ISSN 0915-3160

平成三十一年四月十日発行（年四回一、四、七、十月の十日発行）通巻百二十二号 New Breeze

New Breeze

Quarterly of The ITU Association of Japan

No. 2
Vol. 31 April 2019
Spring

Special Feature

SDGs

KDDI Foundation Activities for Achieving SDGs
Sustainable Development Goals (SDGs)
Contributing to SDGs through Social Innovation Business
Fujitsu's Approach to SDGs
The Mitsubishi Electric Group and the SDGs

New Breeze ISSN 0915-3160
Quarterly of The ITU Association of Japan
BN Gyoen Bldg., 1-17-11 Shinjuku, Shinjuku-ku,
Tokyo 160-0022 Japan
Tel: +81-3-5357-7610 Fax: +81-3-3356-8170
https://www.ituaj.jp/?page_id=310

Publisher: Toru Fukuoka

Editors: Junichi Kishimoto
Kaori Ohno
Naoko Ishida

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.

e-mail address: kikanshi@ituaj.jp

Subscription forms are available on the ITU-AJ website:
http://www.ituaj.jp/english/subscription_form.pdf

Subscription Fee:

Single issue:	¥1,500
Annual subscription (4 issues):	¥6,000

Disclaimer: Opinions expressed in this publication are those of The authors and do not necessarily represent those of The ITU Association of Japan.

CONTENTS

About 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.

KDDI Foundation Activities for Achieving SDGs

—ICT Infrastructure Buildup and Human Resources Development in Myanmar—

Masatoshi Suzuki
President
KDDI Foundation

1. Introduction

In 2015, the United Nations summit adopted the 2030 agenda for sustainable development to transform our world, containing 17 Sustainable Development Goals (SDGs) and 169 targets by 2030. These SDGs promote prosperity for all countries while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection (Ref: United Nations website). SDGs reflect the grand global objective of "No one must be left behind."

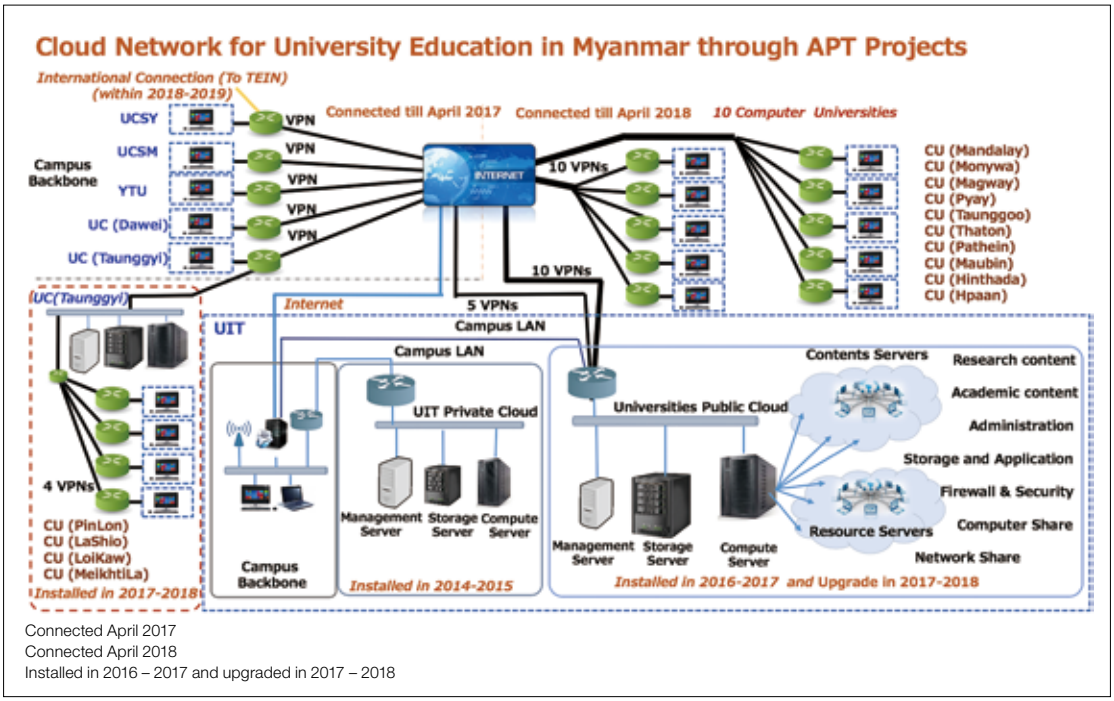
SDGs can only be achieved by integrating the knowledge and expertise of diverse fields spanning economics, society, the environment, and science and technology. Information and communications technology (ICT) will play a significant role in this endeavor. It is also important to raise the level of infrastructure buildup, education, and science and technology especially in developing countries to eliminate inequality among countries.

As a Public Interest Incorporated Foundation fulfilling the corporate responsibility of KDDI Group by social contributions, KDDI Foundation has been engaged in international cooperation supporting many developing countries such as Cambodia, Myanmar, and Nepal for the purpose of contributing to the sustainable development of international society. As an example of these activities, this article introduces ICT infrastructure buildup and human resources development in higher education in Myanmar.

2. ICT infrastructure buildup for education in Myanmar

Improvement of the ICT infrastructure for educational purposes plays a very important role in Myanmar's national reformation. In Myanmar, where the ICT infrastructure for education is still weak, the first action taken up by parties related to higher education in Myanmar and concerned parties from Japan including KDDI Foundation was to construct a cloud network for universities via Asia-Pacific Telecommunity (APT) projects. The first project to construct a private cloud system for use within a university began in fiscal year 2014. This involved the construction of an on-campus cloud system at the University

Figure : Myanmar network for higher education constructed through APT projects



Connected April 2017
Connected April 2018
Installed in 2016 – 2017 and upgraded in 2017 – 2018

Photo 1: Server construction work with two university instructors (center of photo)

of Information Technology (UIT)—a core university for computer studies in Myanmar—for education and research, and technology transfer of methods and techniques for using, operating and maintaining, and configuring this system. Following this, in the 2nd APT project started in FY2016, we connected the cloud system to six universities based on a Virtual Private Network (VPN) and implemented advanced ICT educational programs in the cloud system. After that, in the 3rd APT project started in FY2016, the number of universities connected to this system was extended to 16 and cyber security functions were strengthened. Furthermore, based on financing provided by KDDI Foundation, four more universities were connected and three more sub-cloud systems were added at University of Computer Studies, Taunggyi, Yangon Technological University and University of Computer Studies, Mandalay. This completed a highly reliable distributed cloud system for 20 universities. We expect this shared cloud system for universities to contribute to advance education and research activities in Myanmar and to help a progressive expansion of Myanmar's educational network infrastructure.

3. ICT Human resources development

KDDI Foundation has been hosting an Application Contest for University Students since FY2017 under the theme of solving social problems through application development. The first contest was attended by 18 universities including universities related to the APT projects. Out of 55 teams, 10 teams passed a preliminary selection process, and the final contest with presentations and demonstrations was held on March 3, 2018 in Yangon, Myanmar. This contest was supported by the Embassy of Japan in Myanmar and cosponsored by several Japanese companies. In addition, Professor Hiroshi Esaki of the Graduate School of The University of Tokyo served as co-chair of the judging committee for this contest. The winner was TEAM EASY-Q of UIT, which won for the sophistication of their application and their skillful demonstration. The second Application Contest was held again, in Yangon, Myanmar, on February 23, 2019. The number of participating universities increased to 46, and both programing and presentation skills showed much improvement since the last contest. These contests aimed not only to sharpen technical skills in programming but also to develop problem identification and analysis skills, comprehensive-planning skills, and presentation skills in English. We have confidence that continuation of these kinds of activities can contribute to the sustainable development of Myanmar. They are an effective means of developing ICT human resources and we plan to expand the scale of such activities in the future. We also promote a variety of application validation experiments based on collaboration between Japanese and Myanmar's universities. On October 18, 2018, demonstration of remote medical care learning between Kyusyu University and three medical universities in Myanmar was conducted.

In addition, KDDI Foundation and the Asia Pacific Network Information Centre (APNIC) have jointly started to sponsor training in advanced Internet technologies for university instructors and network managers throughout Myanmar. Two training courses were provided at University of Computer Studies, Yangon in September and December in 2018. Training instructors and teachers, as well as students, will be essential for future self-reliance from the view point of sustainability.

4. Conclusion

It is important that many people across diverse countries and fields fulfill their respective roles on the path toward achieving the SDGs. They must share the overall goal of solving a wide range of social problems so that everyone as global citizens can participate equally in a prosperous future. In this article, we introduced activities in Myanmar on human resources development and improvement of the educational environment through ICT technologies for the purpose of eliminating inequality among countries. Similar activities focusing on the spreading of ICT and enhancement of educational environment in developing countries have been conducted, such as the building of schools and installation of computers, holding of English and music classes in Cambodia, installing optical fiber systems in Mongol, Nepal and Cambodia, and introducing an e-leaning system for universities in Nepal.

KDDI Foundation hopes to contribute to achieving these SDGs through ongoing and committed activities in developing countries while strengthening its global partnerships and spreading Japanese technologies as an advanced ICT nation.

Photo 2: Group photo at Application Contest

Sustainable Development Goals (SDGs)

—*Synecoculture*—

Kousaku Ohta
Sony Computer Science Laboratories, Inc.

Masatoshi Funabashi
Sony Computer Science Laboratories, Inc.

1. Introduction

The UN Sustainable Development Goals aim to address a wide range of issues. Wall et al.[1], in particular, stressed the need to pursue a concerted effort in addressing soil-related issues, specifically in regard to Goals 1, 2, 3, 6, 8, 11, 13, 14, and 15. Agriculture is an area that is deeply related to all these goals.

2. Agriculture

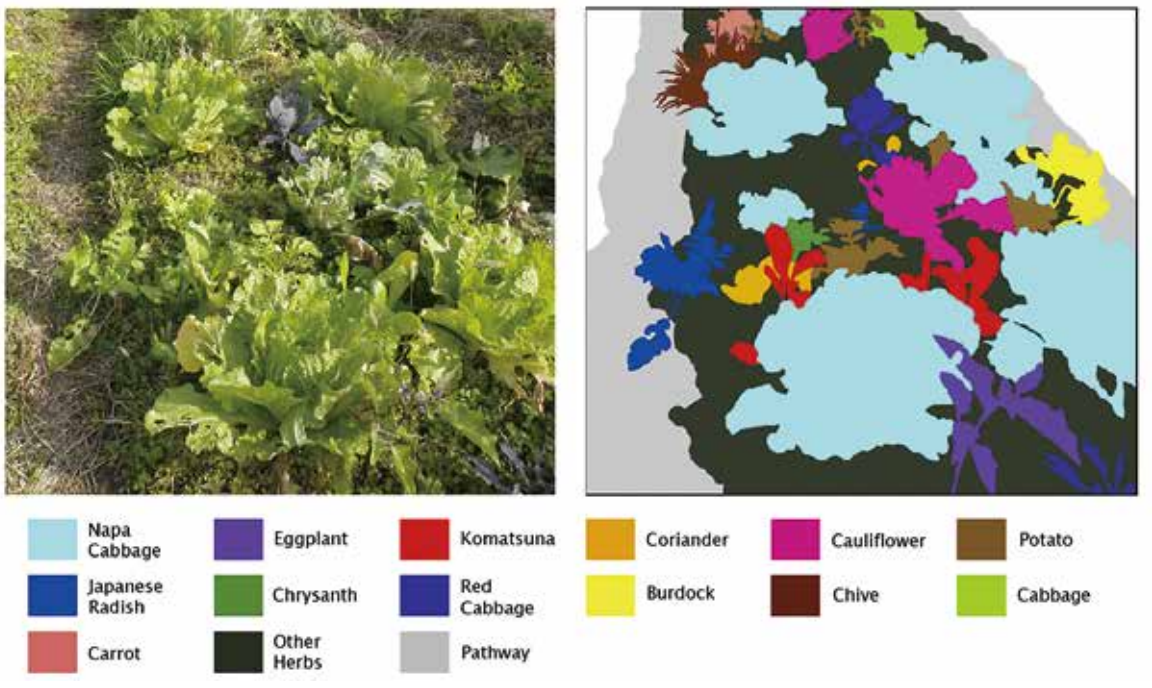
Conventional agriculture is premised on the use of tillage, fertilizers, and chemicals regardless of its scale, which has led to the destruction of the environment and reduction of biodiversity. Some reports assert that continuing the current agricultural practices based on these three elements (tillage, fertilizers, and chemicals) is no longer feasible[2], and others point to the danger of causing rapid and irreversible destruction of the ecosystem on a planetary-scale if the reduction of biodiversity continues unabated[3]. Many biologists are warning that the sixth mass-extinction event in the history of our planet is already underway as a result of agriculture and other human activities. The radical transformation of agriculture systems has become an overriding priority in pursuing the sustainability of human society.

3. Synecoculture

In response to this situation, Sony Computer Science Laboratories (Sony CSL) has launched the Synecoculture Project.

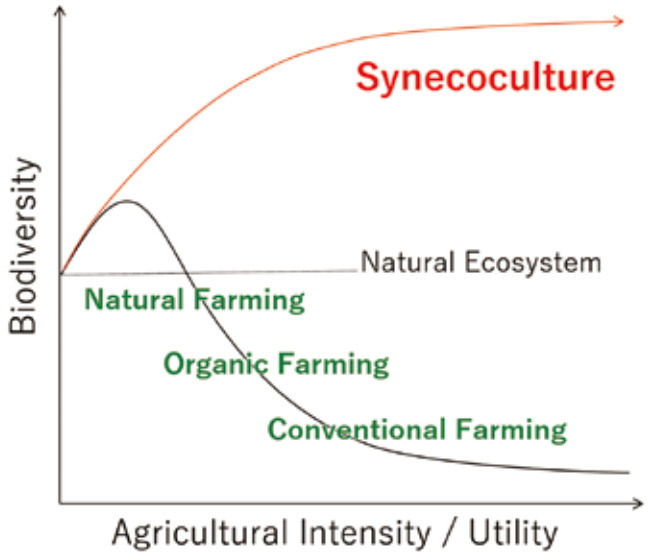
The synecoculture concept was developed by Takashi Otsuka of Sakura Shizenjuku Global Nature Network and was scientifically formalized as a farming method by Masatoshi Funabashi of Sony CSL[4]. As a farming method, synecoculture is also aimed at contributing to sustainable food production, protection of biodiversity, improvement of human health, alleviation of poverty and depopulation, etc.[5] It is characterized by a departure from the above three elements of conventional agriculture (tillage, fertilizers, and chemicals), wherein a wide variety of plant species are densely cultivated together (Figure 1) to achieve a level of biodiversity higher than that of the natural state, in order to produce a variety of food products in a sustainable manner. It aims to fundamentally surmount the current trade-off between biodiversity and productivity and achieve a high level of balance between utility and diversity of the farm ecosystem

Figure 1: Left photo shows part of a plot in a synecoculture farm, and right figure shows the plant species within that plot.



by enabling humans to control the farm ecosystem based on ecological information (Figure 2).

Figure 2: Relationship between agricultural intensity and biodiversity for different farming methods



4. Experiments in Burkina Faso

Production experiments have been conducted since 2015 by local residents in Burkina Faso, a low-income country south of the Sahara Desert. From a state of devastation due to the substantial destruction of the soil caused by traditionally continued conventional farming, the introduction of synecoculture has resulted in the restoration of the ecosystem and achieving remarkable productivity in one year (Figure 3).

From a 500-m^2 plot of land, local residents were able to achieve an income level that was 20 times higher than the per capita gross national income of Burkina Faso. This means being able to provide the minimum necessary wage to live in the capital city of Ouagadougou from a 10-m^2 piece of farmland, pointing to a practical solution to the poverty problem through agricultural production. Other than exhibiting productivity that was 40 to 150 times higher than that of conventional farming, synecoculture was able to reverse the deteriorated condition of the soil. Calculations have also shown that if 1% of the population of Burkina Faso implements synecoculture in 7000 ha of farmland, the country would be able to totally eradicate poverty.

These achievements, with support from the Burkina Faso government and the Embassy of Japan in Burkina Faso, have led to the establishment of the African Center for Research and Training in Synecoculture (CARFS) and the launch of the African Forum on Synecoculture (the 4th forum was recently held in Tunisia). Joint research activities with the University of Ouagadougou are also now underway.

5. Contribution of synecoculture to health

Synecoculture not only enables balancing productivity and establishment of the environment in small-scale farming, but it has also been found to have substantial implications for human health.

Dietary habits, environment, and health form a tightly linked three-pronged connection (trilemma). The widespread consumption of food that contains a large amount of refined sugar, fats, and oils has further intensified the need for conventional farming practices that have high environmental impact and has aggravated the risks of chronic non-communicable diseases in humans. Traditional diets that are environmentally friendly (consumption of useful plants and animals in their natural state) have the potential to help resolve this trilemma[5].

Synecocultural products are scientifically divided into *in natura* products, which are defined as equivalent to products in their natural state, and *in cultura* products, which are the products of conventional agriculture[6]. Cultured fish and farmed livestock are artificially and excessively fed beyond their natural state, and are fattened to increase their commodity value (the livestock feeds used are also produced as *in cultura* products, wherein food

Figure 3: Changes observed in the experimental farm in Burkina Faso
From a condition of not having even weeds grow when the land was left untended, to one in which useful plants have grown so thick as to hide the soil within one year.

production is cycled in the *in cultura* state). In the same way, crops cultivated using conventional farming receive excessive amounts of fertilizer and are grown in soils that are constantly tilled in a manner inconceivable in the natural state. In other words, the metabolic state of conventionally grown vegetables is similar to that of fattened livestock, and therefore may be likened to a plant version of the metabolic syndrome. In their natural state, plants interact with their surrounding ecosystem as they are faced with various nutritional deficiencies, enabling them to produce different kinds of bioactive compounds that subsequently contribute to the health of the animals that feed on them. Monocultured crops that grow by absorbing fertilizers from tilled soil have most likely lost some of the health benefits that are vital for our metabolism.

We have in fact received many reports of health improvement from consumers of vegetables and tea produced through synecoculture. Although these are based on the consumers' subjective experience, which may include some bias, we have observed a certain level of commonality in the way by which their symptoms have improved, indicating that these observations are empirically reproducible.

We therefore conducted some objective analyses based on these observations. In a metabolome analysis, we have demonstrated that synecoculturally produced coarse tea contains compounds that affect our in vivo metabolic pathways to a higher extent than conventionally produced coarse tea. Further, after providing both synecoculturally produced coarse tea and conventionally produced coarse tea to a rehabilitation facility for elderly persons, we found that synecoculturally produced coarse tea is more effective in improving activities of daily living in the subjects (comparison through a double-blind experiment).

Synecoculture contributes not only to environmental preservation and sustainable food production, but also to health promotion, and we are therefore conducting further research on the relationship of these three elements.

6. Current status and future plans

We have seen the potential of the widespread implementation of synecoculture in contributing to the solution of various issues being addressed through the SDGs. Synecoculture is now being practiced in other countries aside from Burkina Faso.

In the international arena, the UniTwin UNESCO Complex Systems Digital Campus program has launched a project to achieve World-wide Wellbeing in the context of the SDGs with synecoculture as its leading initiative[7]. With the establishment of the Decentralized Autonomous Organization, a decentralized society based on next-generation Internet technologies, science is seen to play a more significant role in society, as its relationship with the management of the real world and of industries become increasingly interactive and real-time. In addition to the three independent powers that constitute the power of the state, namely, legislative, executive, and judiciary; science, which carries out measurement and evaluation of laws in various practical ways, will be necessary as a "fourth independent power" that will serve as the guardian of sustainability, in order for the current social systems to implement effective decisions pertaining to sustainability.

There are also challenges, however, that synecoculture must overcome. One is the vast amount of information needed for putting together and making use of the complex relationships within the ecosystem. Extensive information-processing is needed to digitalize multifarious variables and conditions—including data on the diverse species of plants and insects, regional climate, soil properties, indigenous vegetation, previous crop growth conditions, invasive weed species, vegetation plan for the following years—and to achieve optimization based on relationalism. Synecoculture may also be considered, therefore, as an attempt to transform agriculture into an information industry.

We have developed a "Megadiversity management system" as a software that supports humans in properly managing these complex phenomena surrounding synecoculture. We are currently pursuing research and development so that the system will be able to contribute, not only to synecoculture, but also to all human activities, by enhancing human intelligence through the effective use of machine learning, various sensors, and individual empirical knowledge.

We believe that by integrating Sony's technologies as well as those of other companies to enable the realization of an abundant society where everything coexists together, the system and its value chains will eventually evolve to serve as the next generation standard.

References
[1] Wall D *et al.* "Soil biodiversity and human health" Nature 528, 69-76, (2015)
[2] IAASTD. "Agriculture at a Crossroads: Synthesis Report" (2008) https://www.globalagriculture.org/fileadmin/files/weltagrarbericht/IAASTDBerichte/SynthesisReport.pdf (Accessed on 2018.07.07)
[3] Barnosky AD *et al.* "Approaching a state shift in Earth's biosphere" Nature 486, 52-58, (2012)
[4] Funabashi M. "Synecological farming: Theoretical foundation on biodiversity responses of plant communities" Plant Biotechnol. 33, 213-234, (2016)
[5] Tilman D & Clark M. "Global diets link environmental sustainability and human health" Nature 515, 518-522, (2014)
[6] Funabashi M. "Human augmentation of ecosystems: objectives for food production and science by 2045" npj Science of Food 2, Article number: 16 (2018)
[7] http://www.cs-dc.org/

Cover Art

Picture of kabuki actor Iwai Kumesaburo as Osen in Crescent Moon (Mikazuki).

Utagawa Toyokuni (1769-1825)

Collection of the Art Research Center (ARC)
Ritsumeikan University
Object number: arcUP0037

Contributing to SDGs through Social Innovation Business

Naoko Okada
Manager
Planning Department, Sustainability Promotion Division
Hitachi, Ltd.

This article introduces Hitachi's contributions to achieving Sustainable Development Goals (SDGs) through sustainability and social innovation business.

1. Hitachi and sustainability

The roots of Hitachi, Ltd. lie in machine repair work for mines in the city of Hitachi, Ibaraki prefecture. The facilities at that time were foreign made, and during his daily work of maintaining this machinery, Hitachi founder Namihei Odaira developed a strong conviction that "We can't just repair foreign products—we must also develop and establish our own technologies." With this in mind, he and his colleagues began by developing a five-horsepower induction motor.

For over 100 years since the company's founding, Hitachi's corporate mission of "Contribute to society through the development of superior and original technology and products" and its founding spirit of "Harmony, Sincerity, and Pioneering Spirit" have been carefully handed down to successive generations.

Figure 1: Hitachi founder Namihei Odaira

Figure 2: Hitachi hut at founding (1910, Ibaraki prefecture)

Hitachi is proactively engaged in social innovation business based on this corporate mission and founding spirit. Today, Hitachi aims to find solutions to the issues confronting society, improve the quality of life, and contribute to achieving a sustainable society by combining its operational technology (OT), information technology (IT), and products developed over many years and by advancing its social innovation business through co-creation with partners and stakeholders.

2. Hitachi and SDGs

Hitachi's wide range of business fields enables it to make diverse contributions to achieving SDGs. Against this background, the Executive Sustainability Committee chaired by President & CEO Toshiaki Higashihara was established in April 2017 to study the 17 SDGSs and the risks and opportunities that Hitachi business related to each goal represent to society and the environment. As a result of this study, Hitachi identified five goals to which it could make major contributions through its business strategy and six goals to which it could contribute through overall corporate activities. However, as all 17 SDGs are interrelated to some extent, Hitachi seeks to contribute directly and indirectly to achieving all 17 goals. The purpose of Hitachi's sustainability strategy is to clarify the social value and impact of its social innovation business based on global trends in business risk and opportunities and to achieve sustainable growth as a company over the medium and long term.

■ Figure 3: SDGs targeted for contributions by Hitachi

3. SDGs targeted for contributions through business strategy —energy for a sustainable society—

The five SDGs to which Hitachi seeks to make contributions through business strategy are closely related to the four main business fields of its social innovation business, namely, "power and energy," "industry, distribution, and water," "urban development," and "finance, society, and healthcare." Hitachi's approach to achieving these goals is to create social value through business that is simultaneously a business opportunity for the company. The following introduces examples of contributing to the energy field in terms of current conditions in the world and Hitachi's stance and efforts.

(1) Current conditions in the world

Electric power is indispensable to modern society—it helps supports daily living and social infrastructures familiar to everyone such as global information-communications systems, healthcare services, and transportation systems. Nevertheless, there are still a great number of people in the world that spend their life without daily access to electricity. In addition, much of the power supplied around the world is still based on carbon resources generating a high amount of CO_2 emissions while being highly dependent on human labor as in the mining industry.

(2) Hitachi's stance

Hitachi considers that a stable and efficient supply of renewable energy is an important factor in creating a prosperous and sustainable future. It believes that proposing solutions through co-creation with all partners and stakeholders along the energy value chain is effective in supplying power and countering global warming.

(3) Hitachi's efforts

Hitachi aims to produce clean energy from all sorts of resources including renewable energy such as wind power and solar power and to supply power in a stable and sustainable manner by combining its product development expertise from energy production to consumption and its strengths in OT and IT. As part of its efforts toward achieving a set of long-term environmental targets announced in September 2016 as "Hitachi Environmental Innovation 2050," Hitachi is contributing to reducing CO_2 emissions through the development and popularization of product and services with high environmental value.

4. SDGs targeted for contributions through overall corporate activities

Hitachi has specified six SDGs for making contributions through overall corporate activities. Stakeholders themselves have expectations that Hitachi will work to achieve these goals, and Hitachi recognizes its social responsibility in doing so. Hitachi also sees these goals as important elements in achieving sustainable business for itself. At the same time, Hitachi feels that respect for human rights forms the basis of all 17 SDGs and places importance on reducing the negative impact of its business activities on human rights all along the value chain.

Respect for human rights is a priority issue for companies doing business on a global scale, but carrying out activities in this regard is a difficult problem. It is hoped that companies will address problems related to human rights by conforming to international standards including the United Nations "Guiding Principles on Business and Human Rights." Here, it is not simply a matter of avoiding an infringement of human rights—companies must also take a proactive stance beyond that basic principle since respect for human rights is connected to achieving all 17 SDGs.

Hitachi, which is expanding its value chain on a global scale and deals directly with a variety of working environments, business practices, and trading customs, established the "Hitachi Group Human Rights Policy" in 2013. This policy clarified methods of respecting human rights not only for the Hitachi Group but also for all stakeholders related to Hitachi business. Furthermore, as an example of efforts to educate others on the issue of human rights, Hitachi President & CEO Toshiaki Higashihara has been delivering a human-rights message to directors and employees of Hitachi, Ltd. and Hitachi Group companies inside and outside Japan on Human Rights Day, which is observed annually on December 10. In addition, the procurement department in 2015 and human resources department in 2016 conducted due diligence on human rights and readjusted existing mechanisms. They also evaluated human rights risks with respect to supply-chain and group employees, assigned priorities, and studied measures for improvement. Based on the results of these activities, Hitachi continues to formulate concrete and effective measures for reducing human rights risk.

As described above, Hitachi's founding spirit is based on harmony, sincerity, and pioneering spirit. Here, one meaning of "sincerity" is undertaking work with a sense of trustworthiness and responsibility, but another meaning can also be considered. Hitachi Henjinkai, an association of Hitachi employees and alumni holding advanced academic degrees, professes that the word "sincerity" (*makoto* in Japanese) can also be used to convey feelings of warmth and compassion and work done in a selfless and faithful manner. Hitachi has had such a spirit from the very beginning—it believes that the fundamental meaning of the word "sincerity" from a corporate perspective is to have a warm-hearted feeling toward employees, customers, and everyone in society surrounding the company along with a strong desire to make important contributions to society.

Going forward, Hitachi is committed to making contributions to society through its social innovation business. Hitachi will endeavor to clarify the risks that its business may bring to society and the environment and will deal with those risks head-on through carefully thought-out measures. From a long-term perspective, Hitachi will continue to study all 17 SDGs and will incorporate its sustainability strategy in its next Mid-term Management Plan.

Fujitsu's Approach to SDGs

Hiroki Fujii
Shared Value Promotion Department
CSR & Sustainable Development Strategy Division
Responsible Business Unit
Fujitsu Limited

1. Introduction

Today, the world faces diverse threats. Although the world's economies have developed rapidly since the Industrial Revolution, there have also been major social issues such as explosive population growth, concentration of populations in cities, uneven wealth distribution, problems with the food & water supply, terrorism & armed conflict, and disasters caused by climate change.

Under such circumstances, businesses view the world with a mixture of both anticipation and trepidation. Are they agents of evil, causing social issues through their pursuit of economic benefits, or are they white knights that aim to solve these issues through innovation?

2. SDGs and the role of enterprises

In 2015, the United Nations drew up a plan for the resolution of social issues all over the world. This includes a list of seventeen sustainable development goals (SDGs) to be achieved by 2030, following on from the Millennium Development Goals (MDGs) set forth in 2000. However, while the MDGs were action targets that mainly called for national governments to support developing countries, the SDGs seek to provide a better life for people in every part of the world, including developed countries. It is expected that delivering these goals will require efforts to be made by NPOs, NGOs and individuals as well as governments.

The SDGs are not simply social contributions. Businesses are expected to contribute to achieving SDGs through their actual business activities, and indeed many global businesses are starting to act as centers for new business opportunities.

According to the Global e-Sustainability Initiative & Accenture Strategy report,* the realization of SDGs is expected to grow the market in the ICT sector alone to $2.1 trillion. Institutional investors have also focused on the social responsibility of corporations, including their response to the SDGs. The UN's Principles for Responsible Investment (PRI) have already been signed by 1,700 organizations with over $US 70 trillion of assets under management, and it is now becoming incumbent on businesses to accept their social responsibilities.

3. Fujitsu's approach

We believe that these SDGs will ultimately be achieved not through the efforts of a single business, but through collaboration with many other businesses, NPOs, NGOs, international organizations and other bodies. At the January 2018 annual meeting of the World Economic Forum in Davos, Fujitsu President Tatsuya Tanaka had talks with many industry leaders on the subject of SDGs. In the same month, Masami Yamamoto was appointed as vice chairman of the World Business Council for Sustainable Development (WBCSD), which is a prominent organization promoting SDGs. Since then, he has played a central role in solving problems on a global scale. Through these efforts, we are forging new connections, building the momentum of SDGs, and seizing the opportunity to increase the scale of Fujitsu's business.

Some examples of Fujitsu's collaborative approach to SDGs are introduced below.

[Case 1] Contributing to the social preparedness by supporting the construction of a Global Database for Disaster Statistics

The Sendai Framework for Disaster Risk Reduction was adopted by the UN in March 2015. Within this framework, it was agreed that every country would make efforts towards achieving seven targets by 2030, including reducing the impact of natural disasters in terms of fatalities, the number of people affected, the direct economic effects, and damage to key infrastructure.

With the aim of monitoring progress towards these targets and compiling disaster statistics, the United Nations Development Programme (UNDP) and the International Research Institute for Disaster Science (IRIDeS) at Tohoku University established the Global Centre for Disaster Statistics in April 2015. While the UNDP operates in developing countries to help with collecting disaster statistics, releasing information, and planning government policies, Tohoku University is storing and analyzing the statistical data from each country and providing these countries with advice through the UNDP. At Fujitsu, we are providing free assistance in the design and construction of a global database (GDB) as a platform for the storage of disaster statistics, and we are also helping people make effective use of this database. We are currently involved in the preparation of a disaster design database for seven pilot countries in Asia, and from 2020 we plan to expand this initiative to 20 countries around the Asia–Pacific region.

Through these activities, Fujitsu is helping to improve the

* Reference: Global e-Sustainability Initiative & Accenture Strategy, "#SystemTransformation: How Digital Solutions Will Deliver Progress Towards the Sustainable Development Goals," 2016

disaster risk reduction capabilities of developing countries, and is contributing to the creation of societies that are able to withstand major natural disasters. (Figure 1)

[Case 2] Transferring environmental technology by participating in WIPO GREEN

At Fujitsu, we aim to contribute to conservation of the global environment by promoting our green technology widely throughout society, and we are participating as a partner in the WIPO GREEN framework operated by the World Intellectual Property Organization WIPO (a specialist UN organization that transfers and matches green technology and services to where they are needed). Over 400 of our intellectual properties related to green technology have already been registered in WIPO GREEN, and we are now working on licensing these technologies.

By working on this international framework, Fujitsu is promoting open innovation on a global scale through the dissemination and transfer of green technology. In this way, we are contributing to the efforts such as the realization of a low-carbon society and adaptation to climate change. (Figure 2)

4. Conclusion

At Fujitsu, our corporate philosophy is to use technology to make the world more prosperous, and with this in mind, we have developed business aimed at using IT to solve the problems of societies around the world. Our philosophy aligns perfectly with the SDGs. Moving forwards, we hope to serve as a white knight in solving societal problems through the use of innovative IT, and to contribute to sustainable global development in partnership with various other businesses and organizations.

Figure 1: Supporting the construction of a disaster statistics Global Database (GDB)

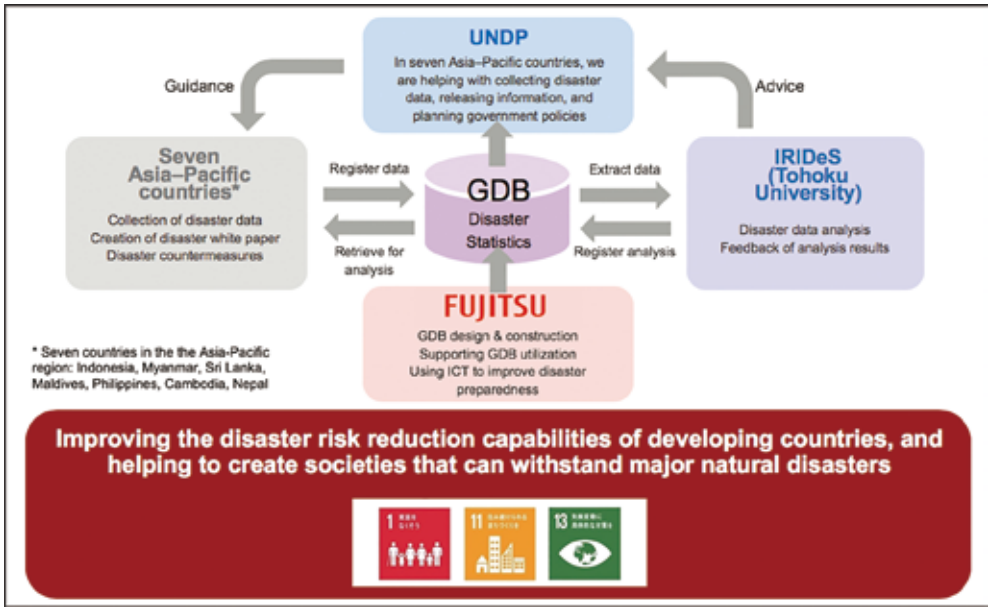
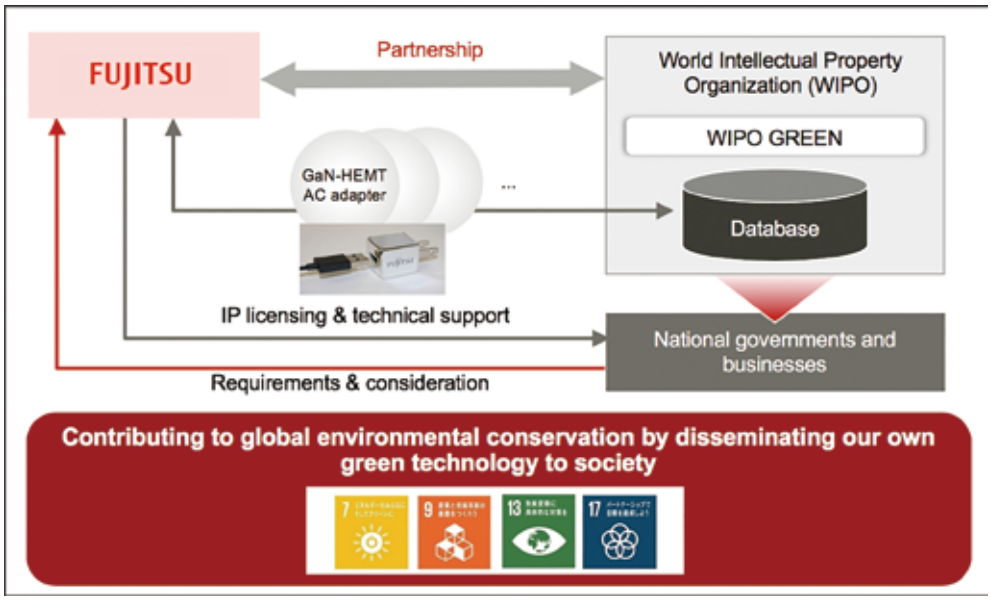


Figure 2: Participation in the WIPO GREEN framework



The Mitsubishi Electric Group and the SDGs

—Solution of social problems by means of autonomous driving technologies—

The Mitsubishi Electric Group

1. Initiatives to Address the SDGs

As set forth in the corporate strategy, the Mitsubishi Electric Group positions itself to become a "Global, Leading Green Company". As such, we contribute to the realization of a prosperous society that simultaneously achieves "sustainability" and "safety, security and comfort" as an embodiment of the Group's corporate mission. This policy corresponds to what the globally shared goals of the SDGs aim to achieve.

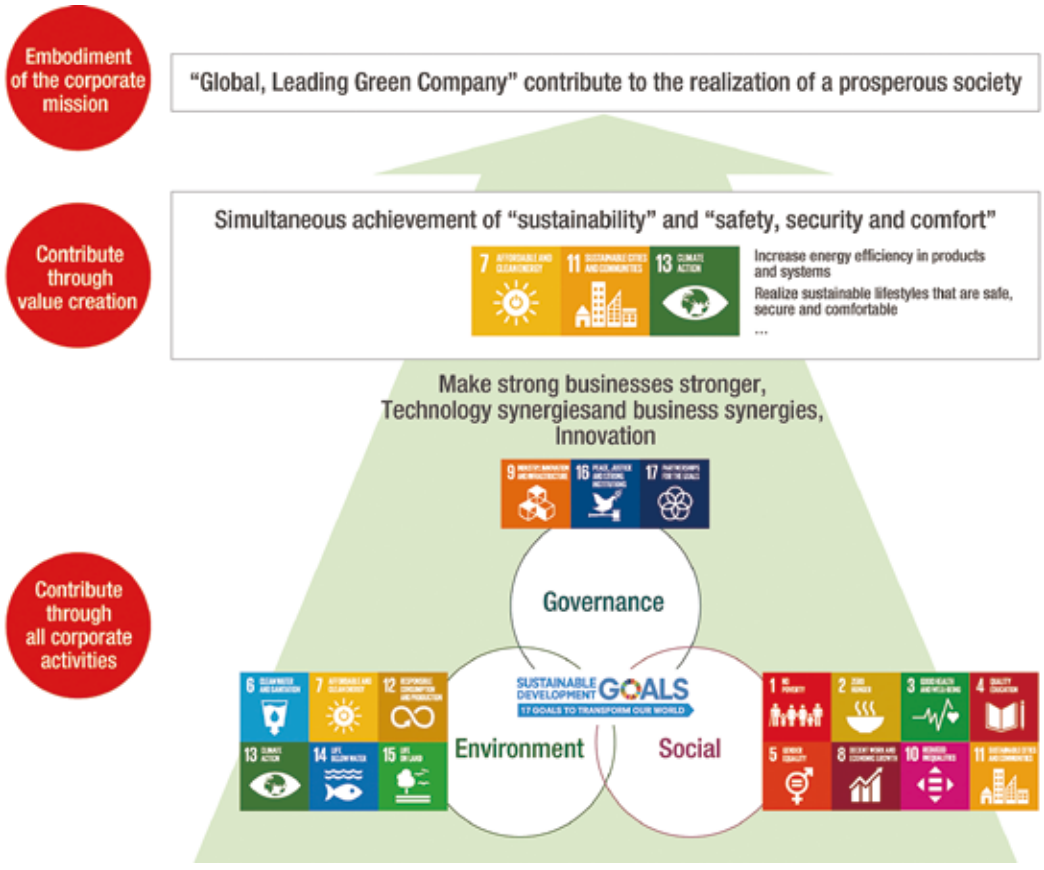
Through the Group's diverse businesses and corporate activities related to the environment, society and governance (ESG), we believe we can make a contribution toward accomplishing the 17 globally shared goals of the SDGs.

However, to contribute further, we need to identify goals to which we are particularly well positioned to contribute. As a comprehensive electronics manufacturer, we can contribute significantly to Goal 7 "Affordable and clean energy", Goal 11 "Sustainable cities and communities," and Goal 13 "Climate action" are areas that correspond to our vision of becoming a global, leading green company. We will contribute even more to achieving the SDGs by creating value in these areas via technology synergies and business synergies and prioritizing the initiatives we advance.

In these ways, the Mitsubishi Electric Group will integrate the concept of the SDGs into its management strategy and continue to promote company-wide awareness of the SGDs.

As part of this, we now introduce our autonomous-driving technologies, which realize "Safety, security and comfort" and contributes to Goal 11 of the SDGs, "Sustainable cities and communities."

Figure 1: SDGs for the Mitsubishi Electric Group to prioritize



2. Towards the solution of traffic issues via autonomous driving technologies —bringing together core Mitsubishi Electric technologies—

Traffic accidents and traffic congestion are responsible for enormous economic and social losses. In Japan, where a declining birthrate and an aging population are seeing accidents caused by elderly drivers becoming a social problem, these are urgent issues. The Mitsubishi Electric Group is working to realize high-precision autonomous driving systems through the fusion of two technologies: self-sensing driving technologies and network-based driving technologies.

We anticipate that this will realize solutions to societal issues, such as reducing traffic accidents, easing traffic congestion, and improving access to transport in remote areas.

3. Autonomous driving mechanisms and the Mitsubishi Electric Group technologies that support them

3.1 Self-sensing driving technologies

Self-sensing driving technologies will enable vehicles to operate autonomously using a variety of onboard sensors, including cameras, millimeter-wave radar and sonar. Applying sensing technologies fostered in a broad range of fields, the Mitsubishi Electric Group is working to develop new products that assist drivers in recognition, judgment, and vehicle operation.

Mitsubishi Electric will continue to polish these technologies into the future, at the same time as advancing applied development in the area of integrated control systems that will be key to the realization of safer, more secure and more comfortable autonomous driving, with the company's core AI technology Maisart as a central element.

3.2 Network-based driving technologies

Network-based driving technologies are new technologies that seek to enable more precise autonomous vehicle operation by means of cooperation between the vehicle and infrastructure in the surrounding environment. In order to realize these systems, a diverse range of technologies must be integrated, allowing us to make use, apart from the vehicle itself, of systems three-dimensional maps, and intelligent transport systems.

3.3 The Quasi-Zenith Satellite System: Satellites that provide high-precision position data

Three satellites of the Quasi-Zenith Satellite System were launched in 2017. Mitsubishi Electric was responsible for the design and manufacture of this satellite system, which provides high-precision position data services. The use of these services will make it possible to realize autonomous driving in a range of road environments and conditions in which visibility is poor, such as heavy fog or snow. Mitsubishi Electric commenced proving trials of autonomous driving on Japanese expressways from September 2017, and we have demonstrated that the use of high-precision positioning terminals that receive position data signals from the Quasi-Zenith Satellite System makes it possible to identify the position of the subject vehicle at the level of centimeters.

3.4 High-precision 3D maps

Dynamic maps are essential to accurately identifying the position of the subject vehicle on a map. In addition to static data on lanes and road edges, these digital maps include dynamic data that changes moment to moment, such as data on congestion and traffic signals. The Mitsubishi Electric Group is continuing research and testing in this area, and has been commissioned by

Figure 2: Self-sensing driving technologies and Network-based driving technologies

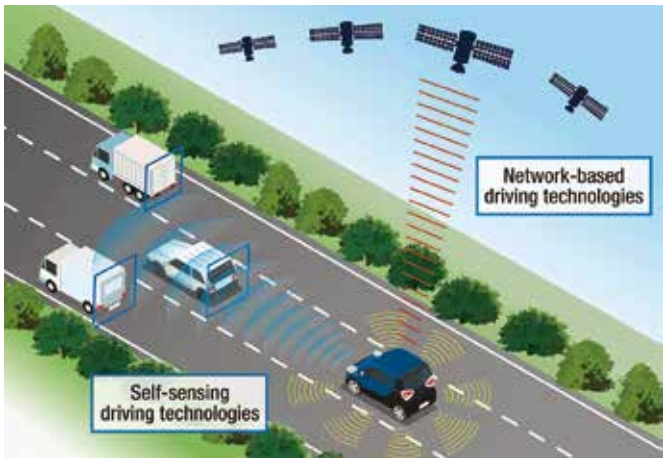
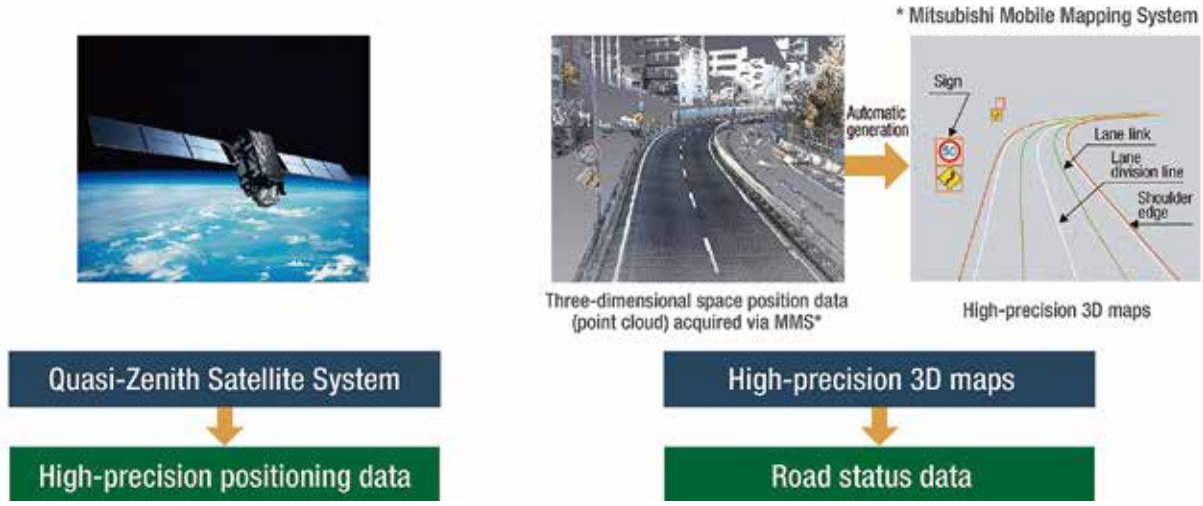


Figure 3: Onboard sensors and vehicle control technologies

Figure 4: High-precision positioning data & Road status data



a government agency to conduct and manage large-scale proving trials towards the creation of digital maps. In addition, in June 2017, Mitsubishi Electric joined together with an industrial innovation network, mapping companies, surveying companies, and Japanese automotive manufacturers to launch Dynamic Map Platform Co., Ltd., which is moving ahead with the formulation of data to create a dynamic map platform covering approximately 30,000km of Japanese expressways and vehicle roads.

3.5 Anticipatory data provision

Anticipatory data provision is a system that assists in making advance lane changes, etc. by providing the driver and the vehicle with information that cannot be obtained from the vehicle itself, including data on accidents ahead, data on traffic congestion, and data on traffic regulations (anticipatory data).

Mitsubishi Electric is working towards the practical realization of anticipatory data provision, conducting test course trials in the provision of support for lane changes by providing autonomously operating vehicles with anticipatory data for each lane using road-to-vehicle communication.

3.6 Technological synergy × open innovation: blazing a path to the future

Autonomous driving technologies necessitate the integration of diverse and wide-ranging element technologies. The Mitsubishi Electric Group is advancing initiatives to create innovative technologies, for example by forming project teams across different divisions of the company and promoting open innovation that crosses industry boundaries.

In March 2017, we successfully developed a technology able to efficiently create and modify high-precision 3D maps using AI and Mitsubishi Mobile Mapping System (MMS) technology.

In October 2017, we formed a partnership with Holland's HERE Technologies. By bringing together HERE's global high-precision maps and cloud-based position data services and Mitsubishi Electric's high-precision positioning technologies, our aim is to provide user-friendly position data services.

The Japanese government is seeking to realize fully-autonomous driving with no human input on expressways by 2025. By means of these initiatives, the Mitsubishi Electric Group is contributing to the realization of a society that allows safer, more secure and more comfortable lifestyles.

4. Future Initiatives

In seeking to realize autonomous driving systems, in addition to considering the safety, security and comfort of passengers, we believe that it will also be important to realize vehicle control that is able to reproduce natural driving, operating the vehicle as an experienced driver might. This would further boost the sense of security and the comfort of the passengers.

Given this, Mitsubishi Electric is advancing development that will enable us to integrate self-sensing driving and network-based driving with a high degree of sophistication. We are engaging in a process of trial and error in order to ensure reliability in actual road environments by means of tests on public roads using our experimental vehicles.

Changes in the environment of the domestic and overseas automotive industry are accelerating, and one of the demands on us is to further advance and distinguish driver assist and autonomous driving technologies. Against this background, it is our goal to make our automotive society and even more appealing one through the advanced technologies that only Mitsubishi Electric is able to realize.

In these ways, the Mitsubishi Electric Group will continue to contribute to solving the wide range of social issues targeted by the SDGs, with innovative technologies and services that help realize sustainable society.

FY2018 JICA Knowledge Co-Creation Program: Improving ICT Policy Promotion Skills Utilizing Standards

— Overcome challenges by deploying ICT infrastructure corresponding to the situation —

International Cooperation Department
The ITU Association of Japan

Photo 1: Courtesy visit to MIC

For 12 days from January 24th to February 8th, 2019, the ITU Association of Japan held a group training course on behalf of the Japan International Cooperation Agency (JICA).

In this training course, we aimed to promote understanding of the importance of new approaches to problem-solving and international standardization of ICT policies using international standards such as government procurement and advanced technology trends, and – through case studies related to the development of ICT infrastructure in Japan – to study and share appropriate ICT solutions to the issues faced by every country (ICT infrastructure development, procurement proposals, social issues, etc.).

With the cooperation of the Ministry of Internal Affairs and Communications during FY2016 through FY2018, this is the third year in which we have been able to hold this event, which was attended this year by ten trainees from seven different countries: Ecuador, Indonesia, Laos, Myanmar, Pakistan, Rwanda and Thailand.

The training started with a series of lectures on the Japanese government's policies relating to ICT standardization, radio wave utilization and telecommunication business. This was followed by lectures and presentations on problem analysis methods (PCM), country reports, ITU standardization trends, the activities of Japan's standardization organizations, the standardization activities of related companies and groups, and individual reports, as well as visits to related facilities.

There were three lectures relating to Japan's communication policy and standardization policy, on the topics of ICT standardization (Ministry of Internal Affairs and Communications), radio policy (Ministry of Internal Affairs and Communications), and telecommunications policy (Ministry of Internal Affairs and Communications).

With the aim of using PCM (project cycle management) to extract the elements of standardization activities and conduct a preliminary study of Japan's activities, the trainees saw a lecture on PCM analysis methods, identified standardization-related issues in the country of each trainee, and held group discussions to share the knowledge level among the trainees. This PCM lecture was also delivered just before the announcement of each of the individual reports by the trainees, and in group discussions we gave each trainee the opportunity to draw up problem-solving methods for the standardization of ICT in their own countries, and summarize the state of progress in standardization activities in their own countries.

There were also two lectures relating to *Standardization in ICT Fields and ITU-T / Towards Global Standardization in TTC* (Telecommunication Technology Committee) and *Standardization of Radio Systems* (ARIB: Association of Radio Industries and Businesses).

Regarding the activities of organizations reflecting the standardization of actual equipment, there was a lecture from TELEC (Telecom Engineering Center) on *Certification System for Radio Equip-*

Photo 2: PCM Drill

ment in Japan, and a series of lectures from HATS Conference: *Overview of HATS, IP Camera Security as IoT Sensor*, *The History of Facsimile Interconnectivity Testing Activity,* and *Interoperability Test Program for Optical Access System*.

Regarding the standardization activities of communication business groups and the like, there were lectures on *KDDI's ICT Service and R&D Technology Strategies* (KDDI), *Global Standardization of Mobile Communication Systems* (NTT Docomo), and *Introduction of Standardization on Future Network* (NTT).

Among the companies and organizations that conducted facility tours and lectures, we arranged a visit to TELEC (Telecom Engineering Center), where the trainees gained an understanding of the importance of standard certification by attending a lecture on *Certification System for Radio Equipment in Japan* and viewing standard certification facilities for radio equipment. At National Institute of Information and Communications Technology (NICT), the trainees viewed an exhibition of the NICT's latest research, and saw a lecture on *NICT's R&D and Standardization* activities. At the Fujitsu Kawasaki Factory, the trainees visited the Fujitsu showroom (technology hall) and saw a lecture on *Standardization Activities in Fujitsu*. At the NHK Broadcast Center, the trainees were shown around the Technical Operation Center (TOC) and Cross Media Station, and saw lectures on *Setup of Digital Terrestrial Television Broadcasting Network, The Roles and Convergence of Broadcasting and Communications*, and *The Current Status of Digital Service*. At the HEMS Interoperability Test Center at Kanagawa Institute of Technology, the trainees were shown ECONET Lite equipment in an actual smart house, and saw a lecture on *Current Status of Smart-Houses*. At the Tokyo offices of Hitachi Kokusai Electric, the trainees observed production lines and communication equipment (administrative radio for disaster prevention, digital radio for businesses, etc.), and saw lectures on *High-Precision Foreign Object Debris Detection System for Runway - Linear Cell Radar System* and *VHF Band Wireless Broadband Access*.

During the course of this training, we also arranged Japanese cultural visits for the trainees. At the early stage of the event, the trainees visited the Tokyo Tower, and at the end of the training, we arranged English-speaking volunteer guides for a visit to the Meiji Shrine and the Harajuku district (Takeshita-dori).

On the final day, each trainee presented an individual report. These reports included a discussion on the current state and future prospects of standardization in each trainee's home country, which were summarized using PCM methods or the like, and resulted in lively discussions on the progress of ICT standardization in each country.

This training course was highly rated by the trainees, but at the ITU-AJ, we hope to develop this event into a more satisfying experience by gathering the opinions and requirements of trainees based on their evaluations of the lectures, text materials and site visits, and analyzing the results to clarify where improvements can be made to the course from next year.

Photo 3: Closing Ceremony

= A Serial Introduction Part 3 = Winners of ITU-AJ Encouragement Awards 2018

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.

Tomoyuki Shimizu
KDDI Research, Inc.
tm-shimizu@kddi.com https://www.kddi-research.jp/english
Fields of activity: Cable broadband and broadcasting, ITU-T SG9

Future of Cable TV – 4K/8K, Gigabit Broadband, and Integrated Services

I am greatly honored to receive the ITU-AJ Encouragement Award. I would like to thank all those who have supported me in our activities in ITU-T Study Group 9.

I have been involved in ITU-T SG9 standardization activities as a rapporteur since 2017. ITU-T SG9 has assumed a key role in international standardization of cable broadband and broadcast services for the past several decades. Most recently ITU-T SG9 has focused its efforts on 4K/8K, gigabit broadband, and integration of OTT (Over the Top) services.

4K/8K is a key feature of next-generation cable broadcasting and has generated enormous interest from Japan and other countries. Over the past ten years, we have promoted ITU-T Recommendations derived from 4K/8K-related domestic standards in Japan, including Rec. ITU-T J.183 (revision) and J.383.

Regarding gigabit broadband, the U.S. has submitted a draft of 5th-generation DOCSIS specifications, cutting-edge cable broadband technology. One of my roles is to coordinate consent to this proposal, a critically important task since because upgrading to gigabit broadband is a significant issue in cable industry of many countries.

OTT services have emerged as a hot topic in ITU-T. ITU-T SG9 is keenly interested in defining how OTT will be integrated with cable services. As an initial step, we have launched a new work item called J.cable-ott, which illustrates a viable integration path between cable and OTT services in terms of subscriber authentication and billing.

Cable broadband and broadcasting are becoming increasingly important in this new era of gigabit Internet and cloud-based integrated services. I hope to contribute to next-generation cable services and applications through SG9 activities.

Maho Nakagawa
Fujitsu Limited
nakagawa.maho@jp.fujitsu.com www.fujitsu.com
Fields of activity: Human Resource Development / Education

ICT Human Resource Development and the Deployment of the Inter-university Pilot Cloud System in Myanmar

I am truly honored to receive the ITU-AJ Encouragement Award, and gratefully acknowledge the advice and contributions from all members involved in this work.

Over the past four years I pursued two objectives in Myanmar: first from the end of 2014 I was involved in an ICT human resource development project, then beginning in 2016 I participated in an APT program to build an inter-university pilot cloud project.

There are growing expectations for ICT in Myanmar as the country achieves rapid socio-economic development. But most ICT-related courses taught at universities were theory studies, so providing students with practical trainings was a critical challenge. To meet this need, Fujitsu established Fujitsu ICT Laboratory to deliver lectures highlighting practical training at a leading university in Yangon, and provided Training of Trainers (TOT) programs. We also contributed to ICT higher education throughout Myanmar by supporting construction of an inter-university pilot cloud platform that can be accessed by universities in remote rural areas.

Professors at the university integrated Fujitsu's practical training content into their standard curriculum, and are now considering how to make the best use of the cloud platform. These are voluntary and additional effort but essential activities to integrate these new educational resources into real situations. I have learned a great deal that we certainly did not envisage at the start of the project.

In tackling new projects in the future, we should carefully consider local conditions that are in a constant state of flux and map out an appropriate approach for seamless integration into the local educational system. I am committed to sharing and discussing ideas with stakeholders in Myanmar toward the goal of organizing additional projects in the years ahead.

Akira Negishi
Japan Broadcasting Corporation (NHK)
negishi.a-ky@nhk.or.jp https://www3.nhk.or.jp/nhkworld/
Fields of activity: World distribution of international channel

Experience Gained through ITU-R

It is a great honor to receive the ITU-AJ Encouragement Award, and I sincerely thank the ITU-AJ and all those who supported my candidacy.

My first involvement with the ITU-R was in July 2015, when I participated in the SG6 (Broadcasting Service) block meeting in Geneva. I helped draft a report regarding sharing studies between DTTB and mobile services, as well as a recommendation regarding the Emergency Warning Broadcasting System.

After that, I have attended the 5th APG meeting for WRC-15 (World Radiocommunication Conference). My assigned task was to safeguard broadcasting services from additional spectrum allocations to mobile service, and spectrum extension to Earth exploration-satellite service. Representing broadcasters and being a member of Japan's delegation was a novel experience.

In November 2015, I participated in WRC-15 with only a few months of ITU-R experience under my belt. But this 4-week conference provided an invaluable opportunity to grasp the difficulties of achieving global harmonization of the spectrum allocation due to the different objectives and expectations of countries and industries.

In 2016, I joined Study Group 4 (Satellite Service) to finalize a recommendation regarding UHDTV satellite transmission. The purpose was to produce an international transmission system standard for 4K/8K satellite broadcasting in Japan, so-called ISDB-S3. With the DVB delegation's cooperation, the recommendation was approved and issued in December 2016. At the same time, I was also involved in the process of drafting a handbook dealing with the introduction of terrestrial digital broadcasting. Much useful information from the deployment in Japan was included in the document.

In 2017, I was transferred to another department in the company, and my job assignment shifted from ITU-R to worldwide distribution of our international channel. The experience from ITU-R was very profitable and helped immensely in my current work. Although I was involved in ITU-R activities for only a brief period of time, I am honored to have contributed to its mission. I am committed to pursuing this work from different angles to maintain Japan's leading role in broadcasting technology, and contribute to further development of the broadcasting industry as a whole.

Kei Harada
Nippon Telegraph and Telephone Corporation
kei.harada.by@hco.ntt.co.jp http://www.ntt.co.jp/index_e.html
Fields of activity: IoT, service platform

High Interoperability with oneM2M

I am honored to receive the ITU-AJ Encouragement Award. From mid-2016, I've been engaged in standardization at oneM2M, which is a partnership project established in 2012 with the goal of developing an horizontal IoT service platform for connecting data from many different industrial domains. It was my task to specify the interworking rules between OMA GotAPI and oneM2M specifications to facilitate interoperability of oneM2M.

Interoperability is crucial to maximize the value of data and create new services. Open innovation and collaboration are far more pervasive which requires technology capable of interconnecting data easily and consistently—in other words, high interoperability systems are essential.

oneM2M creates specifications with high interoperability and many liaison relationships with other organizations such as ITU-T, 3GPP, and OMA. In order to promote the concept and direction of oneM2M, I proposed a number of contributions to enhance the interoperability of oneM2M.

For telcos and service providers, standardization is just a means, not the end goal. It is more important that we implement one effective specification of oneM2M rather than propose multiple contributions to it. While standardization specialists may have different opinions, it is vitally important that we understand each other's duties and forge smooth relations among specialists to achieve our respective goals. There are many types of people involved in oneM2M, but we found a common goal: the spread of oneM2M. Penetration of oneM2M has been achieved through hackathons, seminars, white papers, pilot projects, exhibitions, and so on. In the future, I would like to further contribute to these activities while attending standardization meetings and proposing contributions.

New Breeze　平成三十一年四月十日発行（年四回一、四、七、十月の十日発行）第三十一巻第二号（通巻百二十二号）

定価　一冊　一、六二〇円（本体価格　一、五〇〇円、消費税　一二〇円）　年間購読料　六、四八〇円（本体価格　六、〇〇〇円、消費税　四八〇円）

ITU
The ITU Association of Japan