New Year Messages

From the Minister for Internal Affairs and Communications, Secretary-General of ITU, President of ITU-AJ

Special Feature

Initiatives Aimed at the Spread of Local 5G

Local 5G to Accelerate DX — NEC UNIVERGE RV1000 Series enables system construction at affordable price range —

C O N T E N T S

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.

2024 MIC Minister's New Year's Greeting

Takeaki Matsumoto
Minister of Internal Affairs and Communications

Happy New Year's to all of you. My name is Takeaki MATSUMOTO, and I was reappointed Minister for Internal Affairs and Communications in December, 2023.

The Ministry of Internal Affairs and Communications (MIC) forms the core of our government, supporting daily life for our citizens in many areas, including local economies, elections, fire fighting, information and communications, broadcasting, the postal system, public-sector evaluation and statistics.

As the Minister of Internal Affairs and Communications, I will put all of my effort into fulfilling my duty, working to implement our policies for all citizens of Japan.

Enhancing information and communication infrastructure, promoting regional digital transformation

We are enhancing information and communication infrastructure to support regional digital transformation, as part of implementing the "Vision for a Digital Garden City Nation."

We are completing integration of 5G networks in urban and regional areas, completing and maintaining fiber-optic networks in remote areas, distributing data centers regionally, and completing fiber-optic submarine cable networks.

To enable dramatic increases in use of radio in society and the economy, we are also studying allocation of new frequencies, and how to introduce non-terrestrial networks seamlessly.

To create solutions to regional issues using these types of digital infrastructure, we are also implementing advanced digital technologies such as automated driving.

To realize a society in which everyone can enjoy the benefits of digital transformation, we are advancing support for use of digital technologies by populations such as the elderly, improving literacy across all generations, and promoting barrier-free access to information for those-with-disabilities.

We are also promoting measures dealing with abuse and defamation on the internet, to streamline provision of aid to victims through consistent application of the "Act on the Limitation of Liability for Damages of Specified Telecommunications Service Providers," promoting efforts by platform operators to accelerate and improve transparency of efforts, and strengthening systems for education and consultation.

We are also promoting policy conforming to changes in the environment surrounding information and communication, including discussion in the Information and Communications Council of how communication policy should change with the times. We are conducting comprehensive review of necessary revisions to related legal systems, such as the "Telecommunications Business Act," and the "Act on Nippon Telegraph and Telephone Corporation, etc."

Regarding broadcast systems in the digital era, to provide broadcasts with reliable information in the expanding information space, we will need to promote policies that support business sustainability and fulfill the overall role of broadcasting with expanding usage of the internet, and also promote further study of these issues.

Regarding use of the internet by NHK, we are taking necessary measures including preparing systems and conducting studies toward suitable broadcast content production environments.

Promoting advanced initiatives to enhance competitiveness and cooperation internationally

Amid rapidly changing international conditions, we plan to ensure economic security in the information and communications and postal domains, strengthening international competitiveness and promoting deeper international cooperation.

Last year, the Internet Governance Forum was held in October, and the G7 leaders held a Digital and Tech ministers' meeting in December, compiling the "Hiroshima AI Process Comprehensive Policy Framework," which was the first international policy framework on generative AI. Expansion of results of the Hiroshima AI Process in international society will promote international cooperation in implementation of reliable AI and the implementation and maintenance of a free and open internet.

We are also working strategically on forming international rules with organizations such as the Universal Postal Union (UPU), the International Telecommunications Union (ITU), and the Asia-Pacific Telecommunity (APT), which have many directors appointed from Japan.

We are promoting overseas expansion of our technologies, systems and services in MIC-related fields: in digital infrastructure such as 5G and Open RAN and also broadcast content, postal services, fire fighting, and administrative consulting. These technologies excel in safety, reliability and security.

Regarding "Beyond 5G," which is the next-generation information and communications infrastructure, we are utilizing National Institute of Information and Communications Technology (NICT) funding to support R&D and international standardization of all-photonics networks, including implementation in society and expansion outside of Japan.

We are also working on data-related issues and promoting R&D on important advanced technologies such as AI, space development, and quantum communication.

We are promoting cyber-security measures such as HR training and data analysis to account for recent increasing risk of damage due to cyber attacks.

In particular, based on revisions to the NICT Act established in an extraordinary session of the Diet last year, we continue to promote and expand NICT's survey of vulnerable IoT devices, and contribute to further measures to strengthen IoT device security in collaboration with a wide range of communications operators, manufacturers and other related-parties.

MIC is also working to accelerate policies related to economic measures.

In public relations, we are also working to promote a deeper understanding of MIC policies.

Conclusion

Please allow me to conclude my New Year's greeting by wishing you all health and much happiness in the coming year!

2024 New Year Message

Doreen Bogdan-Martin
ITU Secretary-General

I send my greetings and best wishes to all members of the ITU Association of Japan for a joyful and prosperous year ahead. I also wish to express my gratitude for your diligent efforts in our many successful collaborations throughout the past year.

Together we are making progress on our shared goals of sustainable digital transformation and universal connectivity. And I believe we are poised for even greater achievements in these areas in 2024.

We have much to celebrate, from the successful AI for Good Summit in July to our inaugural SDG Digital event in September ahead of the UN General Assembly meetings, where we outlined a digital-driven action plan to accelerate the UN Sustainable Development Goals.

Japan has shown exceptional leadership on the global stage, promoting digital progress through its G7 presidency.

Technology was a central theme at the 49th G7 Summit held in Hiroshima in May. I was pleased to see the initiation of the Hiroshima Artificial Intelligence (AI) Process to set common rules for governing AI and to foster its ethical development.

On October 30, G7 leaders affirmed their commitment to the Hiroshima AI Process in a statement welcoming the guiding principles and code of conduct. They pledged to manage risks from generative AI models to protect individuals, civil society, and rule of law principles, with the goal of shaping an inclusive governance for artificial intelligence.

Both ITU and the G7 are dedicated to creating a more equitable, secure, and sustainable digital world for generations to come. The groundbreaking work under the G7 Hiroshima AI Process will benefit all the Member States ITU serves as the UN agency for digital technologies.

I also commend Japan for hosting the Internet Governance Forum this year in October.

In his opening IGF address, Prime Minister Fumio Kishida highlighted the transformative potential of generative AI. I share his enthusiasm for the positive impact AI can have on our shared digital future and support his call for a balanced approach between seizing AI's opportunities and mitigating its risks.

We must also keep in mind that joining the AI revolution requires being part of the broader digital revolution in the first place.

2.6 billion people are still offline across the world, with many of them living in the Global South.

Several countries — especially developing and least developed countries — are struggling to build capacity to respond to the challenges posed by AI while striving to seize digital opportunities whenever and wherever possible.

To better understand each country's 'AI readiness,' ITU is surveying its 193 Member States for a comprehensive overview. We also plan to integrate AI capacity support into our digital transformation offerings in collaboration with partners like UNDP, particularly in countries with low technological capabilities.

ITU will continue to contribute to global AI governance, in particular in the key area of technical standards, which is a prerequisite for effective implementation of safeguards.

With only a few years left to deliver on the UN Sustainable Development Goals by 2030, success hinges on our ability to make progress on strategic objectives, as outlined in the SDG Digital Acceleration Agenda launched by ITU and UNDP at the SDG Digital event in September.

As the UN Secretary-General said, the SDGs aren't just a list of goals. They carry the hopes, dreams, rights and expectations of people everywhere.

One number captures the significance of this moment more than any other: 70% of the SDG targets directly benefit from digital technologies.

Where do we go from here? I have always believed strategic partnerships and diverse financing can help advance a range of objectives. That is why ITU was proud to announce new commitments from private sector, finance bodies, international and philanthropic foundations at SDG Digital.

These include new commitments to our Partner2Connect Digital Coalition, which now aims to mobilize 100 billion USD in pledges by 2026. I thank entities in Japan for their pledges worth 2.72 million USD supporting innovative projects to expand connectivity and accelerate digital transformation globally. And I encourage others to follow their example.

I would like to congratulate Seizo Onoe-san for a successful first year in his leadership of ITU's Standardization Bureau.

Digital technologies are on top of the global agenda. As we look forward to the next year's Summit of the Future in September and Japan hosting Expo 2025, I believe we have a once-in-a-generation opportunity to shape the digital world we want — one that empowers everyone, everywhere.

Happy New Year!

New Year's Message

Tetsuo Yamakawa
President
The ITU Association of Japan

Best wishes to all in this New Year!
Russia's invasion of Ukraine which began in 2022 has continued to expand in 2023 and with the outbreak of the Palestinian conflict, the concepts of peace and harmony are being questioned deeply. With continuing economic uncertainty and regional disputes, it will be critical to focus our wisdom and cooperative abilities to face these difficult conditions in order to restore stability in the world.

Last year, the ITU-AJ participated in meetings of the International Telecommunications Union (ITU) and the Asia-Pacific Telecommunity (APT), including the APT General Assembly (GA-16) and the APT Management Committee Meeting (MC-47), held in Bangkok Thailand from November 6 to 11. There, Masanori Kondo was re-elected to the position of APT Secretary General, a position he has held for three years. We celebrate this achievement and hope for the best in his efforts in the coming three years. The ITU Radiocommunication Assembly 2023 (RA-23) and the ITU World Radiocommunication Conference 2023 (WRC-23) were also held in Dubai, United Arab Emirates, from November 13 to December 15, and three vice-chair candidates from Japan were selected at the RA. The ITU-AJ also provided administrative support in Dubai for these meetings.

The Mobile World Congress (MWC) was an ICT event held in Barcelona Spain from February 27 to March 2, including a Japan Pavilion presented by 11 Japanese companies. The ITU-AJ supported international expansion of Japanese ICT enterprises through exhibits in the pavilion. Another notable event was CEATEC, which was held at Makuhari Messe from October 17 to 20, where Ukraine exhibited and presented lectures for the first time.

Within the ITU-AJ, we held our annual "World Telecommunication and Information Society" Ceremony on May 17 at the Keio Plaza Hotel, which was also streamed online. At the ceremony, Yoshio MIYADERA (Japan Radio Co. Ltd.), who drove and supported standardization of marine radio communication technologies at international organizations including ITU and IMO, received a MIC Minister's Award. The Starlink team from SpaceX also received a Special Achievement Award, with a keynote speech given by Lauren Dreyer, who came to Japan to receive the award representing SpaceX. A further 14 individuals and one organization received Accomplishment Awards, and 15 individuals and one organization received Encouragement Awards. We offer our heartfelt congratulations to all of these recipients.

For training, the APT training office held a network planning course aimed at eliminating the digital divide from October 11 to 20, inviting nine participants from nine countries. This was the first face-to-face training course in four years since COVID-19 began.

Themes of diversity and inclusion have also gained prominence recently. As ICT technologies continue to advance, I hope Japan will also expand "Diversity and Inclusion" by developing and expanding services related to 5G, beyond 5G (6G), Local 5G and AI.

With the ITU this year, the World Telecommunication Standardization Assembly 2024 (WTSA-24) will be held from October 15 to 24 in New Delhi, India. While we hope to invite the assembly back to Japan soon, the ITU-AJ will continue to collaborate with relevant parties on ITU and APT assemblies and events, adapting to requirements with flexibility based on our past experience.

Within the ITU-AJ, we will continue operation of our Japan Platform for Driving Digital Development (JPD3), which began in 2020. In February, we plan to hold a new type of course for human resource development at British Hills in Fukushima, to improve skills in international negotiation. By also publishing the online monthly, "ITU Journal," and the English quarterly, "New Breeze," inviting experts to speak at research conferences, and holding informational meetings that gather a cross-section of people involved in ITU-related businesses, the ITU-AJ will continue collaboration so that it can be a platform for interaction among the ITU, the Japanese government, and each of the supporting members.

I wish you all a sincere Happy New Year and good health in the coming year.

■ **APT General Assembly, Election of Masanori Kondo as Secretary General**

Local 5G to Accelerate DX
— NEC UNIVERGE RV1000 Series enables system construction at affordable price range —

Koichiro Fujimoto
Executive Professional, Technology Evangelist
Digital Network Business Division, NEC Corporation

1. Introduction

With the spread of digital transformation (DX), Local 5G, which enables private use of 5G next-generation wireless technology, has gained wide attention. Radio waves have thus far been allocated for use only by telecommunication carriers with the appropriate technological capabilities. The Japanese government, however, has decided that it is necessary to attract private investments and create social value in order to make effective use of radio resources, and has thus engaged new industry players.

However, due to the complexity of the technology, the system cost has remained high, preventing the widespread use of radio resources. To solve this problem, NEC delved into the fundamental question about what makes a Local 5G system easy for companies and municipalities to use. From this research, it developed a new Local 5G system called the NEC UNIVERGE RV1000 series, which enables system construction at an affordable price range. Here, I will discuss the current state of Local 5G, which is vital in accelerating DX, the features of the new product series, and its potential to promote the uptake of Local 5G.

2. The birth of Local 5G aimed at democratizing radio use

Following the computerization of information, the use of digital data has accelerated since the late 1990s along with the spread of the Internet, and the use of digital data has become commonplace both in corporate activities and in our daily lives. However, apart from the hotspot usage of Wi-Fi and similar technologies, the unrestricted use of data using wireless technology is mainly through public network systems provided by telecommunications carriers via smartphones and other mobile devices. For example, companies and municipalities have been unable to build their own wireless networks to meet their specific needs. The capital investment for mobile phone networks of telecommunication carriers, which had developed as an advanced tool originally intended for mobile communication between people, has been planned based on population density. Therefore, even today, base stations have not been sufficiently installed in uninhabited areas including mountainous and coastal regions. Likewise, radio signals cannot penetrate and be used in large and closed spaces such as factories of private companies, making it practically difficult to use them for business purposes in such locations. Also, even if equipment can be installed, as long as the network is public, it is provided under technical specifications in accordance with its service stipulations. Thus, it is difficult to provide network functions tailored to use as a private network, for example, in accordance with the needed applications for communication, transmission speed, and type and number of terminals.

In particular, in terms of network characteristics tailored to communication needs, it is imperative to go beyond the technical specifications of 4G/LTE, which has developed as a mobile phone network. We therefore compiled the ITU Vision Recommendations as technical guidelines that ITU-R should aim for in pursuing the standardization of 5G, in accordance with the generational shift that is said to occur once every 10 years (Figure 1). In particular, the three characteristics of 5G; namely, "ultra-high speed," "ultra-low latency," and "massive connectivity," have been defined as three different scenarios, and the story drawn is to achieve the three in parallel. 5G specifications have been formulated through 3GPP in accordance with this story. However, a common misconception is that these three scenarios are achieved at the same time. In reality, instead of providing all the features with one wireless resource, the idea is to create a scenario and allocate wireless resources for each desired service. In other words, the technical scenario for implementing 5G should coincide with the technical specifications in the three directions.

Along with progress in the 3GPP specifications, Japan started 5G field trials in 2017 through the Ministry of Internal Affairs and Communications (MIC) 5G Comprehensive Demonstration Tests. Initially, demonstrations were carried out mainly by telecommunications carriers and related manufacturers with the technical know-how in mobile communications. Later on, the tests developed into problem-solving type demonstrations aimed at social implementation and were carried out under the leadership of players from various industries and municipalities. As a result of the MIC demonstrations and the progress in discussions of 5G use cases by experts from industry, government, and academia, expectations have grown significantly for its use outside of residential areas, including in construction sites, farms, forests, and private factory buildings. Fortunately, as aforementioned, 5G can be applied in multiple technical scenarios, paving the way for discussions of the allocation of wireless resources other than the public networks used for smartphones for general consumers. MIC defined the term "Local 5G" to promote the democratization of radio use. And, in December
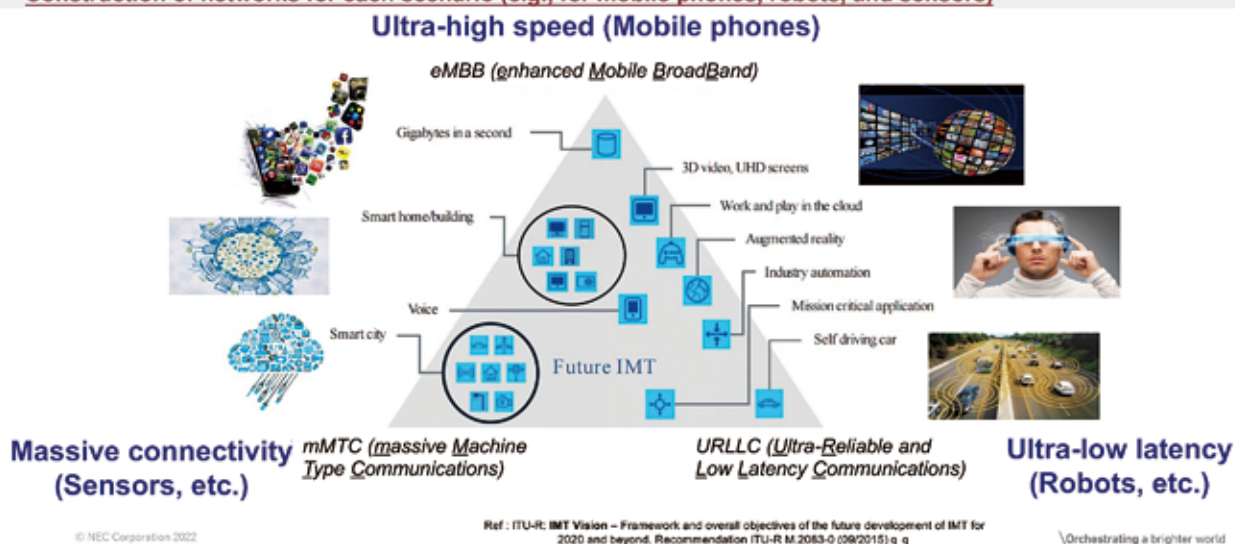
2018, the Local 5G Study Group of the New-generation Mobile Communications System Subcommittee under the Information and Communications Council started discussions on its standardization. In December 2019, millimeter-wave (28 GHz band) Local 5G was institutionalized, and a new wireless field called "Local 5G" was officially established. Further, in December 2020, Local 5G (4.6 GHz to 4.9 GHz) in the Sub-6 band, a user-friendly, low frequency band, was institutionalized and launched into full-scale use, leading to its applications in a wider range of use cases.

3. The challenge of utilizing technology designed for telecommunication carriers for the general public

As mentioned in the preceding paragraph, Local 5G was institutionalized in Japan as 5G that can be used not only by telecommunications carriers but also by companies and municipalities to meet various needs. For example, Local 5G radio waves can be used in factories within buildings as a private, wireless on-premises network. In addition, unlike for Wi-Fi and other wireless signals that do not require a license as an exception for weak radio waves, by allocating 5G radio waves as a licensing station, Local 5G enables emitting stable radio waves that cover a large area of the premises.

However, using wireless technologies in Japan requires operating them in accordance with the rules established by MIC. Even for Local 5G, a license is needed after technical verification based on the purpose of use. Also, emission of radio waves for operations must be performed by licensed radio engineers, and each user entity must assign nationally certified radio engineers within the organization to obtain a Local 5G license.

Moreover, 5G systems are equipped with mechanisms for terminal authentication as intended originally for mobile communications, as well as mechanisms to enable mobility over a wide area. Therefore, the systems are relatively large, thereby requiring significant capital investments.

NEC has developed a Local 5G system that uses the technologies it has developed for base stations designed for telecommunications carriers, an area for which it has an accumulation of technical strengths and know-how. Leveraging this technology as an innovator, NEC has been promoting value creation through Local 5G via co-creation with companies carrying out advanced initiatives in major construction and manufacturing industries. Even in the early stages, these companies were able to make relatively large investments to secure human resources, improve efficiency, and solve pressing safety and environmental issues. These initiatives have been going on for more than five years, and significant progress has been made toward practical use of the system.

4. Changes in use cases and breakthroughs in Local 5G adoption

In FY2020, MIC conducted Development Demonstrations for Realizing Local 5G Services to Solve Local Issues. In the following year, dropping the "local" in "local issues," it continued the initiative as Development Demonstrations for Realizing

Local 5G Services to Solve Issues to promote the utilization of Local 5G as a social implementation aimed at solving "issues" in various companies and municipalities. Local 5G is anticipated to be used in many areas of society, including in primary industries, medical care, disaster prevention, sports, and local communities. However, as mentioned in the preceding section, Local 5G systems are still admittedly expensive and technically difficult to deploy. Meanwhile, along with a growing understanding of its features and benefits in comparison with Wi-Fi and other wireless technologies, corporate use cases for relatively general IT applications, such as use in offices and business activities, must be expanded also for general businesses. We have received much feedback that there is a need for a system that is easy to deploy and widely affordable in order to expand use cases and make Local 5G a viable option for those companies. It has become clear that there is a need for transformation, including the characteristics of the equipment used and the cost aspects, to make a breakthrough in achieving changes in use cases and for the uptake of Local 5G in a wide range of new applications.

5. Development of base stations to make the benefits of Local 5G more accessible

In response to these changes in usage scenes and market needs, from around the second half of FY2019, NEC has concluded that it is crucial to plan and develop a widely affordable Local 5G system that meets market needs, starting with the

concept creation, in order to enable many users to enjoy the benefits of Local 5G in anticipation of its uptake. To fully leverage the strengths of wireless technology, NEC carried out studies by tapping members who have technical expertise in the development of equipment designed for telecommunications carriers, as well as engineers who have experience and knowledge on networks of user companies and municipalities.

Discussions were held on a wide range of topics, including the identification of the functions necessary to construct closed private networks from the vast functions of 5G standard technologies and the proposal of the optimal system size and architecture. In addition, communication performance, quality, size, ease of installation, cost, environmental performance, maintenance and operation, and the selection of detailed components were also tackled. These comprehensive studies resulted in the development of the NEC UNIVERGE RV1000 series (Figure 2), which enables the construction of a Local 5G system at an affordable price range. Both RV1200 for the Sub6 band and RV1300 for the millimeter-wave band were commercialized and announced in January 2022 and were widely welcomed by various quarters.

The RV1000 series includes all-in-one compact base stations that house the Local 5G base station radio unit (RU) and control units (CU/DU) in a single enclosure. In addition to reducing unit cost, it reduces the overall system implementation cost, as well as the period and labor needed for construction and installation. Its compact size and light weight also improve flexibility of

■ Figure 2: Widely Affordable Local 5G System: NEC UNIVERGE RV1000 Series
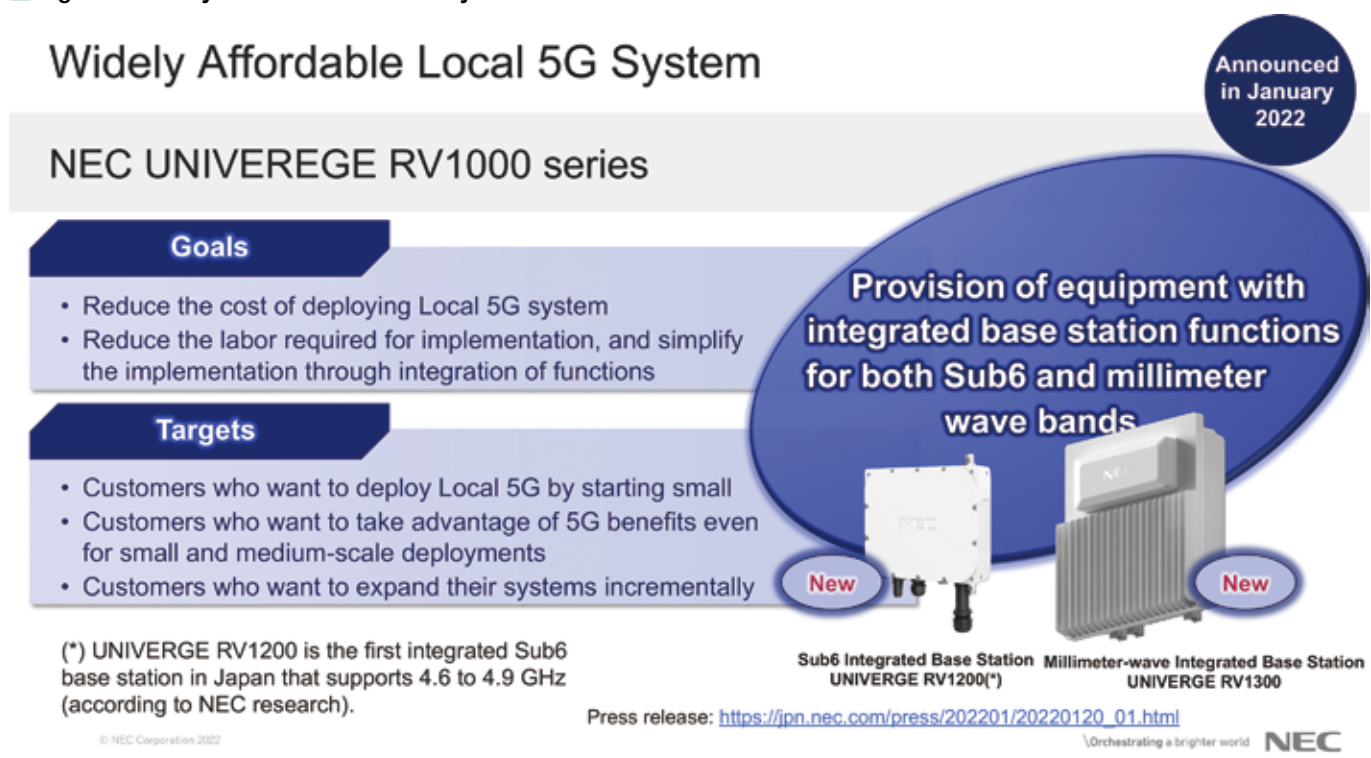
installation in various locations and significantly reduce power consumption. In particular, RV1200, which supports the Sub6 band, is compatible with all standardized frequencies (4.6 GHz to 4.9 GHz). While equipped with all functions as a base station, it is housed in a small case weighing only 3 kg and downsized to A4 paper-size. Its IP66-compliant high dustproof and waterproof performance enables installation both indoors and outdoors. In addition, it can cater to users who want to start small. After verifying the possibility of Local 5G use with a single base station, users can then scale out seamlessly to a large-scale system with more than 100 units simply by adding base stations. These features make it possible to take advantage of the high-quality communication properties of Local 5G in a wide range of environments while enabling installation with similar ease as Wi-Fi access points. Thus, the RV1000 series models have enabled us to meet the recent market needs while proactively developing and proposing practical use cases that take advantage of the benefits of Local 5G going forward.

6. Expectations for the spread of Local 5G

Modern society is facing various social issues such as the declining birthrate and aging population, environmental issues, and the COVID-19 pandemic that started three years ago in 2020. In particular, COVID-19 has brought about the need for remote communication and contactless business activities, which highlighted the delay in the use of digital technology in Japan. Therefore, accelerating DX is imperative, and there is high anticipation for the spread of Local 5G as the infrastructure for DX. Japan has established a Digital Agency. Further, under the "Digital Garden City" Initiative launched in 2021, the Japanese government has listed "early deployment of 5G" as an important goal for digital infrastructure development. As a digital infrastructure to realize a sustainable society and solve local issues, the implementation of Local 5G is a top priority as one of the most important issues the government is aiming to address.

At NEC, we believe that it is of considerable significance to be able to respond to these social issues. We will thus aim to implement a variety of use cases by providing a Local 5G system under a new concept at the right timing in response to the need for establishing the relevant social infrastructure in the future. As a social value innovator, our goal is to contribute to the utilization of DX in all sectors to create a prosperous society by continuing our activities in collaboration with relevant stakeholders.

Cover Art

Yuigahama, from Famous Views of Tokaido Road

Ikkaisai Yoshitoshi (1839-1892)

Source: National Diet Library,
NDL Image Bank
(https://rnavi.ndl.go.jp/imagebank/)

Overview of the 2023 White Paper on Information and Communications

Economic Research Office
ICT Strategy Policy Division
Information and Communications Bureau
Ministry of Internal Affairs and Communications

The focus of this White Paper on Information and Communications is "Toward Realizing the Resilient and Sound Data Flow Society for the New Era." It gives an overview of the progress of data flow, which accompanied the advancement of telecommunications infrastructure in Japan, and analyzes the current situation, challenges, and new trends in data flow and use. It also surveys initiatives toward a data flow society where everyone can enjoy the benefits of diverse services using data.

Part 1. The Current status and Issues of Data Distribution and Utilization

Chapter 1. The Continuing Acceleration of Data Distribution and Data Utilization

1. The explosive increase in data distribution

With the advancement of telecommunications infrastructure and the spread and diversification of digital services, the volume of data distribution on networks in Japan has increased exponentially. Since the COVID-19 pandemic, digitalization has progressed, which has enabled us to live without physical contact and work without face-to-face interaction. As of November 2022, the total download traffic of fixed-line broadband service subscribers increased by 23.7% year on year, and that of mobile communications subscribers as of September 2022 increased by 23.4% year on year. Globally, the volumes of data traffic and data distributed especially through mobile terminals have increased significantly and are expected in increase further.

2. The awareness of companies regarding the provision and utilization of data

While Japanese companies' utilization of data is processing, the rate of their utilization is low compared to other countries. The result of a survey of companies showed that 52.8% of Japanese companies have been "using" personal data, against 81.9% of U.S. companies.

Many Japanese companies cited "lack of methods for utilizing data" and "unclear cost-effectiveness and lack of human resources for handling data (processing and analysis, etc.)" as challenges and impediments to date usage.

Chapter 2. Concentration of Data among Platform Providers

### 1. Data Acquisition and Storage by Platform Providers

As information and communication technology advanced, and massive amounts of data are being generated and distributed, platform providers have grown rapidly as innovators that continue to generate innovative businesses and markets. Currently, various services provided by platform providers have penetrated deeply into our lives, making everyday life significantly more convenient.

At the same time, through the provision of a variety of services, platform providers have been acquiring and accumulating a huge amount of data, including attribute data, such as names, usernames, IP addresses, and data on purchasing and communication behaviors and various other activities.

2. Concerns about transparency and appropriateness of data acquisition and utilization by Platform Providers

According to the results of the survey, the percentage of respondents who were "aware" (the sum of "well aware" and "somewhat aware") of providing personal data when using services and applications was the highest in the United States (90.5%), against about 40% (42.2%) in Japan. Regarding whether or not they felt anxious about providing personal data, the highest percentage of respondents who answered they were "concerned" (the sum of "very concerned" and "somewhat concerned") was 66.5% in Germany, with 58.4% in Japan.

■ **Figure 1: Awareness and concerns about providing personal data**
(Source) Ministry of Internal Affairs and Communications (MIC, 2023), "Survey Research on Advancement of ICT Infrastructure and Flow of Digital Data and Information"
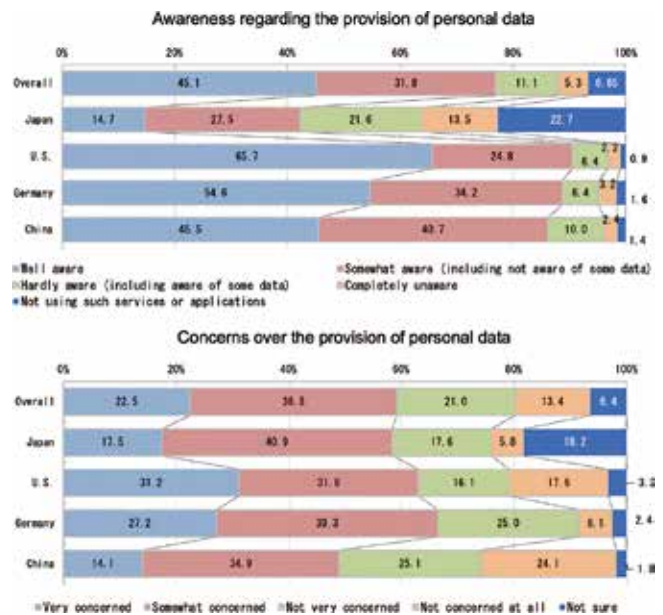
Also, for all the four countries surveyed (Japan, U.S., Germany, and China), "provider's assurance of sufficient security" was the most important consideration for users in providing personal data to platform providers.

Chapter 3. Spread of Disinformation and Misinformation on the Internet

1. The current status
(1) The spread of the attention economy
Amid the vast amount of information circulating on the Internet, to attract more attention and clicks from users, some platforms generate articles with sensational and provocative titles and content that are not based on facts but solely on speculation. This so-called "attention economy" is structured in a way that promotes the spread of disinformation and misinformation and the fueling of controversy on the Internet.

(2) Filter bubbles and echo chambers
By continuing to receive information distributed by algorithms, users tend to only gain information of their own interest. This is called a "filter bubble" that surrounds users with a film of information. Many thoughts and opinions similar to their own are concentrated inside this bubble, and opposing thoughts and opinions are eliminated (filtered out), making it difficult to notice the latter's existence. Also, as a result of communication with users of similar interests, such as in social media, users receive only opinions similar to their own. This leads to the so-called "echo chamber," where only specific opinions and ideas are amplified. By repeatedly hearing similar opinions, they tend to believe that they are correct and cannot be mistaken.

(3) The distribution of illegal and harmful information
The number of consultations received at the Illegal and Harmful Information Consultation Center, which is operated through MIC consignment, continues to remain high, with 5,745 received in FY2022.

Also, according to a questionnaire survey[1] conducted on social media users, about half (50.9%) of respondents said they had seen defamatory posts on the Internet (slander).

(4) The spread of disinformation and misinformation
A characteristic of social media platform services is that any user can easily transmit (post) information, and that disinformation and misleading information is easily disseminated. This is considered to be one of the reasons why people frequently come into contact with disinformation on social media. Also, with the spread of the attention economy, much disinformation and

misinformation created for the purpose of earning advertising revenue is circulating and being spread and amplified by bots.

Recently, there have been cases where fake images and videos created using deepfake technology have spread either unintentionally or intentionally. Already, anyone can easily make fake images simply by typing in a few words using AI, raising concerns about the democratization of deepfake technology.

2. Consumer awareness of the characteristics of social media and other platform services
The percentage of respondents who replied that they were "aware" (the sum of "well aware" and "more or less aware") of social media's tendency to expose users disproportionately to opinions and thoughts similar to their own was less than 40% (38.1%) in Japan, while 70% to 80% in the three countries other than Japan. Looking at Japan by age group, the proportion of respondents in their 50s and in their 60s and above who replied that they were "aware" was lower than that of other age groups.

■ **Figure 2: Awareness of social media's tendency to expose users disproportionately to opinions and thoughts similar to their own**
(Source) MIC (2023), "Survey Research on Advancement of ICT Infrastructure and Flow of Digital Data and Information"
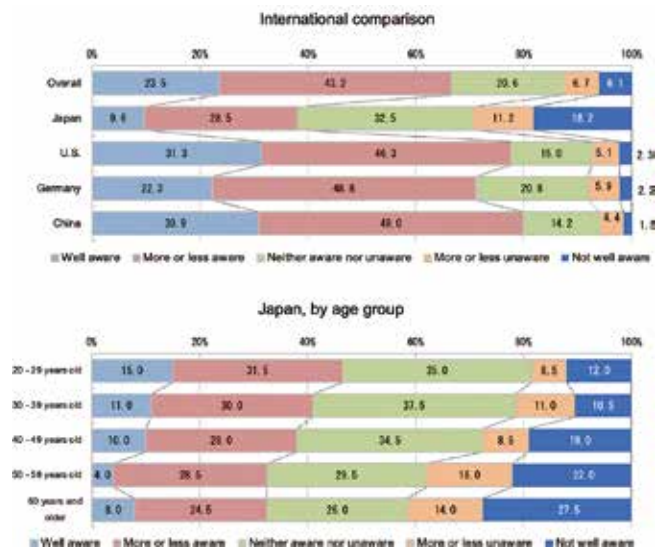
3. Digital literacy
Improving digital literacy is very important in order to prevent users from being misled by illegal and harmful information, disinformation and misinformation. A survey on the actual situation of disinformation and misinformation in Japan[2] showed that the higher their media literacy, the more likely users are to

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*1 Document 2 from the 40th session of the MIC Platform Service Study Group, "Questionnaire survey on the distribution of illegal and harmful information on the Internet" by Mitsubishi Research Institute (MRI).
*2 International University of Japan GLOCOM, "Innovation Nippon: Understanding the Actual Situation of disinformation and Misinformation in Japan and Examining Social Responses"

recognize disinformation or misinformation, and the less likely they are to spread such information.

4. The promotion of fact-checking

In regard to fact-checking, an activity aimed at verifying the authenticity of information, the percentage of respondents in Japan who answered they were "aware" (total of "aware of the meaning and specifics," "somewhat aware of the meaning and specifics," and "heard of the term") was the lowest (46.5%) among the surveyed countries. Although the awareness of fact-checking in Japan is increasing, it is still low compared to other countries.

■ **Figure 3: Level of awareness of fact-checking**
(Source) MIC, "2021 Survey on Awareness about False Information in Japan and Abroad"
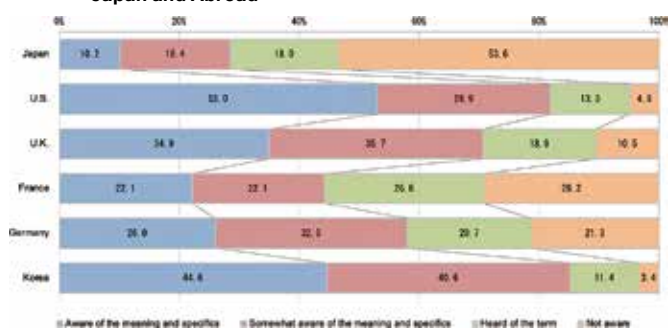
Part 2: Toward realizing a resilient and sound data flow society for the new era
Chapter 1: New trends in data flow and use

The implementation of 5G networks that enable ultra-high-speed, ultra-high-capacity data flow and the further advancement of cross-reality (XR) technology and AI are creating new trends in the approaches to data distribution and management and in the services that utilize data.

1. Web3

While issues associated with excessive concentration of data among platform providers have become apparent, Web3 is gaining attention as a new approach to data management and distribution. Web3 is considered "decentralized" because it builds a new digital economic ecosystem where independent users directly interconnect on a decentralized network based on blockchain technology, without relying on a specific platform.

This kind of Web3 environment reduces transaction costs and enables co-creating, storing, and exchanging all kinds of value across borders and platforms. It therefore has the potential to create a significant social impact, such as through the construction of new business models in the cultural and economic domains, investment and economic revitalization, and the promotion of the resolution of social issues.

2. Metaverse and digital twins
(1) Metaverse

With the advancement of communication networks and XR technologies, attention has focused on the "metaverse," which enables the transmission, experience, and sharing of new values linked to the real world and virtual space.

Metaverse is gaining recognition in Japan. Various services are being provided in the entertainment field such as music events and shopping on the metaverse. In addition, attempts have been made to utilize metaverse spaces for providing learning and employment opportunities, as well as for community building in which real cities and virtual spaces are linked.

For example, the University of Tokyo launched the Metaverse School of Engineering in October 2022 to "offer an education in the field of engineering utilizing digital technology with a focus on realizing a society where the latest information and practical engineering skills to fulfill personal goals become available to all."

(2) Digital Twins

A digital twin is a technology that builds a digital representation of a physical entity in a virtual space based on data gathered from the real world. It is expected to provide benefits such as optimized production, improved operational efficiency, reduced time and costs, and the ability to perform simulations not possible in the real world.

Digital twins began to be used mainly by users in the manufacturing industry, such as in the aviation industry and manufacturing lines, and are now being used in a wide range of fields, including national land planning, urban planning, and disaster prevention.

In the field of disaster prevention, since 2019, Shizuoka Prefecture has been promoting the Virtual Shizuoka initiative, which acquires three-dimensional information, such as on topography and buildings throughout the prefecture, as point cloud data and releases it as open data. The prefectural government compares and analyzes information from Virtual Shizuoka and aerial photographs taken in the past with 3D data measured by drones at points where landslides occurred during disasters. In the landslide disaster in Atami City that occurred in July 2021, data were used for early assessment of damage and prevention of secondary disasters.

3. Generative AI
(1) Trends in generative AI

Generative AI technology, which is used for the purpose of generating and creating information, an area traditionally dominated by humans, has been rapidly developing.

OpenAI announced GPT-3, a large-scale language model with 175 billion parameters, in May 2020, ChatGPT chatbot based on GPT 3.5 in November 2022, and GPT-4 in March

2023. In 2022, prompt-based image generation AI (also called text-to-image AI), which generates images with text entered by users, was launched, enabling the use of AI to draw images for humans. Other generative AI for a variety of other purposes have been released, including AI that creates program source code and AI that composes music from text, under human instructions.

(2) Discussions on generative AI

The negative aspects of generative AI, however, are becoming apparent, such as the unintentional or intentional spread of fake images and videos created using it, causing violation of the interests and rights of others and social disruption. With image generation AI readily available, anyone can easily create and spread high-quality fake images. Also, it has been pointed out that it may be causing infringement of intellectual property rights and an economic impact on artists, illustrators, and other content creators.

In addition to stipulating the terms and conditions for use by the companies that provide AI services, it is necessary to ensure that these terms and conditions are properly conveyed to users and to encourage the ethical use of services based on those stipulations.

Also, in regard to multilateral cooperation on the handling of generative AI, discussions were held at the G7 Digital and Technology Ministers' Meeting held in Takasaki City, Gunma Prefecture, in April 2023 on the "Promotion of responsible AI and AI governance." Through the G7 Digital and Technology Ministerial Declaration adopted at the meeting, an agreement was reached on an action plan to promote global interoperability of AI governance and to hold a forum for discussion of generative AI as soon as possible.

Furthermore, at the G7 Summit held in Hiroshima City in May of the same year, Heads of States shared a recognition of the importance of international discussions on AI governance and of the interoperability of AI governance. A summit level agreement was reached to establish the Hiroshima AI Process by the end of the year to discuss generative AI.

Chapter 2: Toward realizing a diverse data flow society

As we have seen, with the advancement of communication infrastructures and the spread of smartphones, various digital services utilizing data have become indispensable to our lives. New forms of data utilization, such as the metaverse and digital twins, are attracting attention and are expected to contribute to resolving various social and economic issues in Japan, including regional revitalization, disaster prevention, and the realization of diverse work styles.

In order to promote the safe and appropriate distribution of data and realize a society in which everyone can enjoy the benefits of data utilization, it is important to promote initiatives centered on the following four axes: (1) resilient telecommunications networks supporting data distribution; (2) early realization of Beyond 5G supporting ultra-high-speed, ultra-large-capacity data distribution; (3) contributions to standardization and development of international rules, and (4) realization of a diverse and sound information space.

■ **Figure 4: Crucial initiatives toward realizing a society where everyone can enjoy the benefits of data utilization**
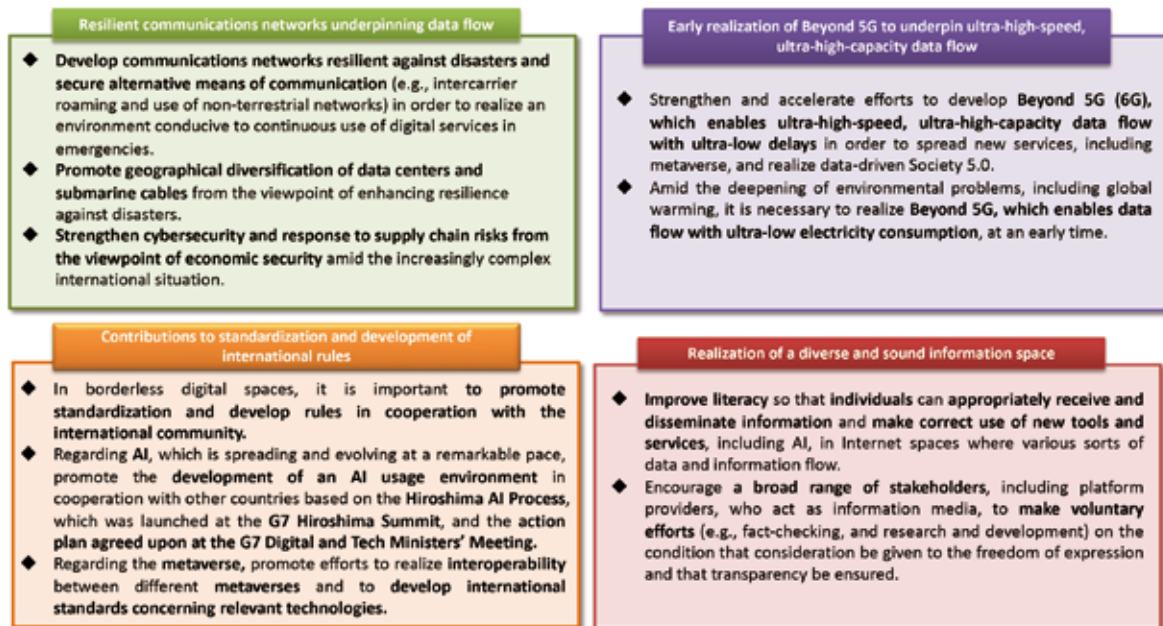
= A Serial Introduction Part 2 =
Winners of ITU-AJ Encouragement Awards 2023

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.

Akihiro Shoji

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Fields of activity: IT human resource development

Developing globally qualified IT human resources in Bangladesh

I am very honored to receive an ITU-AJ Encouragement Award and am very thankful to the association and everyone who has provided guidance and support.

I have been working in Bangladesh, in South Asia since 2008, for Information Technology (IT) human resource development. In order to establish a standard for human resource development in the country, I have been involved in advocating and supporting introduction of a national IT examination from Japan, the Information Technology Engineer Examination (ITEE) in 2013, and in supporting its subsequent dissemination and utilization.

Bangladesh was part of India until 1947 and initially became independent as East Pakistan. Later, an independent country emerged as Bangladesh in 1971. The country has yet achieved recognition and neither the IT human resources nor the IT industry can claim to be able to compete fairly in the global market. The Japan International Cooperation Agency (JICA) has been supporting development of its capabilities and promoting Bangladesh internationally, including its IT human resources and IT industry. As a member of JICA, I have been particularly focusing on human resource development.

From September 2023, I will be involved in a new JICA project that is starting in Bangladesh, providing technical support to mid-level and above engineers in the Bangladesh IT industry, helping the country's IT companies advance from small and medium-sized companies to global companies that can compete on a par with the global market.

The global market is fiercely competitive, but I will continue to support the country to act effectively in the world and systematically develop its human resources based on the technology and knowledge that Japan has already acquired. I hope that awareness of the keywords "Bangladesh IT human resources and IT industry" will increase, and I look forward to working on further Japan-Bangladesh collaboration initiatives in the future.

Yuji Suzuki

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Fields of activity: 3GPP TSG SA WG6

Standardisation to accelerate application enablement

It is a great honour to receive the ITU-AJ Encouragement Award. I am grateful to ITU-AJ and all who have supported my work, especially 3GPP SA6 delegates and my colleagues at NTT DOCOMO.

I joined 3GPP SA6 in October 2020. SA6 has been responsible for specifying solutions for mission critical communications since its inception in 2014. During Release 15, it expanded its scope to specify application frameworks and enablers such as CAPIF (Common API Framework) and SEAL (Service Enabler Architecture Layer), which provide functions available to applications outside 3GPP.

In SA6, I worked as a rapporteur for SNAAPP (Release 18), which aims to enhance the authorisation mechanisms for API invocation. There were many issues to discuss in creating a specification, but thanks to all the support from SA6 delegates and my colleagues, we successfully completed our SNAAPP work in the SA6#55 meeting, which was held in Berlin, Germany in May 2023. I hope that this technology will enable end users to

flexibly control permissions for API invocations that might affect their service experience or privacy, which will make such API invocations more secure and convenient.

I also actively contributed to EDGEAPP, which aims to specify application enablers to support edge computing. In Release 18, we enhanced EDGEAPP features in different aspects, including roaming (where device stays in a different network operator's service area) and federation (where multiple edge computing service providers are involved to serve consumers).

SA6 started Release 19 study and work in August 2023. NTT DOCOMO is proposing a new Release 19 work item, SNAAPP_EXT, to provide external application developers with useful information regarding API development. SA6 has also discussed many other topics to be handled during Release 19, including enhancements to EDGEAPP. I am looking forward to seeing outcomes of our standardisation activities in the market shortly, and I hope that these technologies will contribute to progress in the telecommunications industry.

Satoshi Yamaguchi

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Fields of activity: Next G Alliance

Activities in Next G Alliance for the future 6G Standardization

I am honored to receive this encouragement award from the ITU-AJ and grateful to the association and those who have provided guidance and support.

Since March 2022, I have attended the meetings of the Next G Alliance (NGA), which was launched by the Alliance for Telecommunications Industry Solutions (ATIS) in late 2020. The NGA aims to advance North American wireless technology leadership over the next decade through private sector-led efforts in association with government stakeholders. It currently focuses on developing the 6G Roadmap and various white papers.

In an NGA white paper, we were able to propose a topic that is being discussed in Japan: "Orchestration in Disaggregated Architecture"; and include the content in terms of "end to end", "openness", and "management functions". The white paper is

available on the NGA website and could be used as a reference for future 6G standardization.

I also presented lessons learned through activities in the NGA at a public seminar in Japan, organized by the Telecommunication Technology Committee (TTC). We were able to hold a lively Q&A session at this presentation, and we realized that the NGA activities attract a lot of interest.

Currently, I continue to attend NGA meetings considering specific requirements in response to the recommendation, "Framework and overall objectives of the future development of IMT for 2030 and beyond". I will do my best to contribute to 6G standardization through the NGA and other Standards Development Organizations (SDOs) in Japan.

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