospects — wearable devices, medical treatment

The era of big data is going to bring further changes to the emergency healthcare field. People say that all innovations start to become obsolete from the moment they are made, so we should strive to continue innovating to keep up with the constant changes in the social environment. We will certainly try to do so in Saga prefecture.

Although we achieved a temporary reduction in our emergency transport times through the use of ICT, they started increasing again in the following year. I think this is partly due to the number of emergency patients increasing at a rate that outweighs the benefits of using ICT, and partly due to changes in the reasons why patients are transported by ambulance.

Due to Japan's ageing population, there has been a major shift from patients with external injuries to patients with internal illnesses. It is difficult for ambulance crews to care for such patients without their medical records. This is an unknown social issue that has not been experienced before in any Western developed nation, and since there is no model for us to follow, we have no choice but to figure out a solution for ourselves.

I think that ICT will be more useful than ever in helping us to adapt to these changes in emergency healthcare. Although it is of course important to guard against the leakage and misuse of information, I am concerned that emergency healthcare systems could be liable to collapse if ambulance crews and doctors are expected to carry on making on-the-spot decisions without all the necessary information.

I am still searching around in the hope of finding new forms of medical care in the future.

Accidents and injuries cannot be predicted, but diseases have various indicators. These are things that people may not notice themselves, but it might be possible to detect them in advance by using wearable health management equipment or the like to monitor the patient's pulse rate, breathing rate, blood oxygen concentration and the like. We can visualize the signs of serious illness by combining information about the patient's current condition and prior medical records with medical information derived from big data. If, for example, we could predict that in a certain state of health we will have a heart attack in the next 48 hours with 80% probability, then we would be likely to visit a medical institution ourselves as soon as possible. If remedial steps can be taken before patients fall ill, then they may not require ambulances, and may also avoid the need for surgery and aftercare.

I believe that the utilization of diverse technologies and the cooperation/exchange of human resources across the boundaries between different fields and residential areas will result in beneficial changes to society. In the future, I hope to continue doing whatever I can to improve our future wellbeing.

7. Conclusion

Emergency healthcare in Saga prefecture starts with the observations of individual workers with no prior knowledge of the patient, but extends across the whole prefecture and is even showing signs of spreading across the whole country. We have also received many responses from people all over Japan via social networking services, and we have been told by paramedics and ambulance crew members that they are delighted with the attention that Saga prefecture's emergency healthcare system has been receiving as a result of this initiative. Following the introduction of ICT, we saw an increase in the number of full-time paramedics at each emergency healthcare center as well as an increase in the number of air ambulance operations as mentioned above, and in just four years the emergency healthcare environment in Saga prefecture has been gradually changing.

Perhaps the most important lesson we have learned from our experience in Saga prefecture is that there is no need to accept the status quo if you think there are things that should be changed. Just have a go by yourself and see where it takes you. If people working in the field come up with just one initiative for doing things in a better way, then it could result in the whole of society changing for the better. Rather than referencing specific success stories or businesses, local creation gives people a sense of ownership that encourages them to tackle social issues. But they need the right tools to do this. I think ICT is an effective tool for overcoming social issues.

Reference URLs
The Saga prefecture emergency healthcare information system ("99 Saga Net")
http://www.qq.pref.saga.jp/
"Using ICT to shape the future of emergency healthcare in Saga prefecture"
http://youtu.be/pqK-wNFTgcQ
"Starting a revolution to save lives — Yusuke Enjoji at TEDxFukuoka"
http://youtu.be/PaboSgRcAJg

Forestyle: Web Marketing Strategy Exploiting Mountain Trees and Contractors

Norio Katsuragawa
Section Chief
The Local Promotion Department
Higashishirakawa-mura Public Office, Kamo-gun, Gifu

1. Introduction and Background

Higashishirakawa is a mountain village nestled in the mountains of southeastern Gifu prefecture with a population of about 2,500. Forest lands covers close to 90% of the village, so production of lumber and homebuilding are the chief industries followed by wet-field rice, tea, and horticulture.

These past two decades have witnessed a steady decline of the homebuilding business of the village, falling from a peak of 70 new home orders in 1993 to a dismal 14 orders in 2009, and this has resulted in reduced income for many local residents involved in the construction trade, and this disparity with other towns and villages only continues to widen. The problem is made worse by a steep decline in population after 2003 leading to pessimistic predictions that the village will become a marginal local community by 2023, which is defined as a village where more than half the residents are over the age of 65.

The village finds itself in this awkward situation because it is heavily dependent on just one industry—homebuilding—with roughly 60% of village businesses involved in residential construction, and also because the village has not kept pace with broader changes in society: penetration of the Internet, the rise of manufactured homes, and changing needs of today's home buyers. Until recently, the basic sales approach of village builders was to go after potenial buyers in their 60s and rely on word-of-mouth and referrals, but unfortunately these builders have virtually ignored younger buyers in their 30s and 40s who now make up a major segment of the market.

2. Business Solutions

In order to solve the challenges faced by Higashishirakawa village, it was decided to pursue an ICT-based project that would greatly simplify the process of ordering and building new homes. In order to boost the number of new home orders from village builders that had declined so precipitously, the village office took a leading role in developing a dedicated online site called *Forestyle*

(forest + style), a place where one can order a "custom-built home made of top-grade local timber," that was rolled out in 2010 (URL: http://www.forestyle-home.jp/). The site took special pride in offering a so-called *sixth-order industrialization* solution that combines growing (primary industry 1) with processing (secondary industry 2) and distributing and selling (tertiary 3) to produce remarkable synergies (1 + 2 + 3 = 6).

The project raised high hopes among local contractors who were eager for additional homebuilding orders. Increasing the number of new home orders holds the key, for the industry also supports many subcontractors—companies that fell and ship logs, sawmills, precut mills, and a host of other related businesses rely on home sales. Moreover, improvement in this area promises to bring up local incomes and reverse the demographic challenge of declining population.

Groundwork for the project was laid in 2008 and 2009: a cable TV network was deployed throughout the village, which gave local residents access to data from all across Japan, then the following ICT-based business solutions were implemented to support the project.

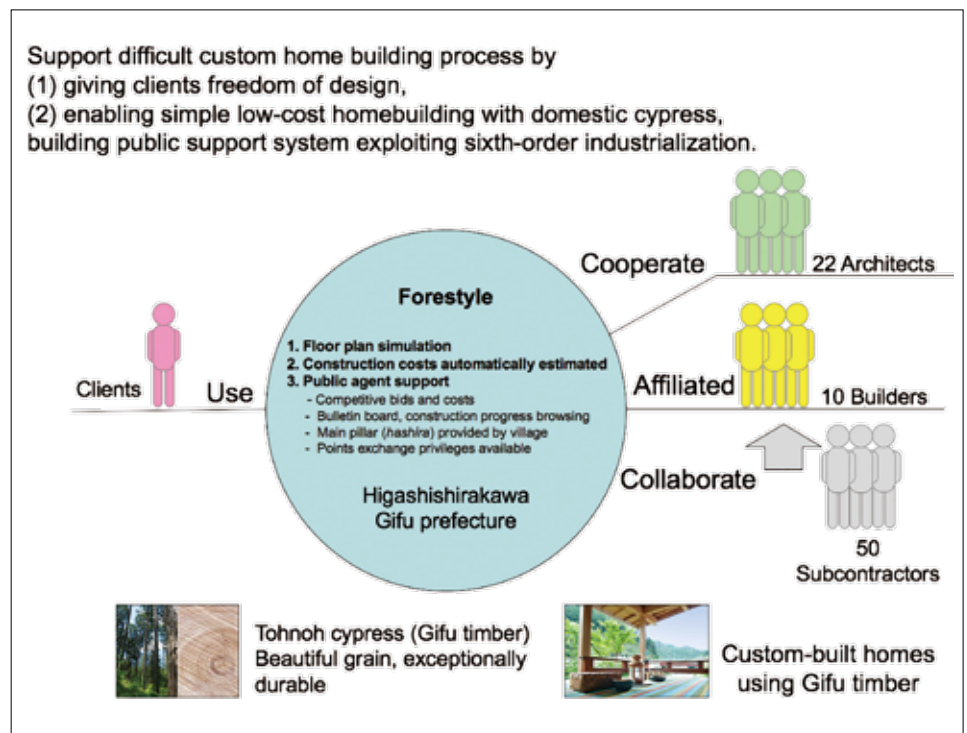■ Figure 1: *Forestyle* organizational structure

Issues	Solutions
Typical clients are getting younger: from 50s and 60s to 20s and 30s.	Created system on the Internet for sketching floor-plan that also displays estimated construction costs in real time.
Custom built homes using top-grade domestic lumber considered very expensive.	
Very small-scale contractors are avoided out of concern they may go bankrupt.	Contractors are backed by the government and local contractors are organized as a group to create a mechanism for price competition.
Client wants custom built home but also wants competition on price.	
Need/demand for traditional Japanese-style home has vanished.	A young architect is include in the group, who is very good at incorporating traditional Japanese design elements.

3. System Features

Floor Plan Simulation

Floor plan simulation provides a way to quickly and easily sketch a floor plan using Internet Explorer or some other browser without having to download any special software. This gives the customer a rough estimate of cost, while letting the supplier offer fair market value for construction based on top-grade local timber. It has always been very difficult when ordering a custom-built home to get an approximation of architectual fees, but the online simulator gives potential clients a rough estimate of construction costs without even having to contact the builder.

Without any special expertise, a customer can define detailed specifications of his or her dream house—the shape of the roof, quality and material of columns, insulation material, and so on—and customize the house to make it resemble exactly what the customer wants.

Agent System

Each builder has his own appoach to contracting and building custom-built homes, and especially if an architect is involved in the process, this adds another layer of complexity that is hard for ordinary clients to understand. Especially for younger home buyers in their 30s and 40s, buying a home is a major once-in-a-lifetime investment and causes tremendous anxiety. *Forestyle* offers an advisor, a neutral third party, who works with potenial buyers to set their minds at ease and help them get through the process of buying a home without experiencing buyer's remorse. Staff from the village office serve as the neutral advisor; they provide agents for potential buyers who set up interviews, obtain and explain cost estimates, and provide any other information that might be required.

User Categories

Users who access the site are divided into four different categories depending on their degree of interest or commitment: *Web Users*, *Members*, *Members PLUS*, and *Construction Users*. One can become a *Member* by simply entering his or her e-mail address and creating a password, and this gives members full access to the floor plan sketching system while preserving their anonymity. *Members PLUS* show a greater degree of commitment by providing their personal information and specific details about the type of house they are considering buying. Finally, *Construction Users* are fully committed: they have signed a contract and work is underway on their home-building projects. These users can follow the progress of work by logging onto the construction progress schedule on their individual pages at the website.

■ Table 2: Privileges for each category of user

Access / Category	Web Users	Members	Members-PLUS	Construction Users
Display floor-plan, construction cost estimates	○	○	○	○
Save, modify floor-plans		○	○	○
Member's own page (bulletin board)		○	○	○
On-line architectural consultation		○	○	○
In-person architectural consultation			○	○
Consult Construction Progress Schedule				

■ Figure 2: Simulation drawing

Layout name: My hideout
Handle name: Taro
Times this plan has been used: 284
Building specification: Forestyle Standard
Executed: March 10, 2016

1st floor 34.78 m² The whole floor space 67.9 m² Building cost ¥16,572,680 Carbon fixation 3.52 t

4. Project Success

Over the five-year period from 2009 to 2013, the *Forestyle* project generated orders for 118 homes, which is equivalent to about ¥3.1 billion in sales. While most of the orders came from the Chukyo region centering on the city of Nagoya where the village is located, two orders came from as far away as Tokyo. Over the same five-year period, the volume of locally sourced cypress (*hinoki*) increased by about 48%. Net sales for *Forestyle*-related operations increased by roughly 70%, which boosted the per capita income of residents of the village by about 16%.

Based on the primary features of the project—trustworthness of *Forestyle* as a public-private collaboration, and transparency of construction-related costs—the system has done extremely well: the number of clients is sharply up, the number of custom-built home orders has recovered (the number of orders has grown by 85% since *Forestyle* was made available), and this has contributed significantly to job security and income stability of the local residents.

During the five-year period from 2003 to 2008 before *Forestyle* was rolled out, Higashishirakawa village experienced a precipitous *downward spiral* (the blue inner circle in Figure 4), and no amount of individual initiative or effort seemed able to reverse the trend. Promotional measures for local governments typically focus on incentive grants, on-the-job training for contractors, and similar initiatives, but these kinds of indirect support are seldom effective in helping an industry recover that is already in decline. The *Forestyle* project adopts a more direct approach of simply increasing the amount of work and seeks to achieve a *sustainable spiral* (the pink outer circle in Figure 4). While this approach takes longer, one can see that the economic conditions in Higashishirakawa village have clearly started to recover.

5. Conclusions: Future Prospects

The goal of this project is not simply to increase the number new home orders, for the contractors support a fairly large number of subcontractors which cannot simply be discarded. Rather, the objective is to evolve into a local industry leader that grows into a sustainable operation meeting current needs to increase employment, stabilize population growth in the community, and even contribute to moderate population growth.

In 2014 having received the *Village of the Year Award* for the third time in a row and the Regional Information Award from the Ministry of Internal Affairs and Communications (MIC), the *Forestyle* project has attracted considerable interest. With people turning to the Internet for information more frequently and
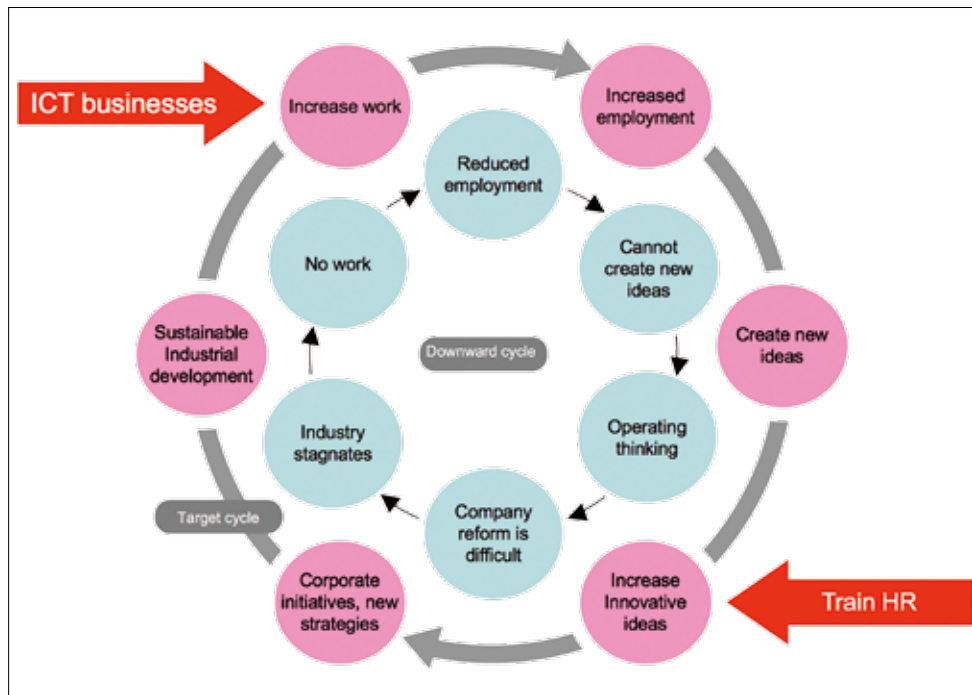
■ **Figure 3: System drawing**
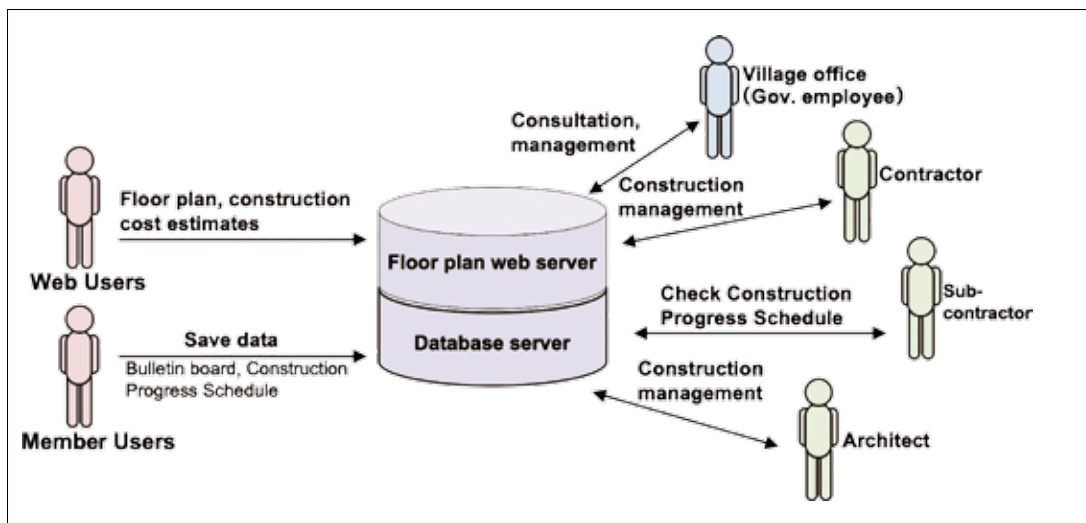
■ **Photos: Example of home and architecture**

■ **Figure 4: Goal-oriented spiral**

some people actually visiting Higashishirakawa for themselves, the village itself is attracting fans. Some of these fans may be *Construction Users* to have commissioned custom-built homes made of top-grade domestic timber.

The project is currently growing at a healthy clip, but the consumption tax and other factors adversely affect new home construction orders, so we must seek ways to strengthen *Forestyle's* appeal. Moreover, if the project achieves the beneficial effect of actually increasing the local population, this will raise other issues such as how to retain younger people to take up local jobs and raise families in the village. In the years ahead, we must move beyond government support, step up and let the private sector—contractors and builders—assume the leading role for expanding and growing *Forestyle*.

Finally, we would note that at the top of the *Forestyle* website, there is a declaration that *Forestyle* intends to donate the *Forestyle* system to "everyone in the local government and village construction industry."

The *Forestyle* system (including the *Forestyle* website, the wood home yen simulator, the wood home database, etc.) is a 2008-2009 regional ICT model construction project web system for promoting online orders of custom-built homes managed by Gifu prefecture Higashishirakawa village under contract with the Ministry of Internal Affairs and Communications.

In districts where residential construction using local materials is the mainstay of local industry, we are now in a period when changes in construction needs are having an immense impact on regional income and population structure.

As a local government facing this exact dilemma, Higashishirakawa village plans to turn over the *Forestyle* System to the local housing and construction organization.

While putting local government employees in the role of intermediary has proved rather cumbersome, it has achieved some positive results similar to when NPO and labor union employees are used as intermediaries. Moreover, since the system itself is deployed in the cloud, *Forestyle* can be rolled out with minimal system development costs or investment in equipment.

Thanks to the efforts of my colleagues and much synergistic energy, I sincerely hope that we can build a viable network that continues to produce excellent results.

Forestyle **Reference Material**

The following subsidies are provided to cover introduction and maintenance cost project resources for the "Domestic Timber Utilization-based Regional Economic Promotion Project" supported by MIC Regional ICT Model Construction Projects

Introduction project costs

FY 2008: ¥28,531,000

FY 2009: ¥29,370,000

Annual maintenance costs

¥17,156,000 (2013 reported basis)

System management

VISH, Inc. (Nagoya City, Aichi Prefecture)

Governing body

Higashishirakawa Village, Gifu Prefecture
Kando 548, Higashishirakawa Village, Kamo District, Gifu Prefecture, Japan.

Pocket Karte: Service for Managing Individual Healthcare, Medical, and Welfare Histories

Yuki Kitaoka
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National Hospital Organization Kyoto Medical Center
Executive Advisor
NPO Sustainable Community Center Japan

1.Introduction

In order for individuals to enjoy optimum medical and healthcare outcomes they must have access to their own detailed medical histories and development records. Yet it is very rare for people to have access to this data, for most of us rely on medical institutions to maintain our medical records. Now, we, the Sustainable Community Center Japan (SCCJ), a Kyoto-based NPO, have come up with a new scheme enabling ordinary citizens to centrally manage and control their own medical records in chronological order that until now have been managed by various medical institutions. This new personal service, called *Pocket Karte*, is now widely available for free throughout Japan, and gives users the ability to manage their own healthcare, medical, and welfare histories. This paper provides an overview of *Pocket Karte*, describing the approach taken and how the system evolved.

2. Project Background and History

A basic key to promoting regional revitalization is environmental enhancement that improves living conditions, especially healthcare and welfare care of people in the community. Yet we are seeing fewer medical institutions all over Japan even as the medical establishment struggles to provide more sophisticated medical procedures to an increasingly diverse and individualized clientele.

There is a wide range of medical institutions throughout Japan—hospitals, clinics, dispensing pharmacies, and so on—but they are operated by different parent organizations, some private (individual and corporate) and others public and state -supported (national, prefectural, municipal, Red Cross, etc.) institutions, and medical histories of patients are kept and managed separately by these various institutions. This means that when someone goes to see a primary care physician then goes in for an appointment with specialist at a hospital, there is virtually no coordination between the pre-exam information collected by the primary care physician (past medical history, family history, allergies, and the like) and the oral consult information given to the specialist. Doctors end up repeating the same advice and tests which is not only a colossal waste of time and medical resources, but also runs the risk of doubling up on prescriptions which could endanger the patient's life. This calls for a better solution, a new framework enabling individuals to centrally manage their own medical and welfare histories in chronological order to make better use of the medical resources that are available including staff, equipment, and facilities.

In order to address this challenge, common throughout the country, of too few overburdened medical institutions, the NPO Sustainable Community Center Japan (SCCJ) has developed and deployed the *Pocket Karte* project integrating a *Smart ID Card for Regional Healthcare* for managing one's own personal healthcare, medical, and welfare histories and management of local healthcare resources. The end objective of the project is to create one vast virtual healthcare network that links all regional medical facilities into a vast information infrastructure that delivers highest quality, safe, and secure medical and healthcare services to everyone in the community. Currently, as of March 31, 2016, *Pocket Karte* has over 50,800 registered users, and has contributed significantly to the establishment of a safe secure regional healthcare delivery system.

## 3. Project Details and Service Overview

The project has two basic elements or features. The first key feature is *Pocket Karte* itself. Conceived and developed by the author, *Pocket Karte* is a powerful Personal Health Records (PHR) service administered by SCCJ, that provides anyone in the community with the ability to manage their own healthcare, medical, welfare, nursing care and other medical records throughout their lives and free of charge.

Hospitals, clinics, and pharmacies send the medical records of local citizens to their *Pocket Karte* accounts, where the data can be readily accessed and managed by the individuals themselves, and the data is always available in the event of disaster or emergency situations.

The other key feature of the project is the *Smart ID Card for Regional Healthcare*, also conceived and developed by the author. Essentially this is an IC card where you can register ID numbers for medical facilities and your patient ID numbers at those same facilities for up to 30 different medical institutions. Once you have registered your patient numbers on this one card, you can set up appointments without going through a whole stack of cards issued by all the different hospitals. Eliminating the need to carry around a wallet full of cards is especially beneficial for elderly people who commonly have to see doctors on a regular basis.

Pocket Karte is also exceedingly user-friendly. You can access the service by just entering an authentication key, which makes it assessable and easy to use by younger children and older adults who may have trouble operating a computer or smartphone or barcode reader. Cards have been issued to more than 50,000 people in areas around Kyoto and Nagoya, and at the present time (April 28, 2016), some 20,173 cardholders (40% of those issued the card) are using the card to set up their medical visits and doctor's appointments.

■ Figure 1: Comparison of *Pocket Karte* project at initial rollout and today
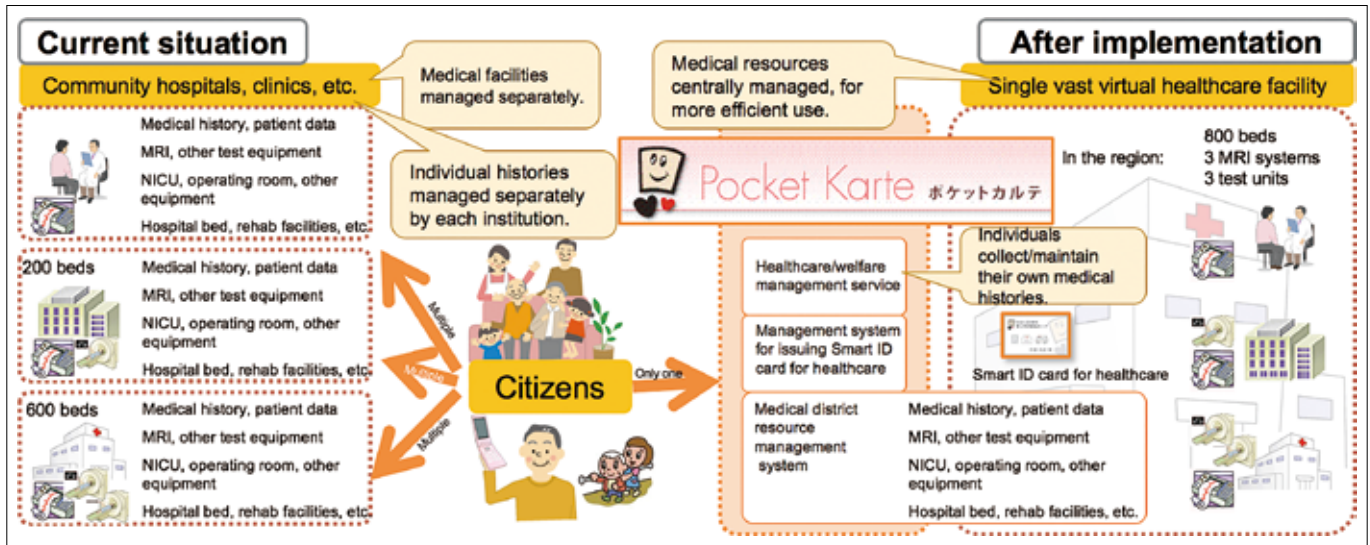
Compared with Electronic Health Records (EHR) and other schemes for sharing medical data between different medical institutions, *Pocket Karte* is unique in a number of respects.

(1) First, *Pocket Karte* is the only system that give people control over their own medical records all through their lives.

(2) Second, data stored on *Pocket Karte* is the life-long history or the life log of actual people, and thus provides a way of evaluating the effectiveness of medical procedures and interventions. *Pocket Karte* data is now beginning to be used as a medical research tool in Ministry of Health, Labour and Welfare research studies to assess and improve the quality of medical outcomes.

(3) Third, once the number of *Pocket Karte* users tops the one million mark, this will open the way for other kinds of studies besides pure medical research to improve the quality of healthcare. *Pocket Karte* could provide invaluable new evidence or a knowledge base for optimizing healthcare costs (healthcare economics), for optimal deployment or training of resources to extend life expectancies (medical staff, equipment, facilities) by analyzing the information as big data stored on *Pocket Karte*.

(4) And finally, for revitalizing local infrastructure, *Pocket Karte* can provide a more fully developed medical environment. It is not only people and jobs that have been leaving rural areas, the medical environment has also suffered in recent years. The data stored on *Pocket Karte* is critically important to extract the maximum benefit from scarce medical resources, and should provide better telemedicine outcomes by giving access to the full medical history of the individual.

Pocket Karte is a kind of *data bank*, where one can store and manage a lifetime of healthcare, medical, welfare, and nursing care historical data at no cost. Likening the service to a bank in the financial sense makes it easier to understand the service. Just as you deposit money in the bank, you deposit healthcare, medical,

welfare, and nursing care historical data (test and lab results, prescriptions, surgeries, hospitalizations, etc.) in *Pocket Karte*. Getting hard-copy medical records from the records department at your local hospital is comparable to withdrawing money from the teller at your local bank. But Internet banking, the basic model for *Pocket Karte*, is more convenient still. Using the *Smart ID Card for Regional Healthcare* to manage your data is comparable to using a cash card to deposit or withdraw money from an ATM machine.

One advantage that *Pocket Karte* has over your bank's ATM machine is that you can peruse your medical data 24 hours a day from the comfort of your own home on your TV set (this only works if you have a cable TV line, as we discuss later). Individual users have access to the *Pocket Karte* service for free, as we have mentioned, but hospitals and other medical facilities pay a modest fee for which they receive some pretty significant benefits. The way it works, *Pocket Karte* continues to operate autonomously and continuously. And by going along with *Pocket Karte*, clinics and hospitals can avoid building and operating their own data systems from scratch and only need to procure the bare minimum of tools.

• Medical facilities: use *Pocket Karte* to share information with patients, and coordinate local healthcare.
• Medical research institutes: use *Pocket Karte* as a database for clinical research and trials.
• Local governments: use *Pocket Karte* to upgrade community services.
• Vendors: use *Pocket Karte* to add value to their services and products.

For implementation and management purposes, a *Pocket Karte Smart ID Card for Regional Healthcare* Committee was set up and meets on the third Thursday of every month (62 meeting have been held so far as of October 8, 2015). The meetings are open to mayors and other government leaders of Kyoto Prefecture, Kyoto City, Uji City, Joyo City, Kumiyama Town, Ikoma in Nara Prefecture, members of the Consortium for Information Society in Kyoto (organized by integrating the former Kyoto Information Infrastructure Council and the former Kyoto Advanced Information Promotion Council), regional medical associations,

medical institutions, patient groups, community associations, ICT vendors, and others. Individual members of the SCCJ may also sit in as observers.

■ **Figure 2: Service vision and system configuration**
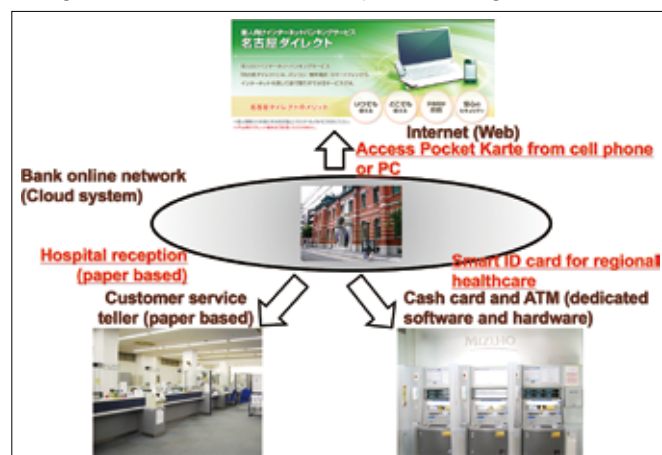
4. Early Setbacks

After a trial version of the service was launched in June 2008, the first official free version of *Pocket Karte* was rolled out a few months later in October 2008. The number of registered users soared to over 100,000 during the first four months, but then the number of new subscribers tapered off. In surveying the users, many complained that "hospitals and pharmacies didn't get the digital data, so I had to enter the data manually one by one, which was a big hassle."

We then came up with the idea of having the hospitals, pharmacies, and other medical establishments print a QR code (a type of matrix barcode) on their receipts, so users could enter the data into *Pocket Karte* by simply using their cell phones, PHSs, or smartphone cameras to read to codes. We call the receipts with QR codes *digital receipts*.

In order for drug stores and medical establishments to implement this *digital receipt* system, they had to upgrade their medical accounting systems and POS register systems, which of course involved some investment. We had to give them an incentive which was potentially more valuable than the cost to upgrading to handle *digital receipts*, and for this we offered more users and more patients.

Similarly, we had to incentivize the patients so they would patronize the pharmacies and medical establishments that implemented the *digital receipt* system. For services covered by health insurance, Paragraph (1) Article 4 of the Rules for Health Insurance-covered Dispensing Pharmacies and Pharmacists (Ordinance of the Ministry of Health and Welfare No. 16 of 1957) provides that according to Article 74 of the Health Insurance Act, patients may receive payment of a partial share of the costs, and this amount cannot be reduced or discounted. For this reason, patients are focused on medical expense deductions.

According to statistics published by the Ministry of Internal Affairs and Communications (MIC) in 2007, average annual insurance costs for households of two or more exceed ¥100,000. This fact suggests a 50% probability that households of two or more are receiving medical expense deductions. But at the same

time, it also means that 50% of households with two are more are not getting the benefit of medical expense deductions. This is because the procedure for taking the deduction is cumbersome and complicated: you have to gather up all your medical receipts for each member of the family over the course of the year and do some complicated accounting. You also have to submit documentation certifying that you are the person who received the receipts. But starting in 2008, one can claim the deduction electronically using e-Tax, and you no longer need to attach actual receipts. Instead, you are supposed to digitize receipts for all healthcare related expenditures, and we have come up with a convenient service for collecting and managing medical expense receipts for all members of the household by simply snapping a photo of the receipt with your cell phone camera.

With the goal of implementing such a system, we applied to develop "a medical digital receipt platform and value-added service for local residents that works together with healthcare household accounts" as one of the MIC's 2009 "ICT Economic and Regional Revitalization Infrastructure Projects (Ubiquitous Zone Projects)." The proposal was adopted in November 2009, and the official rollout of the new service, again available to ordinary consumers for free, took place in February 2010.

Medical expenses include expenses paid to hospitals and other medical facilities that are covered by insurance as well as expenses for other things that are not covered by insurance, such as adult diapers, taxi fare to the hospital, and so on. Since some things are covered while others are not, the author came up with a "healthcare household accounting" system as part of the service that automates the entire process of assembling information needed to take the medical deduction → perform necessary accounting entries → and automatically format the e-Tax form. I would refer the interested reader to the following YouTube video that illustrates how this service works: http://www.youtube.com/watch?v=IAER0i4ZGBk.

In order to promote widespread adoption of the *digital receipt* platform, we had to develop a environment capable of converting a user's medical data (data concerning the purchase of goods and services covered by health insurance such as vaccinations, illnesses and diseases, medical exam results, health foods, favorite foods, over-the-counter drugs, back support belts, and so on) into data that can be readily recorded in *Pocket Karte*. The project to develop a safe secure healthcare, medical, and welfare information infrastructure project by issuing a *Smart ID Card for Regional Healthcare* recommended by Kyoto City, Uji City, Joyo City, and Kumiyama Town was submitted for funding under the MIC's FY 2010 budget allocation for a broad-based regional partnership utilizing ICT, and was adopted. A Management Council was then organized by all the stakeholders who wanted to be involved in the MIC project—local governments, Kyoto, and a host of experts in different areas—and the project was launched as a demonstration service in January 2011 based at the Kyoto Medical Center (Kyoto, Fushimi Ward) and targeting the geographic area composed of the three cities and one town mentioned above (790,000 households).

In addition to last year's deliverable—the scheme for transmitting data to *Pocket Karte* using the *digital receipts* platform and the monetary data (receipts and statements) for determining medical expense deductions—the MIC projects has been

■ **Table: Model of** *Pocket Karte* **Usage**

1. Electronic drug notebook
   ● More than 2,000 pharmacies supported nationwide (as of March 31, 2016).
2. Electronic dialysis notebook
   ● Developed novel electronic dialysis notebook in February 2014 in collaboration with Department of Nephrology, Kyoto University Hospital.
   ● Began providing services to 15,000 dialysis patients through Kyoto Association of Kidney Disease Patients, Osaka Association of Kidney Disease Patients, Hyogo Prefecture Association of Kidney Disease Patients, and Shiga Prefecture Association of Kidney Disease Patients.
3. Electronic healthcare notebook
   ● Developed electronic healthcare notebook in April 2014 in collaboration with Japanese Red Cross Kashiwabara Hospital (Tamba, Hyogo Prefecture). Currently, 12,276 people are using the services (of which 37% are community health exam subjects).
4. Electronic NICU Discharge Notebook
   ● Developed electronic NICU discharge notebook in April 2014 in collaboration with Osaka Medical Center and Research Institute for Maternal and Child Health (Izumi City, Osaka)
   ● On April 1, 2015, began using the discharge notebook to register medical records for all children discharged from NICU as a tool for long-term follow up of these patients.
   ● Committee approved to oversee use of *Pocket Karte* and other tools as monitoring platform for intractable diseases of children by the Japan Pediatric Society, and study expanded nationwide.
5. Cable TV *Pocket Karte*
   ● Rolled out Cable TV *Pocket Karte* service tailored for elderly and rural citizens who are unfamiliar with computer, cell phones, smartphones, etc.
   (1) In October, 2013 launched trial on J:COM Kyoto-miyavision.
   (2) In September 2014, expanded nationwide to include all J:COM group companies (31 companies).
   (3) From March 2015, began rolling out services among cable TV operators in Japan Cable Television Federation.
6. *Pocket Karte* iOS application (medical notebook, medical exam results, medical expense report, medical facility receipts)
   ● (1) Built-in bar code reader makes it easy to read in clinical data
   (2) App is capable of reading both *Pocket Karte* QR codes as wells as Japan Pharmaceutical Association recommended QR code data

broadened to include (1) prescriptions, (2) screening data and results, (3) treatment data, and more. Our solution for dealing with (1) prescriptions is the electronic drug notebook service. This service has been especially well received for its fully automatic recording method that eliminates all the problems associated with conventional paper-based drug notebooks: affixing seals, handwritten transcription, and so on.

Finally, we would note that the use of *Pocket Karte* requires some familiarity with data terminals in the form of camera-equipped cell phones, PHSs, smartphones, bar code readers, or computers. Unfortunately, not all patients or consumers who have doctor's appointments or visit a pharmacy are smartphone or computer savvy. This was the main reason that we brought out the *Smart ID Card for Regional Healthcare* to provide services to those who may be technically challenged. We would refer the interested reader to the following YouTube video that shows an overview of how the *Pocket Karte* was received in the initial service area which includes five hospitals and the Kumiyama town office: http://www.youtube.com/watch?v=w-ISKTvmSvA.

5. Future Developments

The Sustainable Community Center Japan has a saying that "those with money contribute money, those with brains contribute wisdom, and those with neither brains nor money contribute sweat equity!" The idea is that everyone in the community can get involved in projects and help establish the kind of eco-recycling sustainable society that SCCJ and the rest of us desire. Through this project we hope to achieve ongoing and autonomous operations without relying on public funding, to come up with an innovative new business model through expansion of *Pocket Karte*, and to create a virtuous cycle of business expansion (see Table).

The introduction and maintenance costs for this project vary greatly depending on the region, the facilities available, and project specifics. For more detailed information about this project, please contact us at the numbers shown below.

48th Celebration for World Telecommunication and Information Society Day (WTISD)

The ITU Association of Japan

As you are well aware, May 17 marks the anniversary of the signing of the first International Telegraph Convention in 1865. On the day, many countries celebrate it as World Telecommunication and Information Society Day (WTISD).

Amongst them, the ITU Association of Japan (ITU-AJ) marked the occasion by holding the 48th Celebration in Tokyo, Japan, with 300 participants from the Ministry of Internal Affairs and Communications (MIC), the Ministry of Foreign Affairs, and the major players in the Japanese ICT industry. Every year at the ceremony, ITU-AJ gives awards to those who made great contributions and efforts in light of WTISD aims, such as international standardization activities as well as international cooperation in relation to sustainable development goals.

The highest honor, the "MIC Minister's Award," was presented to Dr. Akira Hashimoto of NTT DOCOMO. Many ITU-R friends around the world can recall his successful chairmanship of the Radiocommunication Assembly 2015 (RA-15) last year, which was just a part of his longstanding contributions to the various fields of ITU-R activities.

Also, the ITU-AJ Award for Special Achievement was given to Dr. Miwako Doi of NICT, who made superb contributions to the field of "Human Interface" from software to devices and chips.

This year, as ITU-AJ celebrates its 45th anniversary, Special Awards for Distinguished Service were given to Mr. Gary Fishman, Dr. Yasuo Hirata, Dr. Mitsuji Matsumoto, and Dr. Takehiko Yoshino.

Other awards were also presented to prominent figures in the fields of international standardization and international cooperation, as listed below.

ITU-AJ wishes the winners all the best during their future career paths in the years to come.

The award winners in 2016 are as follows:

MIC Minister's Award
Akira Hashimoto (NTT DOCOMO)

ITU-AJ Special Achievement Award
Miwako Doi (NICT)

ITU-AJ Awards for Distinguished Service
Gary Fishman (Pearlfisher International)   Yasuo Hirata (ATR)   Mitsuji Matsumoto (Waseda Univ.)   Takehiko Yoshino (NHK (Retired))

ITU-AJ Award: Accomplishment in the Field of ICT
Hiroyuki Atarashi (NTT DOCOMO)   Takumi Ohba (NTT)   Yoshinori Ohmura (KDDI / ARIB)   Takatoshi Okagawa (NTT DOCOMO)   Akira Ogawa (NHK)   Ryoichi Kawada (KDDI)   Yoshinori Goto (NTT)   Kimihiro Tajima (NTT-AT)   Nozomu Nishinaga (NICT)   Takahiko Yamazaki (Mitsubishi Electric)

ITU-AJ Award: Accomplishment in the Field of International Cooperation
"King Abdulaziz University HPC System in Saudi Arabia" Project (Fujitsu)   DigiCon6 ASIA Project (TBS)   Masahiro Kamimura (ITEA)

Masaru Someya (KDDI Foundation)
Kenichi Terauchi (BHN Association)
Akira Nagase (NHK Integrated Technology)
Masatoshi Mano (Oki Electric Industry)
Yoshiki Maruyama (ARIB)

Encouragement Award: Field of ICT
Akira Agata (KDDI)   Kenjiro Arai (NTT)   Hiroko Ioka (Fujitsu)   Kazuhito Ishida (Qualcomm Japan)   Wuri A. Hapsari (NTT DOCOMO)   Satoshi Oode (NHK)   Shoichiro Oda (Fujitsu)   Ashiq Khan (NTT DOCOMO)   Tetsuya Kawanishi, Toshiaki Kuri (NICT)   Kei Kawamura (KDDI)   Kunihiro Toge (NTT)   Akihiro Nakao (Tokyo Univ.)   Ryota Mibu (NEC)   Yoshio Miyadera (JRC)   Hitoshi Yabusaki (Hitachi)

Encouragement Award: Field of International Cooperation
Task Force for New ISDB-T Countries (ARIB)   Tomoaki Kanazawa (NTT East)   Kenji Sagayama (Eagle World Development)   Nobuyuki Sato (NHK)   Junji Matsuoka (NHK)   Shigehiko Yasumura (Fujitsu)

Column

= A Serial Introduction Part 4=
Winners of ITU-AJ Encouragement Awards 2015

In May every year, the ITU Association of Japan (ITU-AJ) proudly presents ITU-AJ Encouragement Awards to people who have made outstanding contributions in the field of international standardization and have helped in the ongoing development of ICT.

These Awards are also an embodiment of our sincere desire to encourage further contributions from these individuals in the future.

If you happen to run into these winners at another meeting in the future, please say hello to them.

But first, as part of the introductory series of Award Winners, allow us to introduce some of those remarkable winners.

Digital Broadcasting Experts Group (DiBEG)

Association of Radio Industries and Businesses (ARIB)
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Fields of activity: Promotion of ISDB-T Worldwide

Promotion and Support Activities of Japanese Digital Terrestrial Television Broadcasting System (ISDB-T) Worldwide

The Digital Broadcasting Experts Group (DiBEG) was established in September 1997 to promote ISDB-T worldwide. Digital terrestrial television broadcasting (DTTB) systems are categorized roughly into the Japanese system, the European system, the US system, and the Chinese system. The Japanese DTTB system (ISDB-T) has an advantage in that broadcasting services for both fixed terminals and mobile terminals can be provided by one transmitter so that TV networks can be configured with efficient capital investment. Moreover, the feature of providing broadcast services for battery-operated mobile terminals that can receive broadcasting anywhere and even at the time of any disaster and the emergency warning broadcast system are effective as countermeasures to natural disasters.

As the result of DiBEG active promotion of ISDB-T worldwide in cooperation with MIC of Japan, on the basis of their strenuous comparison test results of the DTTB systems, Brazil decided to adopt the ISDB-T system first outside Japan in June 2006. As of April 2016, ISDB-T has been adopted by 18 countries. For details on ISDB-T adopting countries, see the DiBEG homepage (http://www.dibeg.org/index.html).

DiBEG has also been encouraging the exchange of technical information and international cooperation among ISDB-T adopting countries and extending support to them. For example,

DiBEG has been active in the following activities.
- Technical support to ISDB-T International Forum
- Technical support to ISDB-T adopting countries

The ISDB-T International Forum has been established and regularly held to deal with issues on the harmonization of technical standards and the exchange of technical information among the ISDB-T adopting countries. Under the ISDB-T International Forum, there are three Working Groups: hardware, interactivity & middleware, and the Emergency Warning Broadcast System (EWBS). DiBEG has been contributing to the creation and revision of the ISDB-T Harmonization Documents arranged by each of the WGs. DiBEG has also been supporting and giving advice to the ISDB-T adopting countries to develop their own ISDB-T standards and operational guidelines as well as extending support to JICA technical experts from Japan, who are assigned to those ISDB-T adopting countries to help implement ISDB-T networks.

Additionally, DiBEG recently started study on the next-generation ISDB-T, as Japan and Brazil have agreed that the Japan-Brazil Joint Working Group would expand to study the whole field of ICT, including the integrated broadcast-broadband system and next-generation DTTB system.

DiBEG will continue to promote the ISDB-T system worldwide and support the ISDB-T adopting countries.

Masashi Eto

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Fields of activity: ITU-T SG17

Towards a Secure IPv6 Environment

As a countermeasure against the exhaustion of the Internet Protocol version 4 (IPv4) address apace, Internet Protocol version 6 (IPv6) has been developed by the Internet Engineering Task Force (IETF). IPv6 is intended to provide many built-in benefits such as a large address space and self-configuration capabilities. Because it is a new protocol that is likely to be massively adopted in the coming years and operates differently than IPv4, both foreseeable and unforeseeable security threats will arise.

NICT has been focusing on research and development regarding IPv6 security from 2007 in order to identify and systematize security threats in the IPv6 environment and has developed countermeasures against those threats. NICT also launched the IPv6

Technical Verification Council in 2012 with IPv6 related industries and conducted experiments to verify the security capability of the IPv6 software stack of the members' products.

On the basis of these activities in NICT, I have been involved in the international standard of "IPv6 technical security guidelines" in ITU-T SG17 from 2012, which was approved in 2013 as Recommendation X.1037.

Recommendation ITU-T X.1037 provides a set of technical security guidelines for telecommunication organizations to deploy and operate IPv6 networks and services. The content of this Recommendation focuses on how to securely deploy network facilities for telecommunication organizations and how to ensure secu-

rity operations for the IPv6 environment. The Recommendation is also for developers of network products, security operators, and managers of enterprise networks that are planning to deploy IPv6 so that they can mitigate security threats on their IPv6 network.

I am currently in charge of the development of the draft Recommendation of "Secure software update capability for Intel-ligent Transportation System (ITS) communications devices" (X.itssec-1) in ITU-T SG17, as well as international standardization regarding IoT security. Through these activities, I will continue to contribute toward the realization of a trustworthy network environment.

Makoto Kadowaki

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Fields of activity: Optical Access Network

International Standardization Activities Related to Optical Access Systems

I have been involved in the standardization of optical access systems, aligning them with national standards for 100 Mbit single-fiber bidirectional optical transmission schemes through cooperation with the IEEE802.3 committee, and the drafting of ITU-T PON (Passive Optical Network) Recommendations, but here I would like to focus on my work as the main editor of ITU-T Recommendation G.986 (1 Gbit/s point-to-point Ethernet-based optical access system).

Since 2010, Japanese businesses have been calling for the establishment of a mutual interconnection environment that can satisfy future needs by offering 1 Gbit/s Internet connections. To this end, the drafting of standard specifications is being led by the Optical Access Sub-working Group of the Telecommunication Technology Committee (TTC; a national standards organization), and the process of submitting proposals to the ITU-T has also begun.

To create an ITU-T Recommendation, there were two issues that have to be addressed: (1) the segregation of the IEEE802.3 specification and the ITU-T SG15 Recommendation, and (2) the OAM (Operations, Administration, Maintenance) provisions used in this specification.

With regard to the first of these issues, ITU-T SG15 and the IEEE802.3 committee entered into a liaison relationship to coordinate their efforts. By clarifying the background to the specifications drawn up by both sides, we were able to get the IEEE802.3 committee to allow ITU-T to take charge of drawing up the carrier-class optical interface specifications.

The second issue was that of proposing OAM specifications that would be acceptable to other countries. We managed to achieve this by proposing a specification based on OMCI (ONU Management and Control Interface), which has already been accepted as the OAM of the current Recommendation (B-PON).

On the other hand, in the OAM transmission scheme used by the current Recommendation, we found that there were still some issues with the system's ability to accommodate multi-port type device models, but we were able to arrive at a solution by defining a new OAM transfer packet whereby a multiplexed structure can be introduced into the port information. I'm glad that these efforts resulted in Japan's proposals being accepted, allowing us to demonstrate the high level of Japanese technology to the rest of the world.

Susumu Tanaka

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Fields of activity: ASTAP

A Disaster Prevention ICT System Suitable for Developing Countries

Thank you everyone. It is a great honor to receive the ITU Association Award for Encouragement of International Activities.

Since 2012, in my capacity as chairman of the ASTAP (Asia-Pacific Telecommunity Standardization Program) specialist committee on disaster prevention and disaster recovery, I have been working on the standardization of ICT systems for disaster prevention. At the same time, NEC has also been playing an active role at disaster prevention workshops and other such events all over the world, where we have been introducing comprehensive and advanced disaster prevention ICT systems that have mainly been supplied to locations in Japan.

In conducting these activities, I have been acutely aware of the frequent occurrence of natural disasters such as tsunamis, typhoons and volcanic eruptions in Japan, and the large amounts of government funding allocated to disaster prevention.

Among the world's developed nations, Japan has made great progress in the installation of large-scale disaster prevention systems, both from a civil engineering viewpoint and from an ICT viewpoint. When we introduce these systems to people in devel-oping countries, people are amazed by and very grateful for their advanced capabilities.

However, getting developing countries to use these disaster prevention systems is a completely different matter. There are many things that developing countries should do as part of their nation-building efforts. Basic infrastructure such as electric power, roads, water supply and sewerage facilities are the most urgent needs, and the fact is that funding for the installation of disaster prevention systems is seldom available.

On the other hand, due to the effects of global warming, it is known that natural disasters are occurring more frequently in these developing countries. Since we must now face the prospect of dealing with disaster prevention on a more or less global scale, I hope we can create effective ICT systems that are more affordable to developing countries, allowing these systems to be actually introduced even with limited funding. Based on this idea, I hope to continue working on standardization efforts aimed at implementing disaster prevention ICT systems that are geared towards developing countries.

JICA Knowledge Co-Creation Program 2015
Improving ICT Policy Planning Skills Utilizing Standards
— Deployment of Better ICT Infrastructure to Overcome Challenges —

International Cooperation Department
The ITU Association of Japan

■ **Photo 1: Visit to MIC**

For about two weeks from January 21st to February 5th, 2016, the ITU Association of Japan carried out group training at the request of the Japan International Cooperation Agency (JICA). The content of the training was aimed at fostering people who can examine and create the ideal ICT policy to solve societal problems in their country by making use of the international standards and developing an ICT infrastructure. The international standards were considered as a reference point to carry out theoretical, practical training for an even more effective, more efficient telecommunications infrastructure.

This training has been carried out since 2012 by ITU Association of Japan with the cooperation of the MIC. This fiscal year is the 4th year, and seven trainees participated from five countries: Kiribati, the Solomon Islands, Myanmar, Mongolia, and India.

The training began with lectures on the Japanese government's telecommunications business policy and standardization policy related to telecommunications,

as well as lectures and reports on ITU standardization trends, task analysis techniques, inception report presentations, activities of Japanese standardization organizations, standardization activities of each of the related business organizations, and individual report presentations, in addition to observing related institutions.

Japanese telecommunications policy and standardization policy lectures were titled "Telecommunications Policy in Japan" (MIC) and "Standardization of ICT in Japan" (MIC). A lecture on "ITU-T: Standardization and ITU-T in ICT Fields" (TTC) was held to present ITU standardization trends, and lectures on "Towards Global Standardization in TTC" (TTC), "Standardization of Radio Systems" (ARIB), "Certification System for Telecommunications Equipment in Japan" (TELEC), "Overview of HATS" (HATS Conference), "NGN End to End Service Interoperability Test" (HATS Conference), and "Activities for Interoperability Tests and Standardizations

of Optical Access Systems" (HATS Conference) were held to present the activities done by Japanese standardization organizations.

Once lectures on Japan's telecommunications and standardization policies and on the state of ITU as well as activities such as those of Japanese standardization organizations were finished, a lecture was held on the analysis approach of Project Cycle Management (PCM). In addition to this, challenges related to standardization in the trainees' respective countries were sampled, and through group discussion, trainees shared their level of knowledge between them. Furthermore, this PCM lecture was held at the end of the training again, right before the individual report presentations, and group discussion gave each of them an opportunity to put in order the formulation of problem-solving methods for ICT standardization and the expansion of standardization activities in their respective countries.

Lectures titled "KDDI's Strategy for Development of ICT Service & Technology" (KDDI), "Current Status on Standardization of Future Network" (NTT), and "International Standardization of Mobile Communication Systems" (NTT DOCOMO)

■ **Photo 2: Visit to NTT DOCOMO**

■ **Photo 3: Visit to NICT**

■ Photo 4: Lecture at Japan Broadcasting Corporation

■ Photo 5: At Kanagawa Institute of Technology

were held to present the standardization activities done by each of the related business organizations.

The trainees visited facilities such as NTT DOCOMO's showroom, NICT's exhibition room, Fujitsu's showroom, the NHK (Japan Broadcasting Corporation), and NEC's showroom as well as the Kanagawa Institute of Technology's Interoperability Test Center (Smart House), and they observed the development of each company/organization's new technology and stan-

dardization activities and deepened their understanding of each company's latest technology and efforts toward standardization.

The trainees visited NTT DOCOMO's showroom "Future Station" and observed the near future of mobile communications. NICT (National Institute of Information and Communications Technology) held a lecture titled "Research and Development on ICT and Standardization Activities in NICT," and the trainees observed an outline of NICT's various activities. Fujitsu showroom's "Fujitsu Technology Hall" held a lecture titled "Fujitsu's Activity of International Standardization," and the trainees observed Fujitsu's latest technology. The NHK Broadcasting Center held lectures titled "Setup of Digital Terrestrial Television Broadcasting Network," "The Roles and Convergence of Broadcasting and Communications," and "The Outline of NHK Digital Content Service," and the trainees observed Hybridcast at the Technical Operation Center. At NEC's showroom "NEC Innovation World," a lecture was

held titled "Wireless Broadband Access," and the trainees observed NEC's latest technology. The Interoperability Test Center of the Kanagawa Institute of Technology held a lecture titled "Current Status of Smart-Houses," and the trainees observed a real smart house along with re-recognizing the importance of standardizing the various machines used for household-use.

Furthermore, starting this year, an English-speaking volunteer guide was arranged to create a chance for trainees to explore Japanese culture, and at the beginning of the training, they visited the Outer Gardens of the Imperial Palace, and at the very end, they visited Ginza.

On the last day of training, each trainee presented an individual report. The individual report was put together using the PCM approach learned during the training and was on such things as the current state of standardization activities and future developments, and they had a lively discussion on the outlook of each country's ICT standardization activities.

This training course was received favorably by the trainees, but to continue to provide training that is even more satisfactory, the ITU Association of Japan plans to collect evaluations, opinions, and requests regarding the lecture content, text, and facility tours, analyze the evaluation results, examine them, clarify points to be improved in the implementation of the course, and reflect these things in the next and future programs.

■ Photo 6: Lecture at Kanagawa Institute of Technology

■ Photo 7: Visit to Fujitsu

ITU KALEIDOSCOPE 2016

ICTs for a Sustainable World

The 8ᵗʰ ITU Kaleidoscope academic conference

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