Chapter 7

ICT Policy Directions

Section 1 Comprehensive Strategy Promotions

1. Promotion of National Strategy

The Basic Act on the Advancement of Utilizing Public and Private Sector Data was promulgated and put into effect in December 2016 for the purpose of allowing the national government to comprehensively and efficiently develop an environment for the better utilization of public and private sector data. The Cabinet decided at its meeting in May 2017 the "Declaration to be the World's Most Advanced IT Nation Basic Plan for the Advancement of Utilizing Public and Private Sector Data" from the perspective of taking world leadership in creating a model of a Society Fully Utilizing Public and Private Sector Data where people can enjoy true affluence.

In June 2017, the Cabinet decided the "Growth Strategy 2017," which indicates the future direction of ICT policy by clarifying concrete measures to be focused on for achieving further growth of Japan, such as the development of a foundation and system for data utilization, promotion of use of individual number cards, and realization and utilization of the 5th generation (5G) mobile communication system.

2. Promotion of MIC's ICT Comprehensive Strategy

(1) Promotion of Introduction of ICT in the Entire Society in View of 2020

Envisaging sustainable growth after the 2020 Tokyo Olympic and Paralympic Games, MIC has been deliberating the establishment and implementation of an Action Plan at its Conference on the Promotion of Introduction of ICT in the Entire Society in View of 2020. The Action Plan specifies goals, detailed content and schedules for each sector, including the development of a free Wi-Fi environment, sophistication of multilingual voice-based translation systems, overseas distribution of broadcast content to communicate the appeals of Japan, promotion of the use of 4K/8K and digital signage, realization of the 5G mobile communication system, utilization of open data, and cybersecurity measures.

(2) New Information and Communications Policy in View of the IoT and Big Data Era

In September 2015, MIC consulted with the Information and Communications Council regarding the new information and communications policy in view of the IoT and big data era, and the third interim report was compiled in January 2017. This report clarifies goals, responsible entities, and schedules for concrete measures to achieve the data-driven economy, and the IoT Comprehensive Strategy specifying these matters for each layer was compiled.

In October 2015, the IoT Acceleration Consortium was established with the aim of building a system for promoting the development and demonstration of technologies and the creation of new business models to facilitate IoT use in government-industry-academia collaboration amid global changes in industrial structures being brought about by the advancement of IoT, big data and AI, etc.

(3) Promotion of IoT Use and Data Utilization

A. Promotion of IoT Use

(A) Project to Support Creation of IoT Services (Familiar IoT-related Project)

In accordance with the aforementioned interim reports (the first to third versions), the "New Information and Communications Policy in View of the IoT and Big Data Era," compiled by the Information and Communications Council, MIC has been striving to promote data utilization through developing rules based on regional experiments on IoT services. Specifically, the respective responsible entities consisting of local governments, universities, and user companies carry out empirical projects on leading IoT services in sectors closely related to everyday life, such as family life and food, to identify problems to overcome, create reference models for solving such problems, and clarify rules necessary for promoting data utilization.

(B) Support for IoT Testbed Projects

The National Institute of Information and Communications Technology (NICT) offers financial assistance for part of the funds necessary for the development of IoT testbeds and regional data centers. This is for the purpose of developing testbeds used for the demonstration of new telecommunication technologies to realize IoT and promoting decentralization of data centers that play a significant role in distributing large amounts of data.

(C) Taskforce to Promote Regional IoT Implementation

Ahead of full-scale commercialization of IoT or other technologies, MIC started to hold the Taskforce to Promote Regional IoT Implementation in September 2016 to disseminate the outcomes of past experiments through-

out Japan. The Taskforce compiled and publicized the "Road Map to Promote Regional IoT Implementation" and the "Primary Proposal for Achievement of Roadmap" in December 2016 and the revised the Roadmap and the Secondary Proposal in May 2017.

(D) Project to Train Personnel Specialized in IoT Network Operation

Networks in the IoT/big data era are expected to involve rapid traffic fluctuations due to significantly increased connection of sensors and other equipment and diversification of circulating data. Therefore, networks need to be properly controlled through circumvention or capacity expansion of communication routes using SDN/NFV or other software technologies. Personnel specialized in operation and management of networks using these technologies are required. MIC has been conducting the "Project to Train Personnel Specialized in IoT Network Operation" since FY2017 and has developed and operated environmental infrastructure for training such personnel, while clarifying required skills and means for certification thereof.

B. Development of Environment for Open Data Distribution

Since FY2012, MIC has carried out demonstration tests for open data utilization in various sectors, including public transportation systems, GIS, and public facilities, has established a common AIP for cooperation in information distribution, and has prepared and revised guidelines for the disclosure and utilization of open data (standardization for open data). In FY2016, MIC conducted a demonstration test targeting people planning to visit Japan for providing detailed tourist information and assisting their personal planning of Japan tours by the use of open data disclosed by respective local governments.

C. Promotion of AI Networking

Artificial intelligence (AI) is expected to spread broadly beyond space if connected to other AI and information systems via the internet, etc. and incorporated in a network (AI networking), with its benefits and risks both increasing drastically. In October 2016, MIC set up the "Conference toward AI Network Society" and has worked to prepare draft guidelines for AI development as a basis for international discussions. The Conference is also deliberating assessment of impacts (mainly positive impacts and benefits) and risks of AI networking on the society and economy, envisaging concrete AI utilization in diverse fields.

Section 2 Developments in Telecommunications Policy

1. Promotion of Fair Competition

(1) Promotion of Mobile Services

Mobile services for smartphones, etc. have played a significant role as an indispensable lifeline for people's everyday life, and it is necessary to ensure reasonable charges and services that are easy to understand for users to further disseminate them. For further reducing charges for smartphones, MIC amended the Regulations on Charges for Accessing Category II Designated Telecommunications Facilities (in February 2017) to ensure appropriate interconnection charges to be paid by MVNOs to major mobile carriers, and established the Guidelines on Mobile Service Conditions and Terminals (in January 2017) with the aim of shortening the period required for unlocking SIM codes and improving sales practices of smartphones.

(2) Development of Ultra-high-speed Broadband Infrastructure

The development of ultra-high-speed broadband infrastructure is important and essential to revitalizing Japan's regional communities. To promote infrastructure development, MIC launched the "ICT Infrastructure Development Promotion Project" in FY2016. The program will help to cover a portion of the costs when local governments in disadvantaged regions, such as underpopulated regions or remote islands, undertake the construction of optical fiber or other forms of ultra-high-speed broadband infrastructure.

(3) Assurance of Adequateness, Fairness, and Transparency in the Provision of NTT East and West FTTH Access Services, etc.

MIC reviewed the "Guideline on the Application of the Telecommunications Business Act Pertaining to NTT East and West FTTH Access Services and Other Wholesale Telecommunications Services" with respect to acts performed by carriers that provide wholesale services, carriers that receive wholesale services, and contracted agents that receive wholesale services. The review was based on rules to protect consumers providing for the accountability prior to concluding contracts and the obligation to deliver documents, etc., which were strengthened or newly introduced by the Act Partially Amending the Telecommunications Business Act enforced in May 2016. In July 2016, MIC started to receive notifications on the provision of wholesale telecommunications services from NTT East and West under the provisions of Article 38-2 of the Telecommunications Business Act, and compiled and publicized the information prepared on or obtained through those notifications under the provisions of Article 39-2 of the same Act.

(4) Ideal Smooth Transition of the Fixed-line Telephone Network

The public switched telephone network (PSTN) of NTT East and West is the core communications infrastructure, which mediates communications between carriers, including those for IP phone and mobile phone services, and serves as the basis of competition for those carriers. Therefore, the future form of IP network

and ideal transition from the fixed-line telephone network will exert significant influence on users and carriers.

In order to deliberate this issue under such understanding, MIC consulted with the Information and Communications Council regarding the ideal smooth transition of the fixed-line telephone network in February 2016, and the first report "Ideal IP Network after the Transition" was compiled in March 2017.

(5) Market Verifications in the Telecommunications Business Field

Under the framework of the Telecommunications Business Act, which basically focuses on after-the-fact regulations, it is required to promote fair competition and ensure user convenience in the telecommunications business field, which has been facing rapid changes such as a structural change in the telecommunication market due to fast advancement of ICT and emergence of new business models. For that purpose, it has become important to accurately ascertain and properly analyze and verify market trends and reflect the results thereof in carrying out policies.

In view of these necessities, MIC has enhanced and expanded the assessment of competitions in the telecommunications business field and the fair competition review system for facilitating the dissemination of broadband communications. MIC has also been carrying out market verifications since FY2016 to integrally conduct analyses and verifications of market trends and confirmations of the correctness of carriers' business practices.

(6) Mediation and Arbitration by the Telecommunications Dispute Settlement Commission

A. Overview of the Telecommunications Dispute Settlement Commission

The Telecommunications Dispute Settlement Commission is a specialized organization established for the purpose of quickly and fairly handling increasingly diverse conflicts in the telecom field. The Commission has three functions: (i) performing mediation and arbitration to resolve conflicts between carriers and other businesses; (ii) deliberating and releasing reports in response to consultations from the Minister for Internal Affairs and Communications, who intends to issue an order or ruling; and (3) giving recommendations to the Minister for Internal Affairs and Communications regarding improvements to competition rules or other matters as part of its mediation, arbitration, and consultation responses.

B. Negotiation Orders and Rulings by the Minister for Internal Affairs and Communications

In the telecom field, when negotiations between telecom businesses fall apart on matters such as interconnection or shared use of telecommunications equipment, shared use of structures for telecommunications equipment and installations, or the provision of wholesale telecommunications services, a telecom business may apply to the Minister for Internal Affairs and Communications to issue an order to start or resume negotiations or to make a ruling on the matter based on the provisions of the Telecommunications Business Act.

2. Ensuring Safety and Reliability of Telecommunications Infrastructure

MIC enacted the ICT Network Safety and Reliability Standards to ensure stable provision of communications and to prevent misuse of communications. The standards provide basic, but comprehensive, indicators spanning all security and reliability aspects of ICT networks, such as necessary hardware and software functionality and system maintenance and operation methods.

3. Proper Handling of Personal and User Information in Telecommunications Services

Smartphones store many forms of user information, and apps collect and use such information. In some cases, apps provide collected information to third parties, but users have concerns and anxieties because of the difficulty in finding out what information is being collected and used. MIC investigated issues surrounding the widespread use of privacy policies and the promotion of a system for third parties to verify operational and technology aspects of apps. From FY2014 to FY2015, MIC carried out tests prior to constructing a third-party verification system.

Section 3 Developments in Radio Policy

1. Promoting Effective Radio Spectrum Use

(1) Studies on How to Encourage Effective Radio Spectrum Use

In January 2016, MIC set up the Radio Policy 2020 Panel for the purpose of investigating approaches to the radio usage fee system, which is due to be revised in FY2017, and deliberating policies to advance Japan's wireless services and boost their international competitiveness leading up to 2020, as well as directions for system revisions that will allow for the introduction of new wireless systems. The Panel compiled a report in July 2016.

(2) Policies for Effective Radio Spectrum Use

The Radio Policy 2020 Panel pointed out key issues regarding institutional review of supervision of radio spectrum use, such as means for resolving problems in the current systems for introducing new wireless systems and ideal regulations on supervision of radio spectrum use. Based on collected opinions and the results of hearings, the Panel showed concrete directions for institutional review.

MIC submitted the Bill Partially Amending the Radio Act and the Telecommunications Business Act to the Diet in February 2017 and the Bill was enacted in April 2017. This amendment aims to allow required review of the radio usage fee system and the system concerning supervision of radio spectrum use.

2. Radio Usage Advancement and Diversification Initiatives

(1) Promoting Intelligent Transport Systems

To realize the safe and convenient movement of people and goods, MIC is pursuing initiatives to reduce traffic accidents and resolve traffic congestion with Intelligent Transport Systems (ITS). Connected cars equipped with internet access are expected to be further developed and disseminated, and possible security risks due to their links to networks are cited as a new problem in a connected car society, where everybody can freely enjoy safe and convenient mobility services. MIC has held the Study Group Focusing on Realization of Connected Car Society since December 2016 to seek a new social image brought about by connected cars and measures to promote related initiatives.

(2) Advancements in Disaster-management Radio

Disaster administration wireless communications (Simultaneous Broadcast) are an important means of conveying information from disaster-management administration to evacuation sites, disaster-management bases, and homes. Digital formats that enable interactive communications and data communications are being introduced for these wireless systems to make it possible to address diverse information provision needs, such as collecting disaster information via images, exchanging information with evacuation sites, and notifying information from disaster-management administration via text displays. Digital formats are also being introduced for a mobile disaster prevention unit, in addition to the previous analog format, that will make it possible to communicate data and images as well as voice.

3. Establishing Radio Usage Environments

(1) Promoting Measures to Counter Bioelectromagnetic Environmental Issues

MIC promotes initiatives to establish environments where radio waves can be used safely and securely. With regard to the impact of radio waves on humans, MIC has set up radio protection guidelines and safety standards on the strength of radio waves in the Radio Regulations. MIC has ensured these standards are equivalent to international guidelines and incorporated therein the results of many years of studies on the safety of radio waves. As troubles over wireless applications are increasing in accordance with the expansion of radio use in medical institutions, the Task Force for Promoting Radio Use in Medial Institutions was set up under the Electromagnetic Compatibility Conference Japan to discuss how to secure proper radio usage environment in medical institutions. Based on discussions at this Task Force, the Guidelines for Safe Radio Use in Medial Institutions and the report were publicized in April 2016.

(2) Promoting Measures to Counter Electromagnetic Interference

With the growth in all kinds of electrical and electronic devices, it is increasingly important to take measures to protect wireless applications from unnecessary radio waves emitted by these electrical and electronic devices. The Radio Wave Utilization Environment Committee, established under the Information and Communications Technology Subcommittee at the Information and Communications Council, surveys and studies measures to counter electromagnetic interference and contributes to debates on international standards at CISPR (Comité International Spécial des Perturbations Radioélectriques). Receiving a report from the Information and Communications Council, MIC has promoted related standardization in Japan and made efforts to eliminate and prevent interference by unnecessary radio waves to wireless facilities and electrical and electronic devices.

(3) Preventing Radio Interference and Obstruction

MIC has been implementing radio equipment trial purchase tests since FY2013 with the aim of preventing ordinary consumers from violating the Radio Act (illegally establishing a radio station) by purchasing and using radio equipment that is not compliant with technical standards and preventing the equipment from interfering or otherwise obstructing other radio stations. For the tests, MIC purchases radio equipment from the market sold as equipment emitting very low power radio waves, and measures the actual strength of emissions to see whether they are in conformity with the technical standards stipulated in the Radio Act. MIC publishes the test findings as consumer protection information.

Section 4 Developments in Broadcasting Policy

1. Encouraging Distribution of Broadcast Content

(1) Encouraging Overseas Expansion of Broadcast Content

With a broad range of participating stakeholders, including broadcasters, rights organizations, trading companies, and ad agencies, the Broadcast Program Export Association of Japan (BEAJ) was established in August 2013 as a joint public-private cross-industry organization that supports the overseas expansion of Japanese broadcast content. MIC works closely with BEAJ and relevant ministries and agencies to continuously support initiatives wherein Japanese and foreign broadcasters jointly produce broadcast content to communicate the appeals of Japan and secure broadcast time and broadcast such content in foreign countries.

(2) Proper Production and Trade of Broadcast Content

MIC established the Guidelines on Proper Production and Trade of Broadcast Content in 2009 in the interest of improving the production environment in the broadcast content field and adding incentives to produce broadcast content. The Guidelines aims to correct production transactions between broadcasters and program production houses. As part of this effort, MIC conducts regular follow-up studies on the Guidelines to ascertain the current status of broadcast content production transactions. MIC publicizes the results of the studies and holds lecture meetings to explain the details of the Guidelines, thereby striving to disseminate and increase use of the Guidelines.

2. Advancements in Broadcast Services

For disseminating next-generation smart TVs, which enable new broadcast and communications-linked services, MIC conducted demonstration tests in 2016 with regard to the provision of advanced services customized for each viewer (information distribution and advertisements, etc.) through comprehensively analyzing viewing history and other various data (purchase history, etc.) Based on the results of these demonstration tests, the IPTV Forum establishes and implements hybridcast technical specifications.

3. Strengthening the Disaster Resilience of Broadcast Networks

To support the efforts of broadcasters and local public organizations aiming to strengthen the disaster resilience of broadcast networks, MIC, in the FY2017 budget, is implementing the "Assistance Program for Broadcast Network Establishment" using the general account budget and the "Assistance Program to Eliminate Poor Reception Areas for Commercial Radio" using funds from radio spectrum use fees.

4. Ensuring the Safety and Reliability of Broadcast Infrastructure

MIC has developed rules concerning technical standards on broadcasting equipment, reporting major incidents with broadcasting equipment, and other matters in keeping with the amended Broadcast Act enforced in June 2011. The rules were established for preventing broadcast outages and ensuring the safety and reliability of broadcast infrastructure, so that broadcasting fulfills its public mandate. Based on these rules, MIC is now taking proactive measures, such as obliging broadcasters to maintain broadcasting equipment correctly and requiring them to thoroughly investigate the causes of any serious accidents and take effective steps to prevent reoccurrence.

5. Various Issues concerning Broadcasting Policy

MIC set up the Study Group on Broadcasting Issues in November 2015 with the aim of investigating various issues concerning broadcasting, such as (i) future possibilities for the broadcasting market and services; (ii) initiatives to ensure and broaden the interests of viewers; (iii) approaches to securing regional media and regional information in broadcasting; and (iv) measures to be taken for issues surrounding public broadcasting. The Study Group compiled the first report in September 2016. Based on this report, MIC consulted with the Information and Communications Council regarding the measures for promoting production and distribution of broadcast content in response to changes in the viewing environment in October 2016.

Section 5 Promoting ICT Use and Application

1. Promoting ICT Application in the Education, Medicine and Other Fields

(1) Promoting ICT Use and Application in the Education Field

MIC carried out the "Leading Education System Demonstration Project," together with the Ministry of Education, Culture, Sports, Science and Technology, (MEXT) from FY2014 to FY2016 in order to promote ICT use and application in the education field. In the project, MIC and MEXT demonstrated the Education Cloud Platform, which will enable students and teachers to use various kinds of digital materials and tools anywhere and at any time and can be introduced and operated at low cost.

(2) Promoting ICT Use and Application in the Medical, Nursing, and Health Fields

A. Promoting Use of Personal Health Records (PHRs)

MIC has been carrying out the "Study Project for Promoting Use of Personal Health Records (PHRs)" as a research project led by the Japan Agency for Medical Research and Development (AMED) for three years starting from FY2016. The studies aim to develop PHR service models in accordance with four life stages: (i) support for pregnancy, delivery and child-rearing, (ii) prevention of illness and nursing care, (iii) prevention of serious lifestyle-related diseases, and (iv) collaboration in the medical and nursing care services, and to establish fundamental technologies to enable comprehensive use of various PHRs.

B. Promoting Nationwide Dissemination of Electronic Health Record (EHR) Infrastructure

MIC is carrying out the "Cloud-based EHR Sophistication Project" to achieve effective community-based integrated care and facilitate wide-area data cooperation across communities. Specifically, the project assists sophistication of EHRs, such as enabling interactive information exchange by linking diverse facilities in respective communities, including hospitals, clinics, dentists, pharmacies, and nursing care facilities, via a network by the use of cloud-based technologies.

C. Promoting Application of 8K Technology to the Medical Field

At present, MIC is promoting 4K/8K broadcast services as part of its initiatives for sophisticating broadcast services. 4K is four times and 8K is 16 times the current high definition in terms of pixels and 4K/8K broadcasting provides viewers with vivid and alive ultra-high-definition images. As the application of 8K technology is expected to bring about innovation in medical services in diverse fields, MIC launched the Study Group on Applying 8K Technology for Intelligent Medicine, which concretely discussed the potential of and problems in promoting medical applications of 8K technology and compiled a report in July 2016. Based on this report, demonstration tests are being carried out for the implementation of a data sharing base necessary for collecting, transmitting and storing large amounts of ultra-high-definition image data, the development of an AI-aided diagnosis system, the development of an 8K endoscope (hard mirror), and telemedicine and telepathology, etc.

(3) Promoting Teleworking

Teleworking enables, through the use of ICT, flexible working arrangements that make better use of time and location. Teleworking is expected to improve the work-life balance of workers and also raise the productivity of enterprises. MIC is promoting "Furusato (Hometown) Teleworking," which will enable people in local areas to work under the same working environment as that in urban areas, with the hope of facilitating moves of people and work to local areas. In FY2016, as the Furusato Teleworking Project, MIC subsidized programs at 22 locations nationwide to help achieve flexible working styles, improve the work-life balance, and revitalize local economies. In March 2017, MIC held a Furusato Teleworking Seminar to raise awareness of this project.

2. Regional Development Using Information and Communications Infrastructure

(1) Promoting the Development of Free Wi-Fi Environment

In December 2016, MIC formulated the "Wi-Fi Environment Development Plan Contributing to Disaster Prevention," which compiles the required number of locations and time for developing the Wi-Fi environment, with the aim of promoting the development based on this Plan and securing required information transmission means in the event of a disaster. In order to support the efforts by local governments and other third-sector entities for achieving goals specified in this Plan, MIC launched the "Free Wi-Fi Environment Development Support Project" in FY2017 and has promoted the development of a free Wi-Fi environment that will contribute to collecting and transmitting disaster information to local residents and people visiting the relevant areas upon a disaster.

For developing an environment to allow tourists to more smoothly use Wi-Fi services, MIC conducted a demonstration test for realizing authentication cooperation in line with the policies for the promotion of simplification and unification of procedures for starting the use of services, which MIC formulated in February 2016. Based on the results of the demonstration test, the Wireless LAN Certification Organization was estab-

lished in September 2016 and new services adopting the certification method commercialized by this Organization were commenced in October 2016.

(2) Promoting the Widespread Adoption of ICT Best Practices that Help Resolve Regional Issues

Respective regions are making efforts to resolve various issues Japan faces (such as a declining population, a falling birthrate and aging population, shortages of health practitioners, need to enhance disaster preparedness, and decaying regional economies). MIC broadly invites applications nationwide and awards prizes to leading examples of ICT use and application that contribute to revitalizing local economies. MIC places importance on ICT use that contributes to resolving regional issues and revitalizing communities and commenced the ICT Use Award Conducive to Local Revitalization in FY2016, in lieu of the Local Computerization Award that had been granted since FY2014.

(3) Establishing Support Systems through the Deployment of ICT Experts Directed at Regional Stimulation

MIC has been conducting initiatives to build up local economies and communities by making use of ICT since FY2007. Activities include sending Regional ICT Advisors — experts with knowledge and insight into regional ICT development — to regions motivated to revive their communities through ICT, providing assistance to build success models and propagating the results of these efforts nationwide. MIC dispatched Regional ICT Advisors 268 times in FY2016.

(4) Contribution to Building Recovery Communities through ICT Infrastructure Establishment and the Restoration of ICT Infrastructure

Of the areas struck by the Great East Japan Earthquake, the tsunami washed away or severely damaged local infrastructure in many localities. The construction of recovery communities, including relocating communities to higher ground, is going ahead based on recovery plans by local governments in affected areas, in tandem with other recovery efforts. The local governments in affected areas need to establish ICT infrastructure, including ultra-high-speed broadband, environments for receiving broadcasts, and communications infrastructure and systems for public facilities, in order to help citizens smoothly start new lives and facilitate recovery using ICT infrastructure. MIC implemented the "ICT Infrastructure Establishment Project for Building Recovery Communities" also in FY2017 to assist local governments that are establishing ICT infrastructure together with new community building toward recovery.

3. Promoting Cybersecurity Policy

(1) Examinations of Execution Plans for Cybersecurity Measures

The Cybersecurity Strategic Headquarters, which was established under the Cabinet in January 2015 based on the Basic Act on Cybersecurity, formulated the Fourth Basic Policy of Critical Information Infrastructure Protection in April 2017. This Basic Policy is based on the concept of mission assurance to ensure safe and continuous provision of Critical Information Infrastructure (CII) services. Additionally in the same month, the Headquarters formulated the Cybersecurity Experts Development Program with the aim of developing an environment for creating cyberspace as the basis for safe economic and social activities.

Ahead of the 2020 Tokyo Olympic and Paralympic Games, MIC released the IoT Cybersecurity Action Program 2017 in January 2017 for ensuring cybersecurity suited to the IoT/AI era.

(2) Strengthening Cyber Security Policy

In FY2013, MIC started to conduct CYDER (CYber Defense Exercise with Recurrence), a hands-on cyber defense exercise that uses a large computer environment to simulate networks in an organization with thousands of employees. CYDER's purpose is to improve the cyber attack response skills of LAN administrators at government administration offices and key infrastructure enterprises. To address the current situation where users have problems detecting and eliminating malware infections on their own, MIC, in partnership with internet service providers (ISPs) and security vendors, has been involved with ACTIVE (Advanced Cyber Threats response InitiatiVE) since FY2013. ACTIVE is a joint public-private project that prevents and eradicates internet users' malware infections.

With respect to IoT, the IoT Security Working Group at the IoT Acceleration Consortium, in partnership with the Ministry of Economy, Trade and Industry (METI), started formulating security guidelines for the design, manufacturing, and network connection of IoT devices in January 2016 and released the formulated guidelines in July 2016.

At the same time, since cooperation with other countries is essential to establish meaningful cybersecurity, MIC has been actively participating in discussions at international conferences and cyber dialogues and has been collecting and transmitting information with the aim of contributing to forming an international consensus on cybersecurity.

4. Establishing Barrier-free Information Environments

IC runs a subsidy program to promote the development and provision of communications and broadcasting services for people with challenges, with the goal of eliminating the digital divide due to disabilities and aging. Under the program, MIC assists with necessary funds for enterprises or other organizations developing or providing communications and broadcasting services to people with physical disabilities (such as phone-relay

services for hearing-impaired people).

To promote the greater use of broadcasts for people with vision and hearing impairments, MIC established the Guidelines for Government Administration to Promote Broadcasts for the Vision and Hearing Challenged. The Guidelines set targets for the percentage of closed captioned broadcasts and broadcasts with audio commentary so that people with vision and hearing impairments can readily obtain information via broadcasts. MIC also encourages voluntary efforts by private TV broadcasters and assists with the production fees for closed captioned programming and programming with audio commentary.

Furthermore, to promote universal usage conditions, MIC issued the Guidelines on the Operation of Public Websites (2016 issue) and miChecker Ver.2.0 (Accessibility Assessment Tool) in April 2016 to make it easier for everyone, including aged people and people with physical and mental challenges, to use the websites of public institutions.

5. Developing ICT Personnel

(1) Promoting Programming Education

In FY2016, MIC started the Program to Promote Youth Programming Education to train local people as mentors and conduct demonstration tests nationwide wherein programming education is provided after school or on holidays by sharing and utilizing teaching materials and know-how on cloud platforms.

In March 2017, MIC, MEXT and METI, together with companies and ventures in the education and IT-related fields, set up the Learning Consortium for the Future to commence efforts for disseminating programming education.

(2) Raising ICT Literacy

MIC takes actions for the safe and secure use of the internet by children in partnership with MEXT and communications organizations, and runs e-Net Caravans, a series of rotating lectures given across the country to guardians, teachers, and juvenile students. Additionally, it develops and disseminates teaching materials and other resources tailored to the characteristics of different media formats to encourage the sound use of media by children.

MIC developed the Internet Literacy Assessment Indicator for Students (ILAS) in FY2011 as a test to accurately ascertain the internet literacy levels among young people. MIC has been using the test on first-year high school students across Japan since FY2012. In FY2016, increasing the participants to approx. 14,800 students from 89 schools, MIC conducted a questionnaire on the use of smartphones and ICT devices together with a test measuring the internet literacy levels of young people. The results of the questionnaire were tabulated and analyzed and were released in March 2017 as the "FY2016 Youth Internet Literacy Indicators."

6. Developing Cloud Services

(1) ASP・SaaS・IoT Cloud Consortium

To promote the expansion of ASP, SaaS, and the cloud, MIC is examining issues of concern when providing and using ASP, SaaS, and cloud services for the social capital field and other fields at the ASP-SaaS-Cloud Spread Promotion Council, which was established jointly with the ASP-SaaS-IoT Cloud Consortium (ASPIC) (formerly, the ASP-SaaS-Cloud Consortium (ASP)).

(2) Promoting Regional ICT Investment Making Use of the Cloud and Other Technologies

MIC launched the Study Group on Promoting Regional ICT Investment Using the Cloud in January 2015 to examine specific measures to further advance ICT investments that help revitalize local regions. The Study Group put together a report in July 2015. The report recommended the establishment of a promotion framework that seeks to revitalize local regions and increase productivity and profitability by switching businesses over to cloud services. In December 2015, eight private enterprises that concur with this recommendation set up the Organization for Cloud Utilization and ICT Investment by Local Enterprises.

7. Boosting Productivity with ICT

(1) Support Measures to Back up Small and Medium sized Enterprises' Aggressive Investment

Under the Act on Strengthening Management Capabilities of Small and Medium sized Enterprises (SMEs), SMEs that have established a management capability enhancement plan and obtained approval of the competent Minister of their respective business sector are eligible for preferential measures concerning fixed property tax and corporation tax, etc. for certain facilities obtained based on the approved plan. Additionally, low-interest loans from government financial institutions, credit guarantee or debt guarantee for loans from private financial institutions, or other support measures are also available for such SMEs.

(2) Assistance through the Small Business Innovation Research (SBIR) Program

The Small Business Innovation Research (SBIR) program aims to promote new business activities by SMEs. The program attempts to broaden the opportunities for SMEs to participate in national R&D projects and helps SMEs commercialize the resulting R&D outcomes from

these projects. Seven ministries, including MIC, have earmarked specific subsidies for the program.

8. Promoting e-Government

(1) Promoting the Widespread Adoption of Regional Information Platforms

Regional information platforms are the set of operational and technical rules (standard specifications) that make it possible to interconnect various information systems (for the exchange of digital information, etc.) owned by local governments. The Association for Promotion of Public Local Information and Communication (APPLIC) publishes and operates the Regional Information Platform Standard Specifications that cover 26 types of internal local government systems.

(2) Promoting the Local Government Cloud and Security Measures

The Local Government Cloud is an initiative that enables local governments to make use of system hardware, software, and data, via networks, that are managed and operated at an external data center. This also enables consolidation and sharing of information systems from multiple local governments among them. The Local Government Cloud saves local governments from having to manage and operate system hardware, software, and data at their own offices. MIC is conducting research for accelerating this move and is promoting the consolidation of local governments' operation systems into this cloud.

MIC announced the Ten Guidelines to Accelerate e-Local Government Initiatives in March 2014 for the purpose of further promoting e-government initiatives by local governments, such as the adoption of the Local Government Cloud. In November 2014, MIC launched the Follow-up Study Group on the Ten Guidelines to Accelerate e-Local Government Initiatives, consisting of experts in the field and officials from local governments.

(3) Enhancing Infrastructure to Achieve Citizen-centered e-Government and More Efficient Administrative Procedures

A. Application of the Basic Resident Registration Network System

The Basic Resident Registration Network System (*Juki-Net*) is a local government system that networks basic resident registries. The system enables the provision of personal identification records (name, address, date of birth, gender, Individual Number, resident register code, and updated information of these records) to government institutions and the administrative processing of basic resident registers between municipal boundaries. The Basic Resident Registration Network System has operated stably for over 14 years since it went into operation in August 2002, and it has assumed a pivotal role in improving convenience for residents and as infrastructure for e-government and e-local government and as the basis for the Individual Number System since October 2015.

Municipalities have issued individual number cards since January 2016, and citizens can now obtain various forms of ID and certificates at convenience stores using their individual number cards. This service of allowing citizens to obtain certificates at convenience stores was available in 402 municipalities as of April 3, 2017.

B. Public Certification Service for Individuals Provided by the Japan Agency for Local Authority Information Systems

Based on the Act on Certification Affairs of the Japan Agency for Local Authority Information Systems pertaining to Electronic Signatures, the Japan Agency for Local Authority Information System provides e-certificates for signature and e-certificates for identity verification. Applicants go through strict identity verification at designated municipal counters and may receive the issuance of a certificate stored in their individual number cards. For example, a person can affix an e-signature using his/her e-certificate for signature with a secret key stored in his/her individual number card and send it with the e-certificate for signature, thereby being able to make an online application with an administrative agency.

Section 6 Promoting ICT Research and Development

1. Promoting Research and Development Strategies

The interim report by the Information and Communications Council in July 2015 recommends priority R&D fields and topics, as well as a policy on promoting them, that the central government and NICT, etc. should pursue. Based on this interim report, MIC is making efforts to promote the development, demonstration, and standardization of IoT technologies at the Smart IoT Acceleration Forum (Technology Development Working Group) established under the IoT Acceleration Consortium as an industry-government-academia IoT promotion framework. The second interim report publicized in July 2016 compiles the Smart IoT Acceleration Strategy and the Next Generation AI Promotion Strategy for strengthening and maintaining the international competitiveness of the Japanese economy and ensuring sustainable growth in the IoT, big data, and AI era. Additionally, the Measures to Train IoT Experts to enable younger generations to have power equal to that of foreign competitors, and the new Standardization Strategy to specify priority areas in future international standard-

ization activities and concrete goals for each area are also formulated in the report.

2. Enhancing Research and Development to Realize Cutting-edge ICT in All Parts of Society

(1) Establishment and Demonstration of Common IoT Platform Technologies

MIC decided to conduct research and development, starting in FY2016, on common platform technologies, such as technologies to quickly and efficiently connect massive numbers of IoT devices and technologies to consolidate IoT devices and services with different wireless standards and to connect and accommodate them in networks efficiently and securely. In collaboration with the aforementioned Smart IoT Acceleration Forum, MIC has been strengthening efforts for international standardization.

(2) Promoting Research and Development into Next-generation Optical Network Technologies

NICT is researching and developing the base technologies to make possible fast, high-capacity, low-power networks (all-optical networks) with all signal transmissions and conversions done optically. For its part, MIC is engaged in research and development laying the groundwork for products and markets that have early commercialization potential from among those basic technologies obtained through NICT research and development.

(3) Promoting Research and Development and Pilot Programs of Multilingual Voice-based Translation Technology

Under a five-year plan that began in FY2015, MIC is working to implement multilingual voice-based translation systems. This project necessitates other initiatives, such as research and development into noise-reduction technologies so that conversations can be recognized correctly in noisy environments. The performance of such technologies must be evaluated in real-world settings such as hospitals, commercial establishments, trains, and taxis.

(4) Promoting Research and Development of AI-related Technologies

NICT's Universal Communications Research Institute is mainly working on research and development of technologies to analyze big data and multilingual voice-based translation technologies. NICT's Center for Information and Neural Networks (CiNet) is working to elucidate brain mechanisms and conducting research and development into network control technologies that make use of these mechanisms and into technologies to measure brain functions.

(5) Construction and Application of Testbeds to Accelerate the Public Implementation of Research Findings

NICT constructed the Japan Gigabit Network (JGN), an R&D testbed network, in FY1999. The testbed has been made available to a wide range of domestic and overseas research institutes and has helped advance research and development into cutting-edge network technologies and testing of many applications. NICT started operating StarBED, a large-scale general-purpose internet simulator, in FY2002. In FY2011, NICT began providing StarBED3, a large-scale emulation platform, as a testbed for verifying many kinds of technology.

3. Assistance for Creating Innovation Using Competitive Funding

(1) Strategic Information and Communications R&D Promotion Programme (SCOPE)

MIC seeks novel R&D themes in the ICT field broadly from universities, national R&D agencies, private companies, local government research institutes, etc., selects highly potential ones through assessment by external intellectuals, and offers competitive funds to R&D activities on those selected themes. Since FY2002, MIC has offered financial support for over 600 R&D themes.

(2) ICT Innovation Creation Challenge Program

The ICT Innovation Creation Challenge Program (IChallenge!) was launched in FY2014 to stimulate made-in-Japan innovation in the ICT field. I-Challenge!, which accepts submissions anytime, encourages universities and venture businesses to commercialize technologies and assists them in taking on the challenge of new business domains. The Program pushes for unification of research and development support and venture incubation support, making use of the private sector's commercialization expertise and know-how.

(3) *Inno*-vation Program

MIC has instituted the *Inno*-vation Program, which aims to discover creative talent in the ICT field where existing value and accepted practices do not necessarily apply. The Program provides assistance to creative people who are taking on risky challenges with great potential in order to produce breakthrough global-scale value in the ICT field. Under the Program, challenges with ambitious targets, using revolutionary approaches and productive failures that clarify the path to eventual success, are highly regarded.

4. Research and Development Programs Promoting International Collaborations in the ICT Field

(1) Strategic International Joint Research in Cooperation with Foreign Governments

MIC, in partnership with the European Commission, has been providing funding for joint research proposals from universities, private corporations, and other research institutes in Japan and Europe since FY2012, based on an agreement at the Japan-Europe Ministerial Meeting in May 2012. In FY2016, joint research was conducted on four themes (big data, optical communications, 5G, and ICT robotics). The country coverage was expanded in FY2016 and joint research was newly conducted together with the United States on one theme (smart cities).

(2) Promoting International Exchanges between Researchers

NICT runs the International Exchange Program, which facilitates exchanges between researchers in different countries working in advanced communications and broadcasting fields. The Program promotes the sharing of the latest technology and research information, elevating technology levels, and developing human resources as well as contributes to furthering research and development and international cooperation.

5. Contributions to More Resilient Public Infrastructure

(1) Strengthening the Disaster Resilience of Communications and Broadcast Infrastructure

Since FY2014, MIC and NICT have engaged in R&D on the strengthening of resilient disaster prevention and mitigation functions (sharing and utilization of real-time disaster information), which is one of the research themes of the Cross-ministerial Strategic Innovation Promotion Program (SIP). MIC has endeavored to develop technologies to forecast heavy rains and tornados and technologies to deliver disaster information using the outcomes of this research and development.

(2) Maintaining Public Infrastructure Using ICT

In order to achieve effective and efficient maintenance of public infrastructure using ICT such as sensors, MIC is working on R&D and international standardization of highly reliable communications technologies to collect and transmit data on distortion, vibration, etc. measured with sensors at super-low power consumption.

(3) Study Group on Future Network Infrastructure

MIC set up the Study Group on Future Network Infrastructure in January 2017. The purpose of this Study Group is to discuss technical problems and promotion policies for creating network infrastructure that can properly meet rapidly growing needs for ICT and support a society where ICT is fully utilized, envisaging the near future from 2020 to around 2030.

6. Other Research and Development Programs

(1) Space Communications Technologies

In collaboration with MEXT and METI, MIC is developing the Unit 9 Engineering Test Satellite capable of large-capacity transmissions for conducting an in-orbit demonstration of flexible payload technology, etc. Additionally, MIC started to hold the Space×ICT Conference in November 2016 to discuss new businesses and social image that will be brought about by ICT-based innovative space use and means to achieve them.

(2) Future Base ICT Technologies

MIC and NICT are researching and developing base technologies for achieving a new ultrafast wireless communication system and sensing system. NICT is researching and developing quantum communications technology based on quantum cryptography and quantum signal processing as well as nano ICT technology and base electromagnetic sensing technology.

Section 7 Promoting International Strategies for ICT

1. Priority Promotion Themes for International Policy

(1) Promoting Overseas Deployment of Japanese ICT

MIC is organically and flexibly collaborating with the Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (JICT) and relevant organizations to proactively assist Japanese companies' overseas deployment of broadcast content, disaster prevention-related ICT, postal systems, satellites, security services, submarine optical cables, wireless systems, etc. The purpose of this initiative is to promote adoption of the Japanese ISDB-T standard for terrestrial digital TV and further dissemination of this standard and to expand cooperative relationships built up in the field of terrestrial digital broadcasting to the entirety of the ICT field.

ISDB-T has the strength in its unique functions to (i) broadcast emergency warnings to protect people's lives,

(ii) enable reception of TV broadcast with mobile terminals (One Seg service), and (iii) provide diverse services through data broadcasting. The Japanese ISDB-T standard has been adopted in 19 countries in total (as of May 2017), including El Salvador that adopted the standard in January 2017.

In addition, in collaboration with ministries and agencies in charge of disaster prevention, such as the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and Japan Meteorological Agency, MIC is promoting overseas deployment of disaster-response and other ICT systems. Policy dialogues with partner countries over projects and cooperation policies, surveys and demonstration tests for checking applicability of Japanese ICT solutions and other efforts are bearing fruit and Japanese disaster prevention ICT systems have been adopted in countries in Asia and Central and South America.

(2) Developing an Environment for ICT Overseas Deployment and Developing an Environment for Smooth Distribution of Information

MIC stresses two points in constructing international rules for cyberspace: (i) the maximum regard must be given to the freedom to distribute information, not only to sustain democracy but also because information is the engine of economic growth and the source of innovation, and (ii) the participation of the private sector, including private enterprises and civil society who actually use the internet in their activities and manage networks (a multi-stakeholder framework), is essential to ensure adequate cybersecurity. From this perspective, MIC actively participates in debates at bilateral and multilateral meetings.

2. Initiatives in International Frameworks

(1) G7

In April 2016, the G7 ICT Ministers' Meeting in Takamatsu, Kagawa was held as part of the ministerial meetings of the Ise-Shima Summit held in May 2016. As the chair of the meeting, MIC compiled the progress of initiatives of the respective countries and the Japanese government's proposals for further promoting those initiatives as the follow-up to the Meeting. The Follow up Report of the Charter and the Joint Declaration from the 2016 G7 ICT Ministers' Meeting was released in March 2017.

(2) Asia-Pacific Economic Cooperation (APEC)

APEC's Telecommunications and Information Working Group (TEL) approved the TEL Strategic Action Plan 2016-2020 at TELMIN 10 held in Kuala Lumpur, Malaysia, in March 2015. Based on this Action Plan, discussions have been held on the promotion of innovation through ICT use, enhancement of broadband access, expansion of IoT, and facilitation of free information distribution, etc. MIC hosted TEL 54 in Kyoto Prefecture (at Kansai Science City, also known as Keihanna Science City) between October and November 2016 and held a round-table discussion on free information distribution, a round-table discussion on Silver ICT, and a workshop on 4K/8K broadcast services. In this manner, MIC has made positive contribution to the operation of TEL meetings.

(3) Asia-Pacific Telecommunity (APT)

The APT coordinates regional policies on human resources development, standardization, and wireless communications through training courses and seminars in order to develop information and telecommunications infrastructure in the Asia-Pacific region in a balanced manner. MIC has accepted trainees in the ICT fields that are Japan's forte and assisted exchanges between ICT engineers and researchers, using Japan's extra budgetary contributions to the API.

(4) Association of Southeast Asian Nations (ASEAN)

Japan, as a dialogue partner country of ASEAN, exchanges opinions and proposals to strengthen Japan-ASEAN cooperation, making use of opportunities for dialogue at the Japan-ASEAN Telecommunications and IT Ministers Meeting and the Conference of ASEAN Ministers responsible for Information (AMRI). Regarding proposals on workshops etc. agreed to by both parties, Japan makes use of the Japan-ASEAN ICT Fund, established with contributions from Japan, to carry them out.

(5) International Telecommunication Union (ITU)

The ITU carries out many activities including allocating frequencies, standardizing telecommunications technology, and aiding development in the telecommunications field in developing countries. Japan is an active contributor to ITU, obtaining chair and vice-chair positions in study groups in many different fields, taking leadership posts for various research topics, and making recommendations and proposals.

(6) World Trade Organization's Doha Round of Negotiations

The telecommunications field is one of the most important trade-in-services fields at the Doha Round of negotiations at the World Trade Organization (WTO). Active negotiations are ongoing on further deregulation in the telecommunications field. Japan's telecommunications sector is one of the most deregulated in the WTO. As such, Japan is pushing other countries to eliminate or relax foreign capital regulations and other restrictions in the telecommunications sector.

(7) Organisation for Economic Co-operation and Development (OECD)

The OECD carries out studies and examinations of government policy issues related to information and communications and their impact on economies and society through the exchange of opinions among member countries (35 countries) at the Committee on Digital

Economy Policy (CDEP).

Section 8 Developments in Postal Service Administration

1. Promoting Postal Service Administration

In October 2013, MIC consulted with the Information and Communications Council regarding the securing of universality of postal services and ideal measures to revitalize mail and correspondence delivery services, and received a response in September 2015. The report presents ideal service levels and postage rates and sharing of cost for politically inexpensive services as mid- to-long term measures. Since July 2016, MIC had held the Study Group on Problems Concerning Universal Postal Services and compiled and released the Compilation of Discussions, which outlines the current status and problems concerning types of postal services, politically inexpensive services, and maintenance and utilization of post office networks.

2. Promoting Postal Service Administration in the International Field

As emerging and developing countries tackle modernizing and advancing their postal operations, MIC is working to deploy Japanese-style postal infrastructure systems to these countries and has provided them with Japan's superb knowledge and technology in the area of postal operations. In this initiative, MIC aims to not only offer technical guidance or other cooperation but also encourage Japanese companies with relevant knowledge to smoothly enter into these business fields by making proposals on various business services utilizing post offices and other postal services.

3. Promoting the correspondence delivery business

Correspondence delivery falls into two categories: general correspondence delivery businesses, which provide general correspondence services nationwide, and specified correspondence delivery businesses, which offer limited correspondence delivery services that do not undermine the provision of universal postal mail services. As of March 31, 2017, 495 operators had entered the specified correspondence delivery business.