

Main Contents

2025 White Paper on Information and Communications in Japan

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Part 1

Special Feature

Digital Technologies as Spreading "Social Infrastructure"

Chapter 1

Penetration, Expansion, and Trends of Digital Technologies as “Social Infrastructure”

The year 2025, a quarter into the 21st century, will mark the 100th anniversary of the start of radio broadcasting in Japan (1925) and the 40th anniversary of the liberalization of telecommunications (1985), which saw the privatization of Nippon Telegraph and Telephone Public Corporation and the liberalization of telecommunication business for private companies.

When considering information and communication infrastructure, the first thing that comes to mind is communication and broadcasting networks that form the basis for information distribution. However, with the spread of the Internet and the advancement of digital technologies in all aspects of our society and economy at present, the digital ecosystem is becoming increasingly essential and it continues to expand year by year as it performs social infrastructure functions. As the impact of digital technologies and services on our lives, society and economy is expected to expand significantly in the future, both positively and negatively, it is becoming more important than ever to address challenges in the digital field and to use digital technologies to solve and mitigate social issues.

In light of the current situation in which the expansion of the digital ecosystem as social infrastructure is having a major impact on our society and economy, this Special Feature in the White Paper is titled “Digital Technologies as Spreading ‘Social Infrastructure,’” and provides

an overview of the trends in the expansion of the digital ecosystem, which functions as social infrastructure, the trends in the explosive development of artificial intelligence (AI), which is likely to permeate and influence various areas of the digital ecosystem and become a fundamental element supporting the digital society, the rise of foreign business operators that are major players in such digital sector, and the situation in Japan. Based on this, against the backdrop of today's global situation and changes in the natural environment and society, the Special Feature provides an overview of today's challenges brought about by the advancement of digital technologies and their expanding impact on society and responses to such challenges, as well as the role and prospects for digital technologies in resolving and mitigating major social issues in Japan.

Chapter 1 provides an overview of the current state of the expansion of the digital ecosystem, which currently functions as social infrastructure, the progress and utilization of AI, which is expected to become a fundamental element supporting the digital society in the future, the rise of foreign business operators in the digital field, and the current situation in Japan. Taking into account the current global situation and changes in the natural environment and society, Chapter 1 will also provide an overview of the prospect for the future digital society and the role that the evolving digital technologies should play.

Section 1 Expansion of the Digital Ecosystem, which Functions as Social Infrastructure

As digital technologies permeate society and the digital ecosystem expands as an important and essential “social infrastructure” in social life and corporate activities, including social networking service platforms and cloud services, major changes are occurring in information gathering, communication, consumption behavior,

and corporate economic activities.

This section provides an overview of the changes and expansion of the digital field, which is highly important and essential in socio-economic activities, taking into account trends in the use of digital technologies in social life, corporate activities, administrative agencies, etc.

1. Permeation and Expansion of Digital Technologies in Social Life

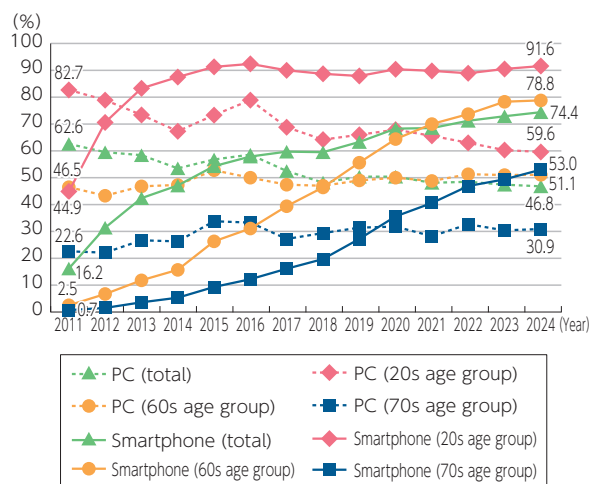
(1) Internet connection devices

In the past, personal computers were the main devices used to connect to the Internet, but with the increasing speed of mobile networks, cheaper mobile phone charges, and the diversification of applications available on smartphones, people, including the elderly, are shifting to smartphones.

For example, the rate of smartphone usage as an Internet connection device was 16.2% in 2011, but in-

creased to 74.4% in 2024, surpassing the rate of PC usage as an Internet connection device in 2017 (2017: smartphones (59.7%), PCs (52.5%)). Smartphones have become the mainstream Internet connection device, including among the elderly, with significant increase in both those in their 60s (2.5% in 2011, 78.8% in 2024) and those in their 70s (0.7% in 2011, 53.0% in 2024) (**Figure 1-1-1-1**).

Figure 1-1-1-1 Changes in the usage rate of Internet connection devices (PCs*, smartphones)



* It was "Home computer" before 2016

(Source) Prepared from the MIC "Communication Usage Trend Survey"



Figure (related data) Changes in the usage rate of Internet connection devices (smartphone) (by age group)

Source: MIC "Communication Usage Trend Survey"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/dashu.html#f00002>

(Data collection)



Figure (related data) Changes in the usage rate of Internet connection devices (personal computer) (by age)

Source: MIC "Communication Usage Trend Survey"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/dashu.html#f00003>

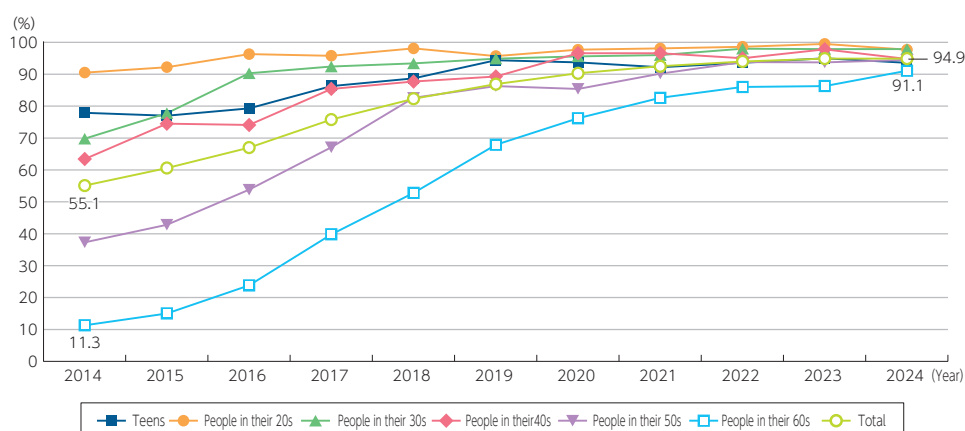
(Data collection)

(2) Communication tool/SNS

The means of communication has shifted to mobile phones, and LINE has a major presence today. For example, overall LINE usage increased from 55.1% in 2014 to 94.9% in 2024¹. Even among the elderly, the usage rate among people in their 60s increased from 11.3% in 2014 to 91.1% in 2024 (Figure 1-1-1-2).

Usage rates of other social networking services

(SNS), such as X (formerly Twitter) and Instagram, are also growing. While usage rates tend to be higher among younger generations in general, in 2024, the overall usage rate of X and Instagram was approximately 50%, and more than 40% of people in their 50s used them, indicating that usage is expanding across a wider range of age groups (Figure 1-1-1-3).

Figure 1-1-1-2 Changes in the LINE usage rate (by age group)²

(Source) Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"

¹ The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.

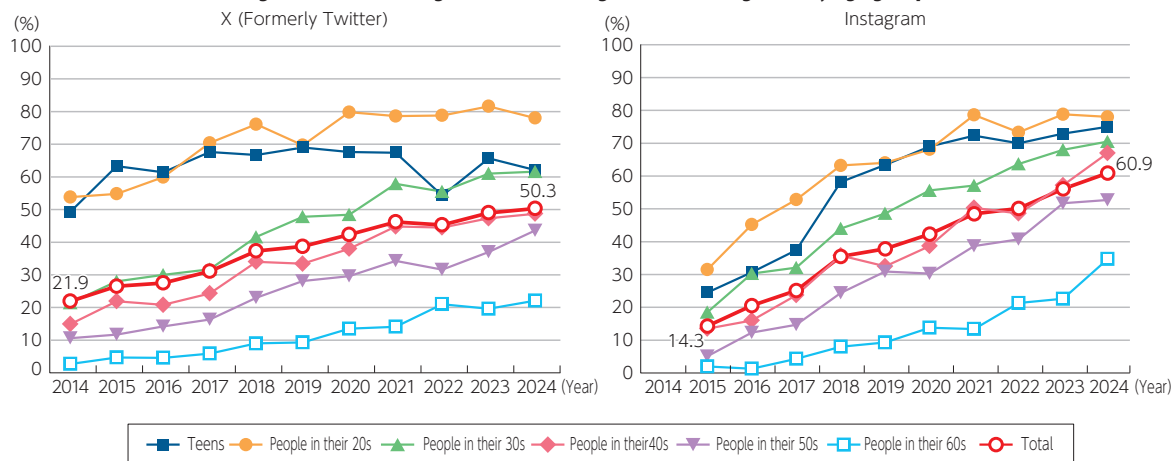
² The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.



Figure (related data) Changes in usage rates of voice call function on mobile phones and LINE

Source: Prepared from the NTT DOCOMO Mobile Society Research Institute "Mobile society white paper 2024 Edition"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00005>
(Data collection)

Figure 1-1-1-3 Changes in the SNS usage rate (X, Instagram) (by age group)³



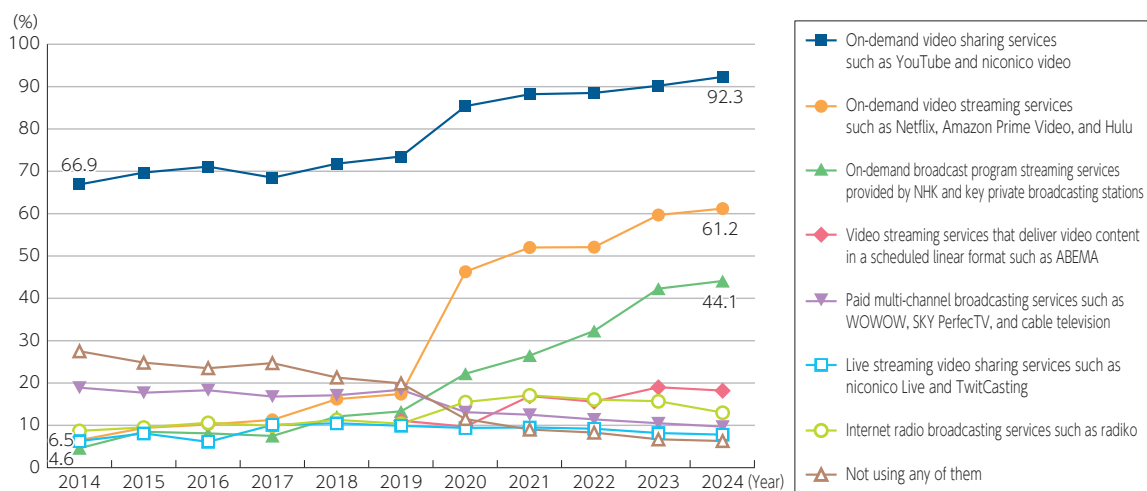
(Source) Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"

(3) Video sharing and distribution services

The number of video service users has increased significantly since 2020 as people took advantage of the time they spent at home during the COVID-19 pandemic, and usage rates still remain high. In particular, there has been an increase in the number of users of on-de-

mand video sharing services such as YouTube, on-demand video streaming services such as Netflix, and on-demand broadcast program streaming services provided by television stations (Figure 1-1-1-4).

Figure 1-1-1-4 Changes in the usage rate of video and radio services using the Internet⁴



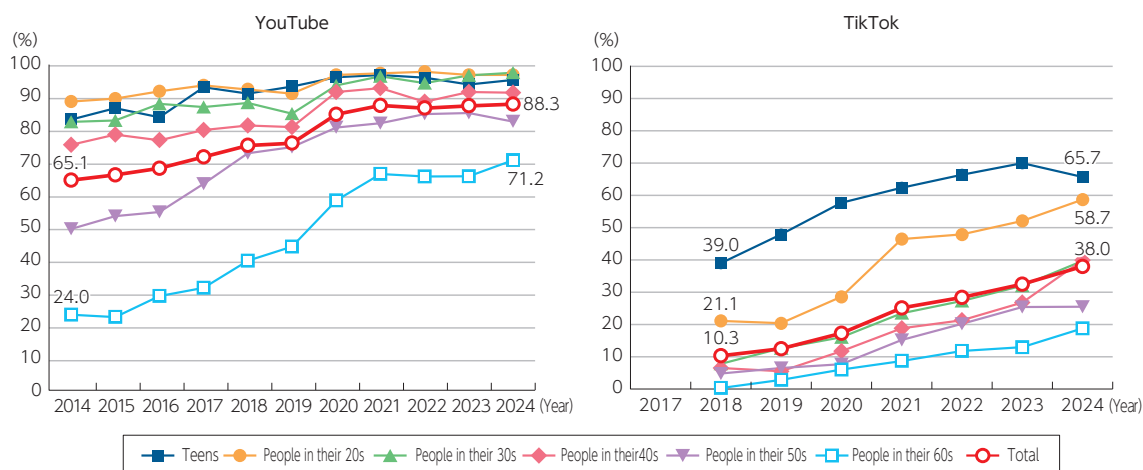
(Source) Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"

Looking at usage trends for individual video sharing services, YouTube, for example, shows high usage rate across almost all generations, exceeding 80% of all generations up to their 50s in 2024, and over 70% of people in

their 60s are using it. TikTok usage has grown significantly in recent years, especially among teenagers and people in their 20s, and it exceeded 50% among both generations in 2024 (Figure 1-1-1-5).

³ The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.

⁴ The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.

Figure 1-1-1-5 Changes in usage rates of YouTube and TikTok (by age group)⁵

(Source) Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"

Additionally, among video streaming services, Amazon Prime Video and Netflix have seen particularly high

usage rates in recent years.



Figure (related data) Changes in usage rates of various video services

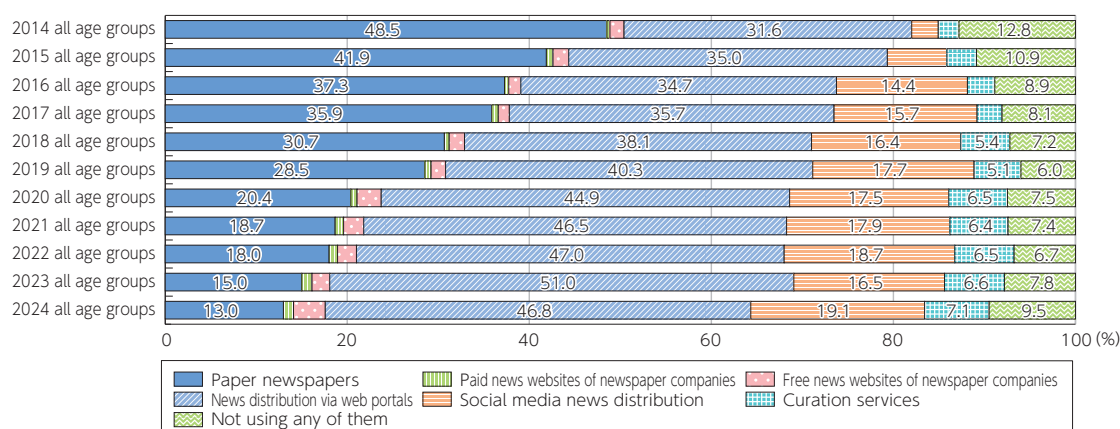
Source: Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00009>
 (Data collection)

(4) Information gathering means

With the expansion of Internet portal sites and news distribution via social media, and the increasing SNS usage rate, the Internet is becoming an important means for people to gather information.

For example, the most commonly used text-based news services are news distribution via portal sites, news distribution via social media, and curation services,⁶ the sum of which accounted for 36.8% in 2014 and rose to 73.0% in 2024⁷ (Figure 1-1-1-6).

Additionally, according to a survey conducted by the Japan Press Research Institute in 2024, when asked about their impressions of each medium, a higher percentage of all generations up to their 50s answered that the Internet was "an indispensable source of information" than newspapers or television, suggesting that the Internet is becoming increasingly seen as an indispensable source of information (Figure 1-1-1-7).

Figure 1-1-1-6 Changes in the most commonly used text-based news services⁸

(Source) Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"

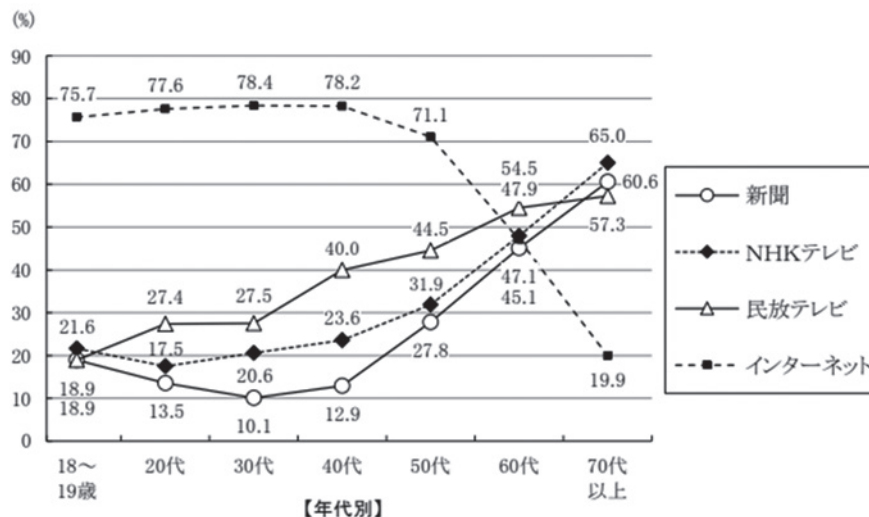
⁵ The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.

⁶ News apps such as SmartNews, Gunosy, and NewsPicks

⁷ The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.

⁸ The total usage rate for 2024 is calculated based on usage rates for people in their teens to 60s.

Figure 1-1-1-7 Indispensability of each medium as a source of information (by age group, 2024)



(Source) Japan Press Research Institute (2024) "The 17th National Public Opinion Survey on Media"

Furthermore, according to a survey conducted in 2024 by an organization of the University of Oxford in the UK, the usage rate of social media for news purposes in Japan is high for YouTube, X, and LINE. In particular, about 30% of all generations use YouTube for news pur-

poses (Figure 1-1-1-8). On the other hand, in terms of media reliability, the reliability of the Internet is lower than that of TV and newspapers for all generations (Figure 1-1-1-9).

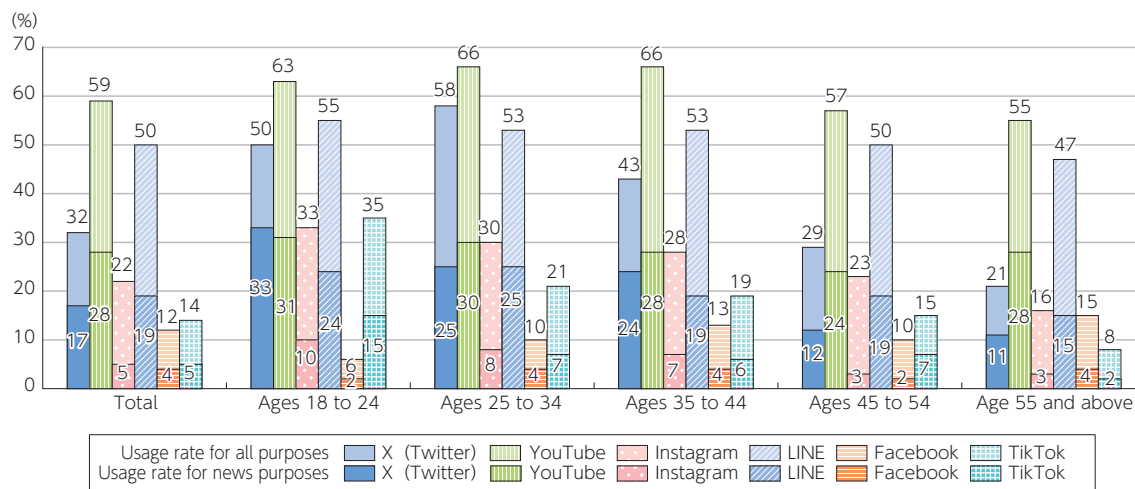
Figure 1-1-1-8 Usage rate of social media as a news source (by age group, all respondents in Japan, 2024)⁹(Source) Prepared from the Reuters Institute for the Study of Journalism "Digital News Report" (2024)¹⁰

Figure 1-1-1-9 Reliability of media (by age group, 2024)

		Television	Newspaper	Internet	Magazine
Total	All age groups (N=1,800)	58.2%	59.9%	27.0%	15.7%
Age groups	Teens [N=140]	52.1%	57.9%	24.3%	18.6%
	People in their 20s [N=218]	46.8%	50.0%	28.0%	17.4%
	People in their 30s [N=237]	43.5%	43.0%	29.1%	17.3%
	People in their 40s [N=306]	54.6%	54.9%	31.7%	19.0%
	People in their 50s [N=330]	63.0%	66.4%	33.0%	15.2%
	People in their 60s [N=271]	66.4%	69.4%	22.5%	13.3%
	People in their 70s [N=298]	72.1%	71.1%	18.5%	11.4%

(Source) Prepared from the MIC "Survey on Information and Communication Media Usage Time and Information Behavior"

⁹ In this survey, respondents were asked whether they used the Internet within the past week. On the other hand, in MIC "Survey on Information and Communication Media Usage Time and Information Behavior" (Figure 1-1-1-2, Figure 1-1-1-3, Figure 1-1-1-5), respondents were asked about the use of the Internet without particular restrictions on the period of use.

¹⁰ <https://reutersinstitute.politics.ox.ac.uk/digital-news-report/2024>

(5) Shopping, payment

Internet use for shopping purposes is also increasing year by year. According to a survey by the Ministry of Economy, Trade and Industry (METI), the size of the e-commerce (EC) market between businesses and consumers (B2C) has been expanding in recent years in the areas of merchandise sales, services and the digital field. The items available for purchase through e-commerce are expanding beyond books and home appliances

to include household goods and clothing.

Payment methods are shifting from cash to cashless payments. According to a survey by the METI, the percentage of cashless payments has been steadily increasing, reaching 42.8% in 2024. The use of QR code payment is also continuing to expand, accounting for 9.6% of all cashless payments as of 2024.



Figure (related data) Changes in cashless payment amounts and its percentage

Source: METI "2024 Ratio of Cashless Payment Among the Total Amount Paid by Consumers Calculated"
 < <https://www.meti.go.jp/press/2024/03/20250331005/20250331005.html>> (Reference May 9, 2025)
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00016>
 (Data collection)

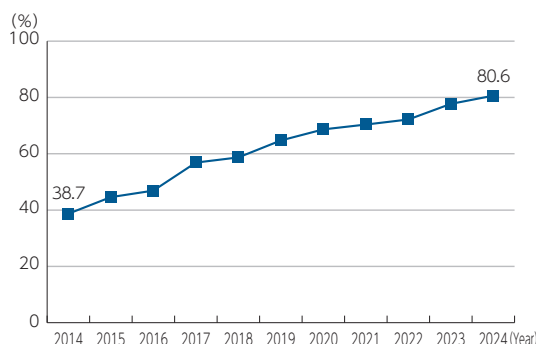
2. Penetration and Expansion of Digital Technologies in Corporate Activities

(1) Cloud services

The use of cloud services in general by companies is expanding year by year. Combining company-wide use and use at some business locations or departments, 80.6% of companies used cloud services in 2024 (**Figure 1-1-1-12**). The services for which cloud is used are diverse, with particularly high usage rates for "file stor-

age and data sharing," "internal information sharing and portal," "email," "payroll, financial accounting, and human resources management," and "schedule sharing," and cloud usage continues to grow steadily (**Figure 1-1-1-13**).

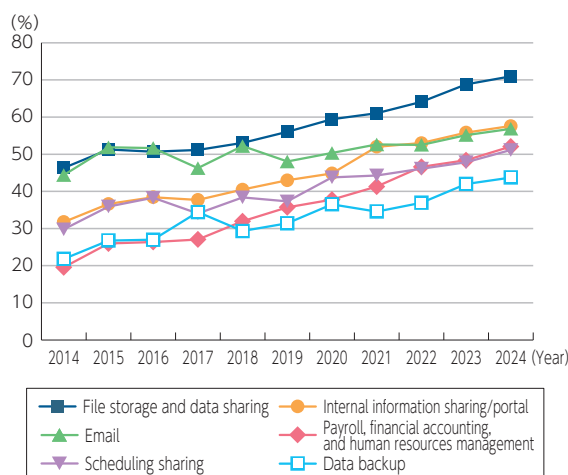
Figure 1-1-1-12 Changes in the use of cloud services



* Combined company-wide use and use at some business locations or departments

(Source) Prepared from the MIC "Communication Usage Trend Survey"

Figure 1-1-1-13 Changes in the use of cloud services (by usage purpose)



* The survey is aimed at companies that use cloud services.

(Source) Prepared from the MIC "Communication Usage Trend Survey"

(2) Customer contact and transactions between businesses

The use of digital space is becoming increasingly important for information dissemination including advertising from companies to customers.

Internet advertising expenditures reached 3.7 trillion yen in 2024, accounting for 47.6% of total advertising expenditures. Since the Internet overtook the four mass media outlets¹¹ in 2021, the gap has been widening.¹²

Additionally, the use of SNS as a corporate advertising

medium is also expanding. According to a survey by Teikoku Databank, in 2023, 40.8% of companies used SNS to disseminate information externally, with the rate of SNS use being particularly high among B2C companies.

The size of business-to-business (B2B) e-commerce (EC) market is expanding as EC advances, and according to a survey by the METI, the EC rate was 40.0% in 2023.



Figure (related data) SNS usage status for external parties

Source: Teikoku Databank (2023) "Questionnaire on trends in the use of SNS in businesses"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00019>
(Data collection)



Figure (related data) Changes in the size of the business-to-business e-commerce market

Source: METI "E-commerce market survey"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00020>
(Data collection)

3. Penetration and Expansion of Digital Technologies in Administrative Services

Administrative procedures, one area where digital technologies are being utilized in government agencies, are also seeing increased use of online services.

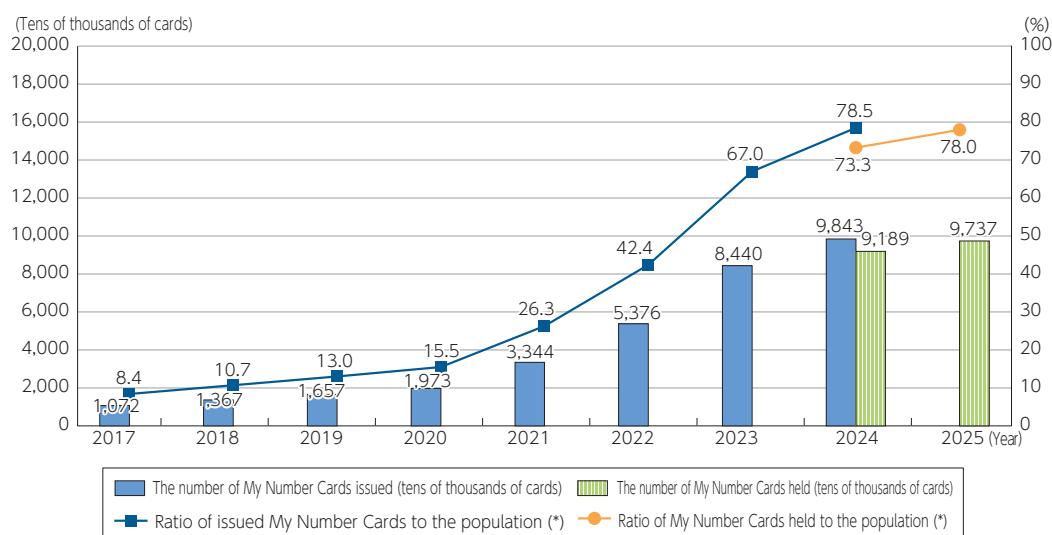
For example, the number of My Number Cards held by the population (calculated by subtracting cards abolished due to death or expiration from the total number issued), which serve as the basis for identity verification in electronic applications, reached 78.0% of the population as of the end of February 2025 (Figure 1-1-1-14).

The use of electronic filing is also increasing in various fields. For example, according to the National Tax

Agency, out of the total number of filing procedures, the proportion of corporate tax returns using e-Tax reached 86.2% as of FY2023, and 69.3% for income tax returns, indicating steady increase. In particular, the use of personal income tax returns has increased significantly from 44.0% in FY2018, due to factors such as the widespread use of My Number Cards.

In the "Priority Plan for Realizing a Digital Society," the online usage rate for procedures that local governments are expected to prioritize for going online was 57.6% in FY2022¹³.

Figure 1-1-1-14 Changes in the Status of Spread of My Number Card



* The number of My Number Cards issued as of March of each year (April for 2019, January for 2025)

(Note) From 2024 onward, the number of My Number Cards held (calculated by subtracting cards abolished due to death or expiration from the total number issued) is listed

(Source) Prepared from MIC "The Status of Issuance of My Number Card"

¹¹ Newspaper, magazine, radio, television media

¹² Refer to "Advertising" in Section 3, 2 (2), Chapter 1, Part II

¹³ Refer to "Trends in digital usage in administration" in Section 11 (3), Chapter 1, Part II

4. Importance and Indispensability of Digital Services in Everyday Life and Corporate Activities

(1) Everyday life

A questionnaire survey for individuals was conducted regarding their usage of digital services, such as, among others, information gathering and dissemination on SNS and shopping. In the survey, respondents were asked about the impact of each digital service for which they said “I usually use” if the service was suspended, and the possibility of using other services as an alternative.

As a result, regarding the impact of a service suspension, over 40% of respondents answered, referring to stock trading, online banking, payment, settlement, or messaging services, if they are suspended, “It would cause major disruption to their daily lives.” As for the impact of the service suspension, a high percentage of respondents said, regarding a wide range of digital services, “Although there are alternative services, it would

be very inconvenient.” The results are considered to indicate that a wide range of digital services are widely recognized as being high in their “indispensability” and “importance.”

When respondents were asked about the challenges of replacing the services they currently use with services from other companies, a high percentage of respondents cited issues with “SNS” and “messaging services” in terms of connections with people and data, and with “schedule management” and “file sharing” in terms of the difficulty of transferring stored data. These reasons are considered to partly explain why the users of digital services have difficulty changing to alternative digital services provided by other companies.



Figure (related data) Impact of service suspension (Services the respondents said “I usually use”)

Source: MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00023>

(Data collection)



Figure (related data) Possibility of changing to other alternative services (Services the respondents said “I usually use”)

Source: MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00024>

(Data collection)

(2) Business activities

Regarding the operations that use cloud services in companies, a questionnaire survey was conducted on each cloud service that respondents answered, “We use it (either almost all, about half, or only some)” to find out the impact of the service if suspended and the possibility of replacing it with another service.

As a result, it was found out that the cloud services used by companies that have a significant impact, such as “it would be difficult to continue business activities without the service” or “it would cause major disruption to business operations without the service,” cover a wide range of fields, including “email,” “file storage and data sharing,” “internal information sharing,” “payroll, financial accounting, and human resources management,” and “data backup.” This is considered to indicate

that cloud services have become an important and indispensable part of today’s business activities.

Additionally, when asked about challenges in replacing their current cloud services with other cloud services or in-house built systems, respondents cited increased operational costs and reduced service levels as the most significant issues across many services. On the other hand, the percentage of respondents who said there were no alternative services was generally low. Regarding the cloud services currently used by companies, even if there are alternative services available, it is suggested that it would be difficult to replace them with other services from the perspective of cost and service level maintenance.



Figure (related data) Position of cloud services currently in use

Source: MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00025>

(Data collection)



Figure (related data) Possibility of replacing their current cloud services with other cloud services or in-house built systems

Source: MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00026>

(Data collection)

Section 2 Trends in Explosive AI Progress

AI continues to evolve explosively, with progress being made in the development of large-scale general-purpose Large Language Models, while new technologies are emerging every day, and it is pointed out that this is a field with great potential for technological change. Furthermore, the AI field, which requires huge investments, tends to be led by overseas big tech companies (giant digital companies with global influence) and overseas startups with AI talent and advanced technology

that receive huge investments.

Amidst this trend, while Japan's presence in the AI field is not necessarily high on a global scale, domestic companies and organizations are actively engaged in technological development, including model development.

As AI continues to evolve, penetrate and integrate across all digital fields, it is increasingly likely to become a fundamental element underpinning the digital society.

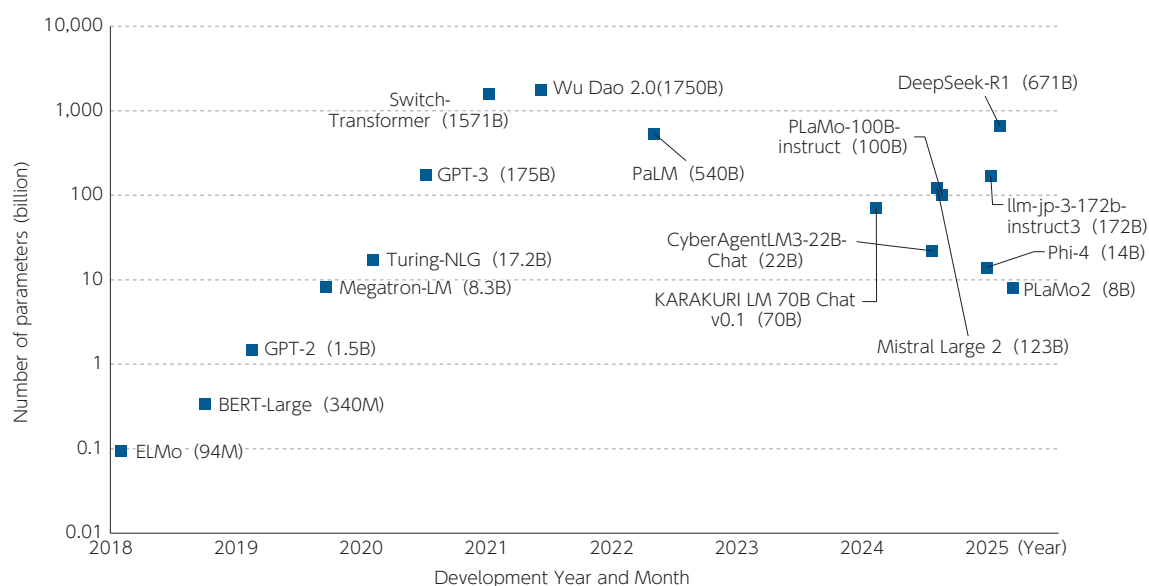
1. Current Status and Trends in AI Technology Development

(1) Intensifying global AI development race

AI comes in many forms, but one of the major trends in recent AI technology development and applications is “generative AI,” which generates text, images, videos, etc., and one of the technologies within this is the Large Language Model (LLM), which applies deep learning technology. In 2020, OpenAI proposed the Scaling Law, stating that the performance of LLM improves as the size of the data used for learning, the amount of calculations used for learning, and the number of model param-

eters increase. For example, while the GPT-2 model announced by OpenAI in 2019 had 1.5 billion parameters, the parameters in GPT-3, announced by the company in 2020, were scaled up to approximately 175 billion, about 120 times larger. The trend toward larger scale has continued since then, with the number of parameters in PaLM announced by Google in April 2022 reaching 540 billion (Figure 1-1-2-1).

Figure 1-1-2-1 Changes in the number of Large Language Model (LLM) parameters¹



(Source) Prepared from the University of Tokyo Matsuo Laboratory “AI Evolution and Japan’s Strategy” (2023) and presentation materials by development organizations

Following the Scaling Law, investment in computing resources such as GPU and data centers has intensified, particularly among big tech companies. Furthermore, startups such as OpenAI, Anthropic, and Mistral AI,

which have received massive investments from big tech companies and venture capital firms, have also become major players in LLM development and are participating in the development race.



Figure (related data) Investment status of major AI developers

Source: Prepared from related reports and materials

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00028>

(Data collection)

¹ This figure does not include models for which the number of parameters has not been published. Note that the number of parameters for recent LLMs is often not disclosed.

(2) Recent trends in AI research and development

The AI field is one where new technologies and models are announced daily, and technological innovation is advancing at a remarkable pace. While it is not possible

to describe all of these technological innovations, the major technological trends that have recently emerged will be discussed, focusing on the LLM field.

A LLM research and development trends

(A) Emergence of reasoning models

In September 2024, OpenAI announced the development of the “OpenAI o1” series as a reasoning model for solving difficult problems. o1 outperformed OpenAI’s GPT-4o model on numerous evaluation metrics in the fields of science, code generation, and mathematics, areas where conventional generative AI has traditionally struggled. For example, in the U.S. Mathematical Olympiad Preliminary Round, o1 was able to solve approxi-

mately 83% of the problems. This is considered to be an academic achievement comparable to the top 500 students in the U.S. o1 also outperformed experts with doctorates in the performance evaluation index of expertise in chemistry, physics, and biology². It was also reported that when the o1 model was used to solve the 2025 University of Tokyo entrance exam questions,³ it achieved a higher score than the minimum passing score⁴.

(B) An open model developed by a Chinese AI startup and its impact on the market

In January 2025, Chinese AI startup DeepSeek announced the development of “DeepSeek-R1.” This model is said to achieve performance equivalent to OpenAI’s reasoning model “o1” through various technical innovations⁵. DeepSeek-R1 has garnered particular attention for being made openly available to anyone, being developed by an emerging Chinese startup, and its low development cost⁶.

Immediately after the announcement of DeepSeek-R1, the stock prices of semiconductor companies and companies that provide AI infrastructure through cloud ser-

vices, etc. fell, affecting all AI-related stocks. The emergence of DeepSeek-R1, which is said to have achieved both low cost and high performance, may have caused the fall of such stock prices as it cast doubt on the long-held belief that developing high-performance models requires massive investment.

However, developing and operating advanced AI requires more data processing, and if costs further decrease, the number of developers and users is expected to increase, therefore, it is suggested that demand for AI semiconductors will actually increase^{7,8}.

(C) Development of relatively small language models

While the competition to develop LLMs is intensifying, attention is also being paid to the development of models that are composed of LLMs with relatively fewer parameters. Generally, the more parameters an LLM has, the higher its learning ability. However, due to their large scale, their services are often provided only via cloud services or APIs, which can result in long response times due to the massive amount of computational processing, and the input data may be used as training data by the LLM provider. On the other hand, small scale models are relatively lightweight and capa-

ble of fast processing, making them advantageous in environments without network connectivity (local environments) or for specific applications. As a result, their development is being actively pursued.

For example, Microsoft has developed the “Phi” series as a small scale model, and released the 14 billion parameter “Phi-4” in December 2024. Phi-4 is a model capable of complex reasoning, and is said to have outperformed other companies’ models of the same size in mathematics competition problems⁹.

² OpenAI “Learning to reason with LLMs” <<https://openai.com/index/learning-to-reason-with-llms/>> (Reference March 11, 2025)

³ The Common Test for University Admissions and the University of Tokyo Second Stage Examination

⁴ Kyodo News (April 5, 2025) “AI Meets the ‘Passing Standard’ for the University of Tokyo, College of Arts and Sciences, Science III Exams: Exceeds the Minimum Passing Score for 2025 Entrance Exams” <<https://nordot.app/1281148575208423464/>> (Reference April 14, 2025)

⁵ DeepSeek-R1 and its predecessor, DeepSeek-V3, are said to have achieved high performance at low cost through various technological innovations. For example, DeepSeek-V3 employs a technique called MoE (Mixture of Experts), which incorporates multiple specialized units (Experts) called upon for each input. To optimize the parallel computation required for this, various innovations were implemented (based on an interview with Okanohara Daisuke, CEO of Preferred Networks).

⁶ DeepSeek explains that it costs approximately \$5.6 million (approximately 860 million yen) to develop one model. According to development cost calculations by Stanford University, the U.S. Google’s “Gemini Ultra” cost \$191 million and OpenAI’s “GPT-4” cost \$78 million, which means an even simple comparison with these costs shows the DeepSeek model was developed at less than one-tenth the cost of the major American companies. It should be noted that the figures cited in the paper may not represent the total cost of the entire development process. While there is debate regarding the development costs, many within the U.S. tech industry view the DeepSeek model as having been developed at a significantly lower cost compared to previous costs. Nikkei “DeepSeek Shock: AI Development Costs ‘Less Than One-Tenth’ Using Open-Source Technology” <<https://www.nikkei.com/article/DGXZQOGN27CE40X20C25A1000000/>> (Reference March 12, 2025)

⁷ Based on expert interviews (including Kinoshita Masafumi, Executive Officer, ABEJA, Inc.).

⁸ Meta announced plans to invest up to \$65 billion in AI-related projects by 2025, while Alphabet, the parent company of the U.S. Google, expects to spend \$75 billion on capital expenditures for data centers and AI infrastructure development in 2025. (Bloomberg “Meta Shares Rise, Longest Streak of 12 Consecutive Gains -Market Cap Gains \$240 Billion” (February 5, 2025) <<https://www.bloomberg.co.jp/news/articles/2025-02-04/SR63J7DWLU6800>> (Reference March 18, 2025), Bloomberg “Alphabet shares plummet revenue falls short of expectations -cloud growth slows” (February 5, 2025) <<https://www.bloomberg.co.jp/news/articles/2025-02-04/SR6G6DT0AFB400>> (From reference March 18, 2025)

⁹ Microsoft, “Introducing Phi-4: Microsoft’s Newest Small Language Model Specializing in Complex Reasoning” <<https://techcommunity.microsoft.com/blog/aiplatformblog/introducing-phi-4-microsoft%E2%80%99s-newest-small-language-model-specializing-in-comple/4357090>> (Reference March 16, 2025)

B AI agents

As generative AI advances, services called “AI agents” are becoming more widespread. The definition of an AI agent varies depending on the development company, but recently, it is thought that the term AI agent tends to refer to what has the ability to automatically determine tasks (and subdivide tasks as necessary) and carry out processing in response to set goals or instructions given in natural language.

Since the second half of 2024, many services claiming to be “AI agents” have been developed and launched

(Figure 1-1-2-2). Some point out that AI agents themselves are not particularly technologically advanced.¹⁰ However, it is true that advances in LLMs are enabling AI to handle more complex tasks, such as multimodal AI that can process multiple data formats such as text, images, audio, and video in an integrated manner, and reasoning models that are capable of logical thinking. It is expected that more user-friendly services leveraging LLMs and other technologies will emerge in the future.

Figure 1-1-2-2 Service overview and definition of so-called “AI agents”

Company name	Service overview
Microsoft	· Three types of AI agents, including built-in agents integrated into Microsoft 365 Copilot are offered. The built-in agents are embedded in various Microsoft 365 apps and can play the roles of interpreter, facilitator, self-service, project manager, etc.
Salesforce	· In October 2024, the company announced that it would offer the autonomous AI agent “Agentforce” in Japan. Responding to customers in natural language, arranging appointments with prospective customers, coaching sales representatives through role-playing, and assisting with narrowing down customer segments and creating content for campaign development.
Amazon Web Services	· “Agents for Amazon Bedrock,” a service for developing AI agents, is offered. The acquired information can be used to respond to user instructions and tasks. The system also includes enhanced functionality to track the process the AI agent executed to arrive at the final answer after the user entered instructions, as well as enhanced functionality to improve response accuracy.
OpenAI	· In January 2025, the company announced the launch of “Operator,” an AI agent service in which the AI performs tasks on behalf of users. When the user inputs the task they want to perform, the AI reads the screen like a screenshot and executes it.
Anthropic	· In October 2024, the company announced the development of “computer use,” an AI that operates computers on behalf of people. The screen the user is viewing on their computer is recognized as a screenshot converted into image data, and operations such as moving the cursor, clicking, and entering text can be performed.
Company name	Definition of an AI agent
Microsoft	A system designed to perform specific tasks, answer questions, and automate a series of processes on behalf of a user ¹¹ .
Salesforce	An intelligent system that can understand and respond to user inquiries without human intervention ¹² .
Amazon Web Services	A software program that interacts with its environment, collects data, and uses that data to perform self-determined tasks to achieve predetermined goals. Humans set the goals, but the AI agent independently chooses the optimal actions it needs to take to achieve them ¹³ .

(Note) As this information is based on materials from each company at the time of announcement, it may differ from the current service content and definitions.

(Source) Prepared from reference materials from each company and related reports¹⁴

¹⁰ Based on an interview with Professor Satoshi Kurihara of Keio University.

¹¹ Microsoft “What is an AI Agent?” <<https://learn.microsoft.com/ja-jp/azure/cosmos-db/ai-agents>> (Reference March 13, 2025)

¹² Salesforce “What is an AI Agent – The Complete Guide” <<https://www.salesforce.com/jp/agentforce/what-are-ai-agents/>> (Reference March 13, 2025)

¹³ Amazon “What is an AI Agent?” <<https://aws.amazon.com/jp/what-is/ai-agents/>> (Reference March 13, 2025)

¹⁴ Microsoft, “Operational Efficiency and Innovation Enabled by AI Agents: Latest Case Studies from Japan” (December 18, 2024 <<https://news.microsoft.com/ja-jp/2024/12/18/241218-operational-efficiency-and-innovation-enabled-by-ai-agents-latest-case-studies-from-japan/>> (Reference March 18, 2025), NIKKEI X Tech, “MS Announces Genuine AI Agent, CEO Nadella Aims for an ‘Agentic World’” (November 20, 2024) <<https://xtech.nikkei.com/atcl/nxt/column/18/03012/112000001/>> (Reference March 18, 2025), Salesforce “Agentforce” <<https://www.salesforce.com/jp/agentforce/>> (Reference March 17, 2025), NTT EAST “Explanation of AI Agents and Amazon Bedrock Agents” (March 12, 2025) <<https://business.ntt-east.co.jp/content/cloudsolution/column-578.html>> (Reference March 18, 2025), NIKKEI X Tech “AWS, Google, and MS’s AI Agent Development Services Enable Building AI Agents without Coding” (October 10, 2024) <<https://xtech.nikkei.com/atcl/nxt/column/18/02968/100100003/>> (Reference March 18, 2025), NIKKEI X Tech “Open AI has Announced its AI agent ‘Operator,’ which Executes User-Directed Tasks Using its Own Custom Browser” <<https://xtech.nikkei.com/atcl/nxt/news/24/02098/>> (Reference March 17, 2025), NIKKEI “AI Developed by Anthropic in the U.S. to Operate Computers on Behalf of Humans” (October 23, 2024) <<https://www.nikkei.com/nkd/company/us/CRM/news/?DisplayType=1&ng=DGXZQOGN22DYL022102024000000>> (Reference March 17, 2025), Bloomberg “Anthropic Reveals New AI Tool, Making the Experience More Intuitive” (October 23, 2024) <<https://www.bloomberg.co.jp/news/articles/2024-10-23/SLS7T9T0AFB400>> (Reference March 17, 2025)

C AI Robotics

Competition for development and investment in the field of AI robotics, which applies AI technology to robotics, is heating up. The background to this is that dramatic innovations in image recognition and natural language processing in the field of AI have made flexible and complex processing possible, and robots are expected to replace labor in developed countries overseas where there are concerns about labor shortages due to declining birthrates and aging populations.

For example, as one area of such trend, the development of humanoid robots has recently become active. There is no clear definition of a humanoid robot, but it is generally modeled after the shape and capabilities of a human, and is designed to handle a wide range of tasks, from use in factories, such as grasping objects and arranging parts, to tasks intended for use in the home,

such as folding laundry. Because humanoid robots have a human-like shape, they are thought to be easily introduced into human-centered social infrastructure, and it is expected that in the future they will be able to assist or replace human tasks¹⁵.

Against this backdrop, the race to develop humanoid robots for commercialization is heating up, particularly in the U.S. and China. Currently, humanoid robots are being developed for pilot deployment in manufacturing sites and factories and for industrial use, but some companies are aiming to create humanoid robots that can be used in everyday life, such as for household chores and entertainment in the long run. It is expected that research and development into highly versatile robots will continue in the future (Figure 1-1-2-3).

Figure 1-1-2-3 Humanoid robot development examples

Company name/Model name	Characteristics/Direction
Tesla (U.S.) Optimus	·In October 2024, the company unveiled the humanoid robot "Optimus." ·In addition to industrial use, the robot can also be used for everyday purposes such as household chores and entertainment. ·The company plans to produce small quantities for its own factories in 2025, and mass-produce for other companies in 2026.
Figure AI (U.S.) Figure 02	·In August 2024, the company announced its new humanoid robot, "Figure 02." ·In partnership with Open AI, the humanoid robot incorporates a voice recognition system that can have natural conversations with humans. ·A pilot introduction of the humanoid robot was conducted at a BMW plant. ·The company aims to alleviate labor shortages and improve industrial efficiency, while also considering developing a consumer version.
Agility Robotics (U.S.) Digit	·In March 2023, the company announced the next generation model of the bipedal multipurpose robot "Digit." ·Designed to work with humans in logistics facilities such as warehouses.
Boston Dynamics (U.S.) Atlas	·In April 2024, the company announced the fully electric robot "Atlas" as the successor to its previous hydraulic model "HD Atlas." Compared with conventional hydraulic models, the new robot has a wider range of motion. ·In 2025, a pilot introduction of the new robot will be conducted at an automobile manufacturing plant, with the aim of using it in the industrial sector.
Unitree Robotics (China) G1	·In May 2024, the company announced the bipedal humanoid robot "G1." It features a balancing system that allows it to continue walking without falling over even when pushed by a person, and a joint mechanism with a wide range of motion. ·The price starts at \$16,000 (approximately 2.5 million yen), making it a low-cost option that will encourage social implementation.
Pudu Robotics (China) PUDU D9	·In December 2024, the company announced its first bipedal humanoid robot, "PUDU D9." It walks on two legs at the same speed as an adult, 2m/s, and can handle a variety of terrain, including stairs, slopes, and uneven ground.

(Source) Prepared from reference materials¹⁶

¹⁵ Mitsui & Co. Global Strategic Studies Institute "Humanoid Robots - Technological Advancement Driven by Generative AI and the Beginning of Pilot Introduction" <https://www.mitsui.com/mgssi/ja/report/detail/_icsFiles/afiedfile/2025/02/07/2501btf_tsuji_matsuura.pdf> (Reference March 19, 2025)

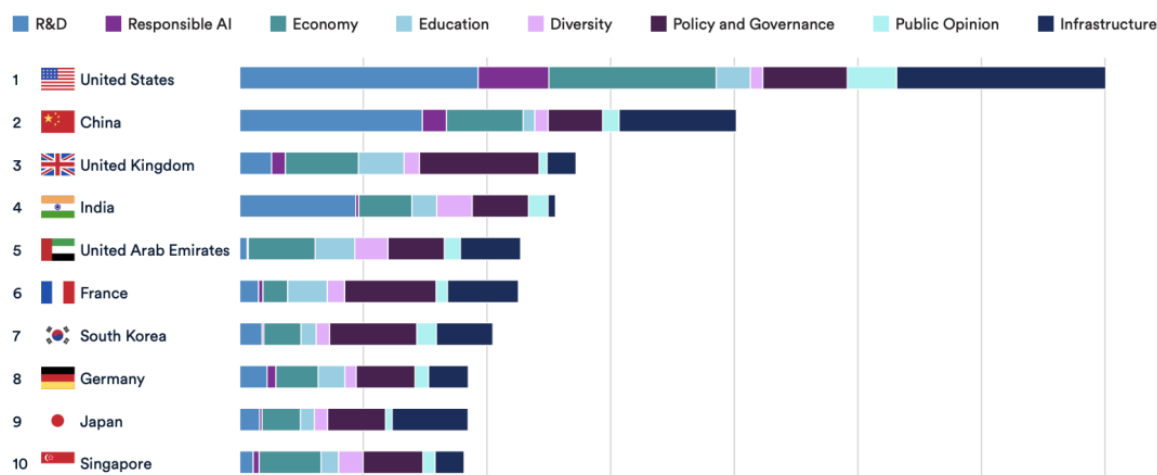
¹⁶ NIKKEI "Tesla Unveils Humanoid Robot Performing Household Chores and Other Everyday Tasks" (October 11, 2024) <https://www.nikkei.com/article/DGXZQOGN114AB0R11C24A0000000/> (Reference March 19, 2025), Ledge.ai "Figure, in Partnership with Open AI, Unveils New Humanoid Robot "Figure 02" and Successfully Tests with BMW for Practical Use in Automotive Manufacturing" (August 11, 2024) <<https://ledge.ai/articles/figure02>>, CNET Japan "Revamps Ability Robotics, Bipedal Robot "Digit" (April 4, 2023) <<https://japan.cnet.com/article/35202097/>> (Reference March 19, 2025), NIKKEI X Tech "Interview with Boston Dynamics, Humanoid Robots, Starting as Automobile Plant Workers" (March 19, 2025) <https://xtech.nikkei.com/atcl/nxt/column/18/03118/00004/> (reference March 19, 2025), NIKKEI X Tech "Where are Bipedal Humanoid Robots Headed? AI Advancement are Reaccelerating the Development Race among Overseas Companies" (July 31, 2024) <<https://xtech.nikkei.com/atcl/nxt/mag/nmc/18/00011/00263/?P=3>> (Reference March 19, 2025), NIKKEI X Tech "Lower Prices Drive Social Implementation, Developing a Wide Range of Applications from Factories to Homes" (January 31, 2025) <<https://xtech.nikkei.com/atcl/nxt/mag/nmc/18/00163/00004/?P=3>> (Reference March 19, 2025), Unitree <<https://www.unitree.com/g1>> (Reference March 19, 2025), PRTIMES "PUDU Unveils its First Full-sized Humanoid Robot "PUDU D9" (December 20, 2024) <<https://prtmes.jp/main/html/rd/p/000000051.000087027.html>>

(3) Trends in AI development and business expansion in Japan

Looking at various evaluation reports on AI, it cannot be said that Japan is highly rated compared with other world-leading countries in terms of its AI research and development capabilities and utilization of AI. For example, according to the 2023 Global AI vibrancy ranking released by Stanford University's HAI (Human-Centered Artificial Intelligence) in November 2024, Japan is ranked 9th overall, lagging behind countries such as the

U.S., China, and the UK (**Figure 1-1-2-4**). In addition, in AIRankings, which ranks AI research capabilities based on factors such as the number of papers on AI, the top countries in recent years have been the U.S., China, the UK, and Germany, in that order, with Japan hovering around 11th or 12th place. However, Japanese companies and organizations are also taking various steps toward AI development.

Figure 1-1-2-4 Global AI vibrancy ranking: top ten countries (2023)



(Source) Stanford University Human-Centered Artificial Intelligence(2024) "Global AI Vibrancy Tool"¹⁷



Figure (related data) Changes of AI rankings by country

Source: Prepared based on AIRankings (data obtained on February 25, 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00032>

(Data collection)

A LLM research and development trends

While overseas big tech companies and AI startups are globally leading the development of LLMs, Japanese organizations are also working on developing LLMs. Compared with the world's most cutting-edge models,

Japanese models tend to be relatively small-scale. In addition, in recent years, development has also progressed on relatively small-scale yet high-performance models (**Figure 1-1-2-5**).

¹⁷ Stanford University "Global AI Vibrancy Tool" <<https://hai.stanford.edu/ai-index/global-vibrancy-tool>> (Reference March 14, 2025)

Figure 1-1-2-5 Examples of LLM development by Japanese organizations

Development organization: Model name (number of parameters)	Announcement date	Overview
Tokyo Institute of Technology (currently Institute of Science Tokyo), Tohoku University, Fujitsu Limited, RIKEN, Nagoya University, CyberAgent Inc., Kotoba Technologies Inc.: Fugaku-LLM (about 13 billion)	May 2024	Learning is done using the supercomputer “Fugaku.” Improved Japanese performance by having Fugaku learn original data from scratch. Demonstrated high performance in an evaluation index for Japanese, particularly well in humanities and social science tasks. Excellent in terms of transparency and security as the entire learning process can be monitored ¹⁸ .
CyberAgent: CyberAgentLM3-22B-Chat (about 22.5 billion)	July 2024	The model was developed without being based on any existing models. Its Japanese proficiency is on par with Meta’s model “Meta-Llama-3-70B Instruct” ¹⁹ .
Fujitsu and Cohere Inc: Takane (unknown number of parameters)	September 2024	This model was developed based on the LLM from Canadian AI startup Cohere and can be used for highly specialized tasks. This LLM achieved the world’s highest record in terms of the Japanese language performance evaluation index (at that time). This model can be used in a secure private environment ²⁰ .
National Institute of Advanced Industrial Science and Technology and Institute of Science Tokyo (A research team led by Professors Okazaki Naoaki and Yokota Rio): Llama 3.1 Swallow (about 8 billion/ about 70 billion)	October 2024	While maintaining the capabilities of a large language model (Meta’s Llama 3.1) with high English proficiency, the model succeeded in improving Japanese language understanding, generation, and dialogue capabilities ²¹ .
Preferred Networks Group ²² : PLaMo-100B (about 100 billion)	October 2024 ²³	It was developed from scratch with proprietary architecture and training data. It achieved high Japanese language performance by surpassing OpenAI’s GPT-4o and others in a Japanese language performance benchmark (Later, “PLaMo2 1B” and “PLaMo2 8B” were developed with the number of parameters reduced) ²⁴ .
National Institute of Informatics llm-jp-3-172b-instruct3 (about 172 billion)	December 2024	Trained a large language model with about 172 billion parameters (the same scale as GPT-3) from scratch at the institute’s Research and Development Center for Large Language Models and made it available to the public ²⁵ .

* Model descriptions are those at the time the press releases were published and models were released by each organization.

(Source) Prepared from published materials of each development organization

The government support measures are supporting such LLM development originating in Japan.

For example, the “GENIAC” project, launched by the METI and the New Energy and Industrial Technology Development Organization (NEDO), supports the provision of computing resources necessary for the development of foundation models. In the first phase (development period for providing computing resources: February to August 2024), the project worked on the development of foundation models for a total of 10 development themes. The second phase began in October 2024, with development of foundation models underway for a total of 20 development themes.

Additionally, in order to strengthen AI development capabilities, the Ministry of Internal Affairs and Communications (MIC) is leading efforts, through the National Institute of Information and Communications

Technology (NICT), to develop and expand the large amount of high-quality training data, primarily in Japanese, required for LLM development, and provide it to Japanese LLM developers²⁶.

Furthermore, the Ministry of Education, Culture, Sports, Science and Technology is leading efforts, through the Inter-University Research Institute Corporation/Research Organization of Information and Systems/National Institute of Informatics (NII), to conduct research and development contributing to the transparency and reliability of generative AI. It is also working to share the knowledge and experience gained through a study group (LLM-jp) that brings together AI researchers and engineers from industry and academia, centered around the NII, in an effort to contribute to fostering research and development capabilities related to generative AI in Japan.

¹⁸ Fujitsu “Release of ‘Fugaku-LLM’ – a large language model trained on the supercomputer ‘Fugaku’” <<https://pr.fujitsu.com/jp/news/2024/05/10.html>> (Reference March 17, 2025)

¹⁹ CyberAgent “publicly releases version 3 of its proprietary Japanese LLM (Large Language Model) - Providing a commercially available model with 22.5 billion parameters” <<https://www.cyberagent.co.jp/news/detail/id=30463>> (Reference March 17, 2025)

²⁰ Fujitsu “launches ‘Takane’ - A large language model for enterprises offering the highest Japanese language proficiency in the world” <<https://pr.fujitsu.com/jp/news/2024/09/30.html>> (Reference March 17, 2025)

²¹ National Institute of Advanced Industrial Science and Technology “releases ‘Llama 3.1 Swallow’ by improving the Japanese language capabilities of the open source LLM” <https://www.aist.go.jp/aist_j/press_release/pr2024/pr20241008_2/pr20241008_2.html> (Reference March 17, 2025)

²² Developed by Preferred Elements, a 100%-owned subsidiary of Preferred Networks

²³ Release date of PLaMo-100B-Pretrained <<https://www.preferred.jp/ja/news/pr20241015/>>. Note that PLaMo-100B-Instruct was announced in August 2024 <<https://tech.preferred.jp/ja/blog/plamo-100b-post-training/>>

²⁴ Preferred Networks “releases PLaMo-100B-Pretrained, a Large Language Model as a result of developing the first cycle of GENIAC” (October 15, 2024) <<https://www.preferred.jp/ja/news/pr20241015/>> (Reference March 17, 2025)

²⁵ National Institute of Informatics “publicly releases ‘llm-jp-172b-instruct3,’ a fully open large language model with about 172 billion parameters (GPT-3 level)” <<https://www.nii.ac.jp/news/release/2024/1224.html>> (Reference March 17, 2025)

²⁶ NICT is using the language data it has built for learning to prototype an LLM with up to 311 billion parameters.

B Trends in AI robotics research and development and social implementation

The U.S. and China are particularly ahead in the research, development, and social implementation of humanoid robots, but in Japan, research and development in the field of AI robotics (including collaboration be-

tween AI and robots) is also being conducted by industry and academia, and efforts are also underway toward social implementation. Here are some examples.

(A) Development of a robot foundation model by the AI Robot Association²⁷

In December 2024, the AI Robot Association (AIRoA), a general incorporated association, was established with the aim of building a robot data ecosystem through the fusion of AI and robots. As AI technology evolves, there is a growing need for foundation models capable of integrating large amounts of data and learning efficiently, even in the field of robotics. However, it has been pointed out that the current market does not have a fully developed framework for sharing and utilizing large

amounts of data, and that development efficiency remains difficult to improve as each company and research institution handles data separately. AIRoA promotes open, large-scale data collection across industry boundaries and the development and publication of foundation models, with the aim of building a scalable robot data ecosystem to realize advanced general-purpose robots.

(B) Social experiment using the guide robot “ugo” and generative AI developed by NTT

A social experiment using the guide robot ‘ugo’ developed by ugo, Inc. that provides autonomous mobile business robots, and several generative AI models, including the NTT-developed LLM “tsuzumi,” began in January 2025 by Osaka Metro, NTT WEST Group, NTT Com-

munications²⁸, and ugo, Inc., in anticipation of an increase in tourists from Japan and abroad visiting EXPO 2025 Osaka, Kansai. The experiment explores ways to improve the ability to respond quickly to questions in multiple languages (**Figure 1-1-2-6**).

Figure 1-1-2-6 Social experiment using multilingual guide robot “ugo” and generative AI “tsuzumi,” etc.



(Source) NTT WEST, Inc.²⁹

C Trends in AI agent development and business expansion

Japanese companies are also making moves regarding AI agents.

For example, in February 2025, SoftBank Group Corp. and OpenAI announced a partnership to develop and sell “Cristal intelligence,” a cutting-edge AI for businesses. The partnership will see SoftBank and OpenAI exclusively sell “Cristal intelligence,” which has AI agent

functions, to major Japanese companies³⁰. SoftBank Group will jointly develop AI agents with OpenAI, and plans to operate its AI data center in Japan.^{31,32}

Fujitsu has also developed and begun offering globally an AI service called “Fujitsu Kozuchi AI Agent” that enables AI to autonomously and collaboratively handle highly challenging tasks.³³

²⁷ NIKKEI X Tech, “Toyota and other major companies join forces to start building a ‘robot foundation model’ originating in Japan” (March 12, 2025) <<https://xtech.nikkei.com/atcl/nxt/column/18/03118/00001/>> (Reference March 21, 2025)

²⁸ NTT Communications changed its company name to “NTTDOCOMO BUSINESS, Inc.” as of July 1, 2025

²⁹ Osaka Metro, NTT WEST Group, NTT Communications, ugo inc. “A social experiment will be conducted at Umeda Station on the Osaka Metro Midotsuji Line, using the multilingual guide robot “ugo” and the generative AI “tsuzumi.” <<https://www.ntt-west.co.jp/news/2501/250108a.html>>

³⁰ SoftBank News: “OpenAI and SoftBank Group go into partnership. “Crystal intelligence,” a cutting-edge AI for businesses, will be offered in Japan, ahead of the rest of the world” (February 5, 2025) <https://www.softbank.jp/sbnews/entry/20250204_02> (Reference March 26, 2025)

³¹ Nikkei “SoftBank, OpenAI to run autonomous AI agents at former Sharp Sakai plant” (March 14, 2025) <<https://www.nikkei.com/article/DGXZQOUC12A7X0S5A310C2000000/>> (Reference March 10, 2025)

³² OpenAI announced the “Stargate Project,” which plans to invest \$500 billion (approximately 78 trillion yen) over four years from 2025 to build a new AI infrastructure for OpenAI in the U.S. SoftBank is among the initial investors. (Open AI “Announcing the Stargate Project” <<https://openai.com/ja-JP/index/announcing-the-stargate-project/>> (Reference March 15, 2025)

³³ Fujitsu “Began offering “Fujitsu Kozuchi AI Agent” in which AI autonomously collaborates with humans to promote advanced business processes” (October 23, 2024) <https://www.nikkei.com/article/DGXZRSP680645_T21C24A000000/?msocid=32429ef1e23f674838988bb8e35b6633> (Reference March 10, 2025)

2. Current status of AI use

(1) Current status of AI use among individuals

In order to understand the current state of AI use among individuals, a survey was conducted targeting the general public (hereinafter referred to as the “FY2024 survey”).

In Japan, the percentage of respondents who answered that they “use (or have used in the past)” some kind of generative AI service was 26.7% in the FY2024 survey. Considering that the percentage of those who answered “I use generative AI (or have used it in the past)” was 9.1% in a survey conducted in FY2023 (hereinafter referred to as the “FY2023 survey”), usage has been expanding (**Figure 1-1-2-7**). In addition, looking at the age groups, 44.7% of people in their 20s responded that they had used AI services in the FY2024 survey (**Figure 1-1-2-8**).

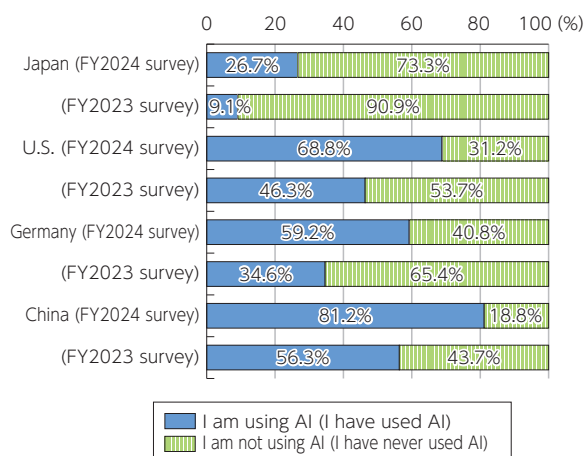
Similar surveys were also conducted in the U.S., Germany, and China, and AI use is expanding in each of these three countries (the percentage of people who

have experience using generative AI increased from 46.3% in the FY2023 survey to 68.8% in the FY2024 survey in the U.S., from 34.6% to 59.2% in Germany, and from 56.3% to 81.2% in China).

In Japan, when people who answered that they “do not use (have never used)” text generation AI services were asked about the reasons for not using them, the most common response was “not necessary for my life or work,” followed by “I don’t know how to use it,” suggesting that the barriers to use are still high. Many also responded that there were “no attractive services” (**Figure 1-1-2-9**).

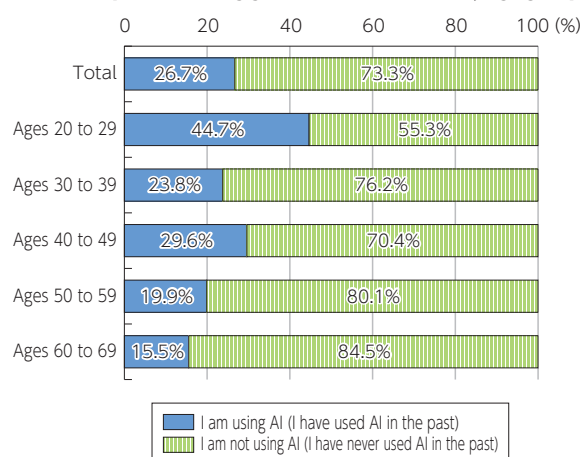
Additionally, when asked about their intention to use AI (including generative AI), there was a relatively high intention to use it for research and content summarization and translation, a trend similar to that seen in the FY2023 survey (**Figure 1-1-2-10**).

Figure 1-1-2-7 Experience using generative AI services (by country)



(Source) MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

Figure 1-1-2-8 Experience using generative AI services (by age group, Japan)



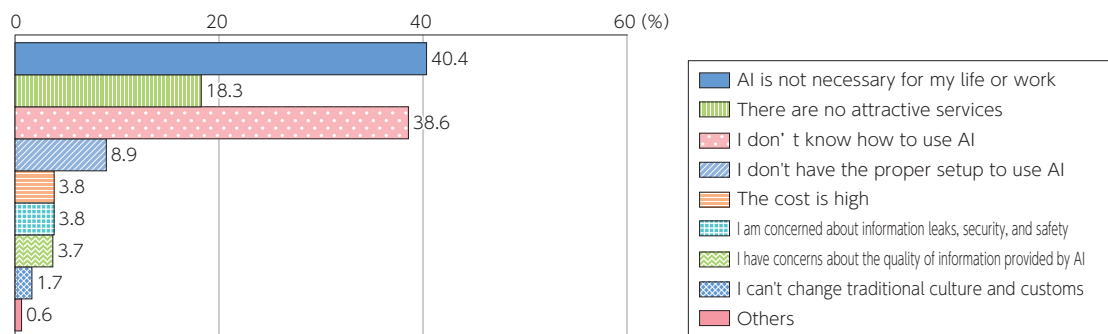
(Source) MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”



Figure (related data) Experience using each generative AI service (Japan, by age group)

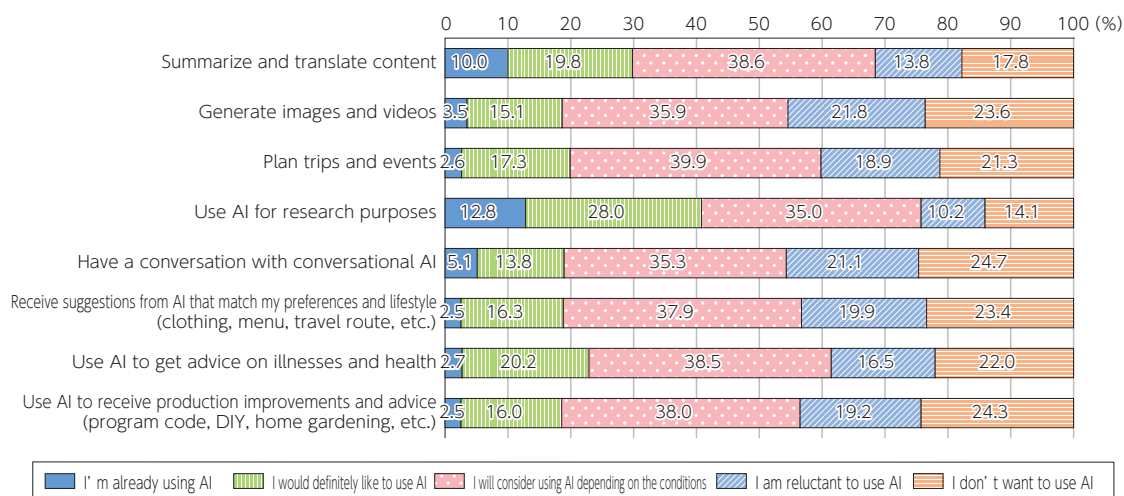
Source: MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00037>
 (Data collection)

Figure 1-1-2-9 Reasons for not using text generation AI services



(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"

Figure 1-1-2-10 Intention to use generative AI and AI

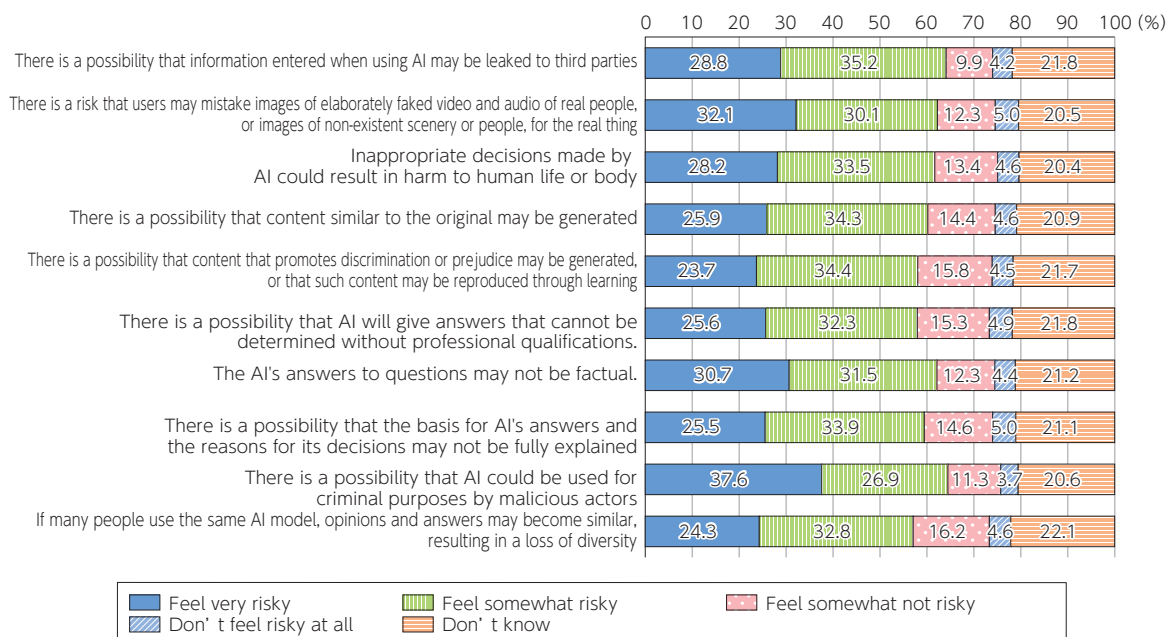


(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"

In a survey of people's awareness of the risks of using AI, the number of respondents who said that "I feel it is very risky" was relatively high for such reasons as crim-

inal use by malicious actors, being deceived by elaborate fakes, and the possibility that AI's answers to questions may not be factual (Figure 1-1-2-11).

Figure 1-1-2-11 Perspective on the risks of AI use



(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"



Figure (related data) Intention to use generative AI and AI (by country)

Source: MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00041>
(Data collection)



Figure (related data) Perspective on the risks of AI use (by country)

Source: MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00042>
(Data collection)

(2) Current status of AI use among companies

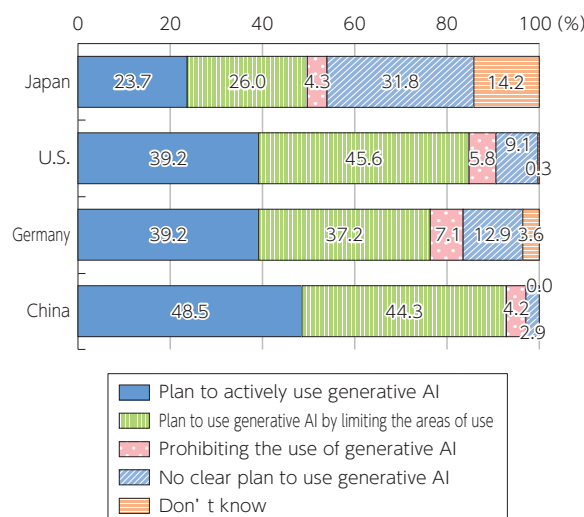
Based on a survey conducted in four countries, namely Japan, the U.S., Germany, and China, the current status of AI use in companies is summarized.

Respondents were asked about the policy for using generative AI at their companies, the percentage of companies in Japan that formulate a policy of "positively using generative AI" or "limiting domains for using generative AI" was 49.7% in the FY 2024 survey, an increase from the FY2023 survey (42.7%). On the other hand, compared with other countries surveyed this time, Ja-

pan continues to show a lower tendency to use generative AI than other countries (**Figure 1-1-2-12**).

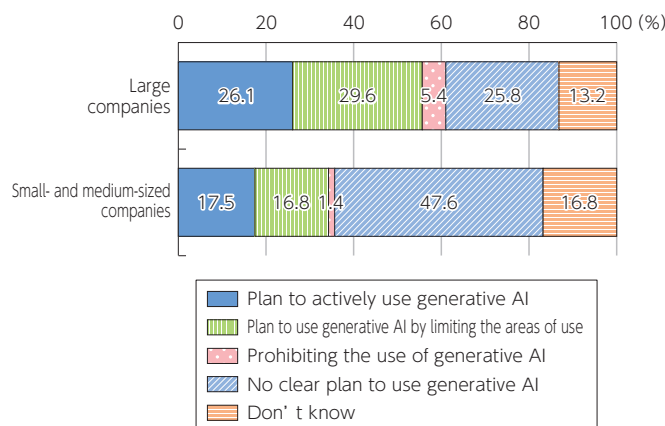
In addition, when looking at the situation in Japan by company size, the majority of small and medium-sized companies responded that they have "not clearly formulated a policy for using generative AI," accounting for about half of the total. The survey indicates that Japanese small and medium-sized companies are lagging behind large companies in deciding on a policy of using generative AI (**Figure 1-1-2-13**).

Figure 1-1-2-12 Status of policy formulation for using generative AI (by country)



(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"

Figure 1-1-2-13 Status of policy formulation for using generative AI (by company size (Japan))

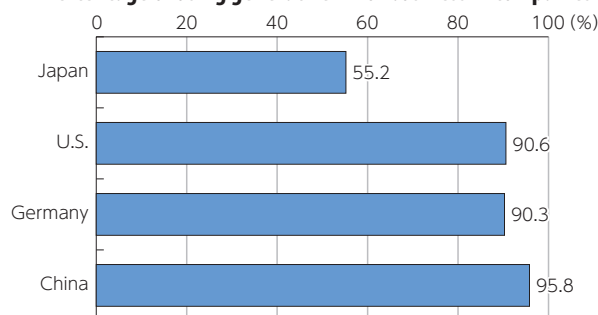


(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"

Furthermore, when asked about the current status of using generative AI for business areas where it is expected to be used, the percentage of respondents in Japan who answered that they are using generative AI for some kind of business was 55.2% (the percentage who answered “currently using generative AI for business”)

(Figure 1-1-2-14). For example, regarding individual tasks, 47.3% of respondents in Japan (those who answered “currently using generative AI for business”) said they use generative AI to “assist with emails, minutes, document preparation, etc.”³⁴ Both percentages are low compared with other countries.

Figure 1-1-2-14 Percentage of using generative AI for business in companies (by country)³⁵



(Source) MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”



Figure (related data) Percentage of using generative AI for business in companies (by business, by country)

Source: MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00046>

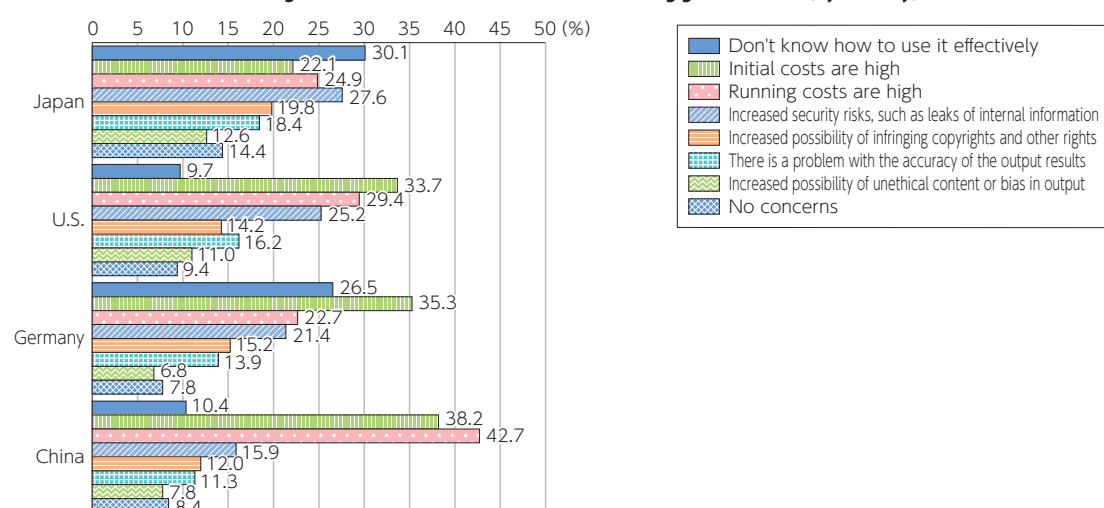
(Data collection)

When respondents were asked about concerns about introducing generative AI, the most common answer in Japan was “I don’t know how to use it effectively,” followed by “security risks such as leaks of internal information,” “high running costs,” and “high initial costs” (Figure 1-1-2-15).

When respondents were asked about their thoughts on the impact that promoting the use of generative AI will have on their company, the most common answer in

Japan was that it will “improve business efficiency and alleviate labor shortage.” In the other three countries, respondents tend to cite business expansion, acquiring new customers, and new innovations. Overall, all four countries appear to be focusing on the positive aspects of generative AI, such as increased operational efficiency and business expansion, rather than the negative aspects, such as increased security risks (Figure 1-1-2-16).

Figure 1-1-2-15 Concerns about introducing generative AI (by country)

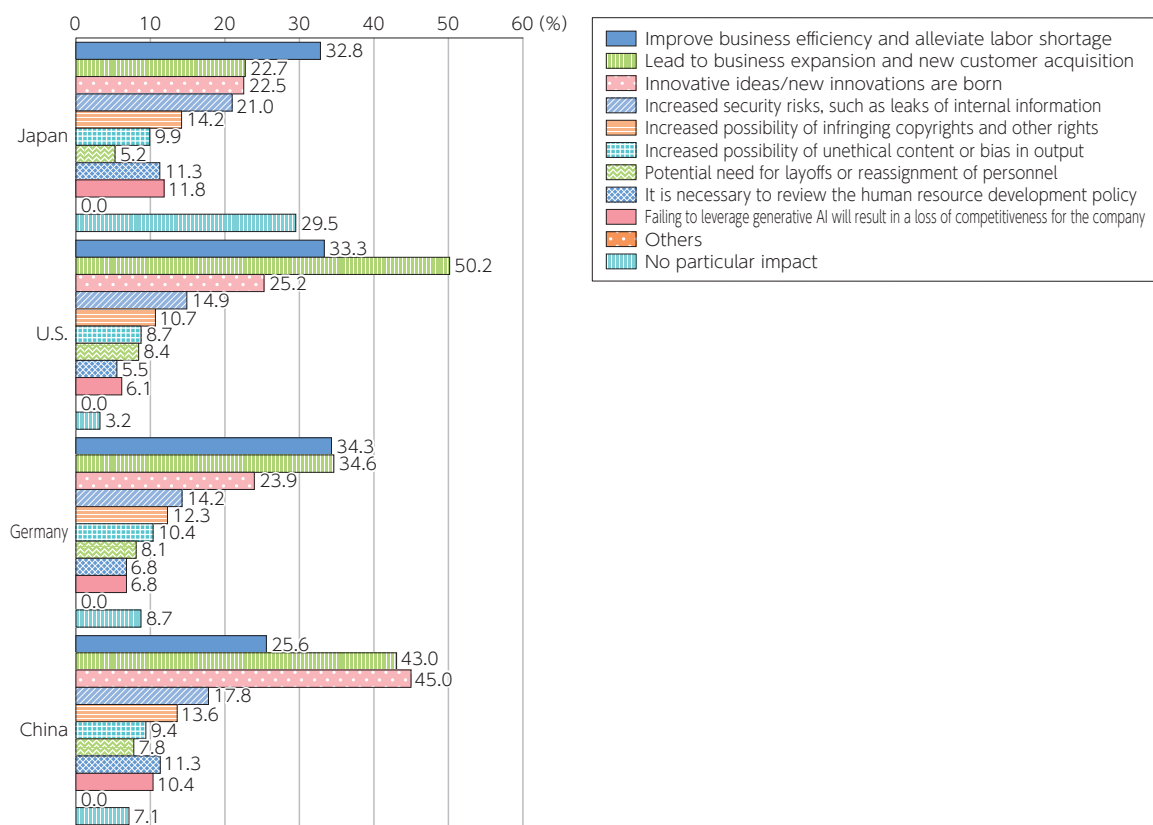


(Source) MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

³⁴ Regarding the percentage of using generative AI for each individual task within a company, as the estimation method used for the FY2024 survey was changed from that of the FY2023 survey to improve estimation accuracy, a simple comparison between the FY2024 survey and the FY2023 survey is not possible.

³⁵ Estimated based on the percentage of respondents who know their company’s policy of using AI and answered that they use generative AI for some kind of business.

Figure 1-1-2-16 Effects and impacts of using generative AI (by country)



(Source) MIC (2025) "Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries"

Section 3 Foreign Business Operators' Rise in the Digital Field and the Relevant Current Situation in Japan

Overseas platform operators have grown significantly by taking advantage of the characteristics that are easily manifested in digital markets, the data they collect, and the enormous profits, and they have a strong presence in Japan as well. They have expanded from their traditional business fields into other digital fields, and recently their influence has expanded to include physical infrastructure such as submarine cables and power plants.

On the other hand, the share of Japanese companies in the global digital market remains low overall, and the deficit in the balance of international payments in the digital field is on the rise due to factors such as the increasing use of digital technologies in social life and cor-

porate activities in Japan and the low international competitiveness of Japan's digital industry.

At present, using the excellent digital services available on the market has positive aspects, such as accelerating digitalization. However, if Japan's international competitiveness in the digital field remains low and its dependence on foreign business operators in key digital fields continues to grow, it is pointed out that there are concerns that Japan will lose the opportunity to incorporate the benefits of the rapidly growing digital field into its economic growth, as well as concerns from the perspective of economic security and other aspects.

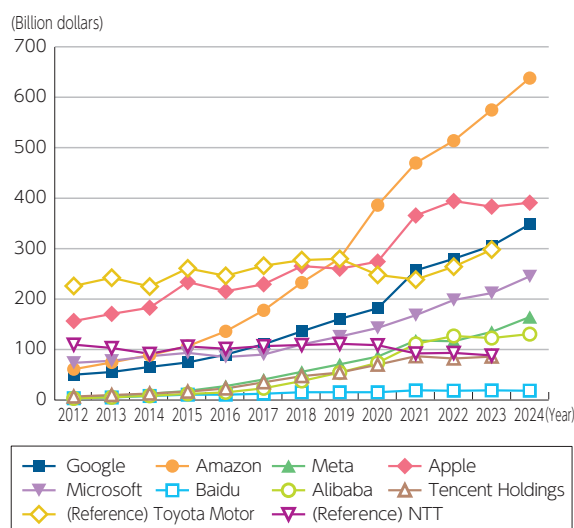
1. Rise of Overseas Big Tech Companies

(1) Growth of platform operators and its background

Big tech companies, including overseas digital platform operators, have a great presence in providing SNS, cloud services, and other services that are forming the new digital infrastructure of society. These overseas businesses have grown rapidly by taking advantage of various characteristics that are easily manifested in the

digital market, as well as the data they collect and the enormous profits. For example, digital platform operators, primarily Google, Apple, Facebook (Meta), Amazon, and Microsoft, have grown to boast world-class levels of both sales and market capitalization (Figure 1-1-3-1)¹.

Figure 1-1-3-1 Trends in sales of foreign platform operators



(Source) Prepared from Statista data and the financial information of each company

The rise of giant digital platform operators is driven by characteristics that can be explained by various economic concepts, such as the “network effect,” where the value of a service increases as the number of users increases; the “low marginal cost” of providing additional services in comparison to huge fixed costs and the resulting “economies of scale;” and the “lock-in effect,” where users find it difficult to switch from a familiar ser-

vice to another service. These characteristics are not inherent to digital goods alone, but they are more likely to manifest in the digital market, and the market structure makes it easier for businesses that take the lead in the market by using mechanisms that effectively utilize these characteristics to establish an overwhelming competitive advantage.

¹ For the top 15 companies by market capitalization in the global ICT market, see “Market trends” in Section 6 (1), Chapter 1, Part II

(2) Growing influence of big tech companies across fields

Big tech companies are expanding their influence across all layers of the digital industry through technological innovation and market expansion, operating across multiple fields. These companies initially started out by providing applications and services for users, and have gradually expanded and become more involved in the physical infrastructure layer. Today, big tech companies are strengthening their influence across many areas, from digital industries such as cloud services, data

centers, and communications infrastructure to power infrastructure, and are also taking the lead in new technological innovations such as generative AI.

Here, the approaches of big tech companies to the network infrastructure layer, energy supply layer, and generative AI, which are areas where new movements by such companies have been particularly significant in recent years, will be discussed.

A Network infrastructure layer

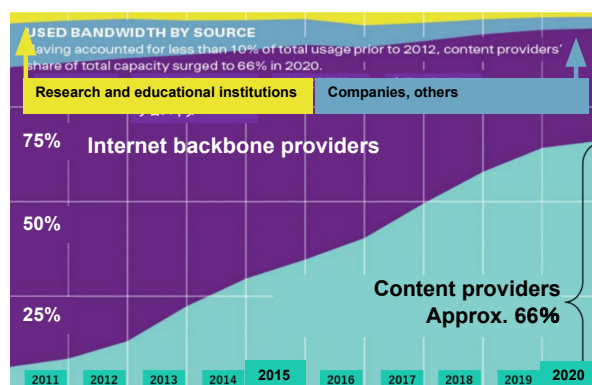
Big tech companies have begun investing in communications infrastructure to improve the efficiency of data transmission, etc. Particularly noteworthy is the investment in submarine cables. In order to improve the efficiency of its communications infrastructure and reduce costs, Google laid its own submarine cables and established a high-speed communications network between its data centers. Meta, Microsoft, and Amazon are also participating in the construction of submarine cables². This allows big tech companies to boost intercontinental data transfer speeds, improve the quality of their services and strengthen their influence in the communications infrastructure market.

Until the early 2010s, the laying and use of submarine

cables was dominated by telecommunications carriers (Internet backbone providers), and in 2011, content providers³ accounted for less than 10% of the submarine cable bandwidth use. However, since the late 2010s, big tech companies such as Google, Meta, Microsoft, and Amazon have expanded their installation and use of submarine cables, and in 2020, content providers accounted for nearly 70% of the submarine cable bandwidth use (Figure 1-1-3-2).

With submarine cables carrying 99% of international communications, big tech companies are exerting a major presence in submarine cable investment, changing the traditional telecommunications carrier-led market structure.

Figure 1-1-3-2 Changes in submarine cable bandwidth use



(Source) Prepared based on TeleGeography "A Complete List of Content Providers' Submarine Cable Holdings"

B Energy supply layer

Operating a data center requires a huge amount of electricity, and a stable power supply is essential for the business of big tech companies. As demand for generative AI increases in the future, it is expected that demand for electricity will also increase. With the aim of increasing the stability and cost-effectiveness of energy sup-

plies and the use of renewable energy, some big tech companies are stepping up their involvement through contracts and investments in power plants. For example, Google signed contracts for solar power plants being developed at over 800 locations across Japan⁴.

C Leading the field of generative AI

Big tech companies are leveraging their enormous fi-

nancial resources, advanced technological development

² DIAMOND Online "Major telecommunications companies fall, Google and Facebook take center stage, shifting the driving force behind submarine cable laying" (October 5, 2022) (<https://diamond.jp/articles/-/310530>)

³ "Content providers" here refers to networks known as hyperscalers, over-the-top providers, Internet content providers, cloud service providers, etc., including Internet-based content and platform providers (e.g., Google, Meta, Microsoft, Apple), cloud service/platform providers (e.g., Amazon, Microsoft, Oracle, Alibaba, Google), and content delivery networks (CDNs) (e.g., Akamai, CloudFlare).

⁴ MIC/METI Expert Group Meetings on Development of Digital Infrastructures (e.g., DCs) (7th) materials "The environment and challenges surrounding Japan's digital infrastructure" (May 30, 2024) (https://www.meti.go.jp/policy/mono_info_service/joho/conference/digital_infrastructure/0007/007_widejp.pdf)

capabilities, world-class human resources, and the vast amounts of data they accumulate every day to establish an overwhelming lead in the field of generative AI and maintain competitiveness. This competitiveness is supported by the multi-layered foundations that these companies have built, creating advantages that cannot be easily emulated.

Regarding the status of LLM development by big tech companies and the social implementation of generative AI, for example, Microsoft collaborates with OpenAI to develop “Copilot” and is working to integrate generative AI into business tools⁵. Meta also makes “Llama,” an LLM developed by the company, publicly available, creating an ecosystem that can be used by many companies⁶. Through these efforts, big tech companies have comprehensive influence over everything from applica-

tions to models and infrastructure (computing resources, data, and specialized human resources), and are driving the evolution and social implementation of generative AI technology.

Although U.S. big tech companies still occupy a major position at each layer, in recent years leading companies around the world, including those in China, have also been focusing on AI business.⁷

In this way, overseas big tech companies have come to exert influence in a wide range of areas, from the foundations of the digital industry to cutting-edge technology. As a result, this movement is bringing about major changes to the traditional industrial structure and having a significant impact on existing telecommunications companies, energy companies, and even startups developing AI.

2. Presence of Foreign Business Operators in the Digital Market and the Current State of Japan's Competitiveness

While overseas big tech companies, including overseas platform operators, have grown significantly and are exerting a major presence in many digital markets around the world, including Japan, the presence and international competitiveness of Japan's digital industry in the global market cannot be said to be strong in many

areas. This section presents the current competitiveness of Japan's digital industry as suggested by the share of Japanese companies in the domestic and global digital markets, balance of payments statistics (balance of payments for services) and trade statistics related to the digital field.

(1) Trends in the share of Japanese companies in the global and domestic digital markets

Foreign business operators have a significant presence in digital services, equipment, and devices, which

play an important role in today's digital society.

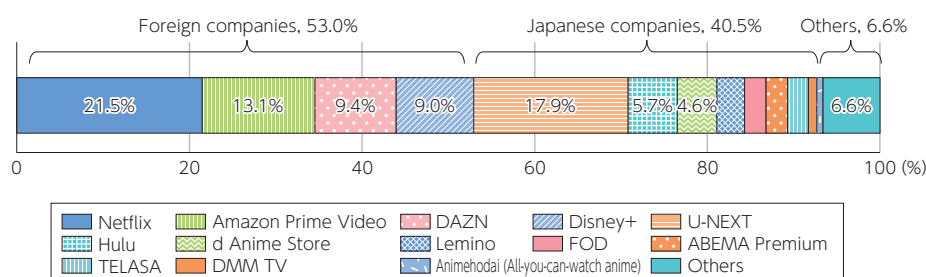
A Domestic market share and trends

Regarding cloud services, in the IaaS and PaaS market in Japan, three companies - Amazon Web Services, Microsoft, and Google - are significantly expanding their market share. Furthermore, Netflix had the highest market share of 21.5% in Japan for subscription video streaming market in 2024, with foreign companies accounting for more than half of the domestic market share (**Figure 1-1-3-5**).

In terms of video sharing services and SNS in Japan, the usage rate of YouTube exceeded 80% in 2024, and usage rates of foreign business operators' services such as X, Instagram, and TikTok are increasing year by year⁸.

When it comes to digital devices, for example, foreign business operators accounted for a large proportion of the Japanese smartphone market share in 2024, with 59% for Apple, followed by 10% for Google (**Figure 1-1-3-6**).

Figure 1-1-3-5 Japanese market share by subscription video streaming service (2024)



(Source) Prepared from GEM Partners Inc. materials⁹

⁵ NIKKEI FT the World “U.S. Microsoft and Google’s rising AI costs alarm investors” (February 5, 2024) (<https://www.nikkei.com/prime/ft/article/DGXZQOCB0229Z0S4A200C2000000>)

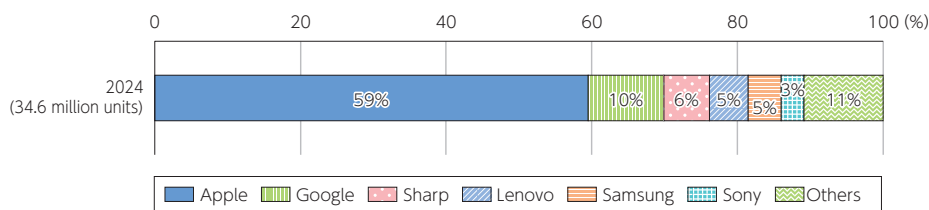
⁶ METI Commerce and Information Policy Bureau “Towards the realization of a digital society” (October 2024) (https://www.meti.go.jp/shingikai/sankoshin/shin_kijiku/pdf/024_04_00.pdf)

⁷ For other AI initiatives by platform operators in the U.S. and China, see “Trends of major platform operators” in Section 6 (2), Chapter 1, Part II

⁸ See Section 1, 1 (2) (3), Chapter 1, Part I

⁹ GEM Partners Inc. “Subscription video streaming market estimated to reach 526.2 billion yen in 2024, with U-NEXT seeing the largest share growth and closing in on Netflix, which has held the top spot for six consecutive years” <<https://www.gem-standard.com/columns/1023>>

Figure 1-1-3-6 Japanese smartphone market share (2024)



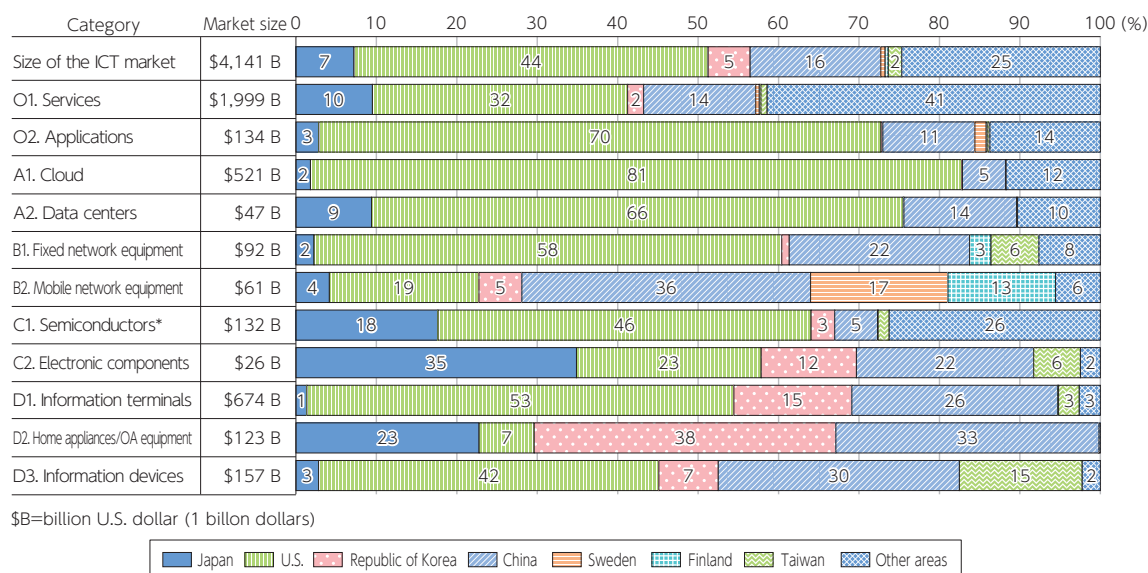
(Source) Omdia

B Global market share and trends

Looking at the sales-based share of Japanese companies in the global digital market ¹⁰by category, it is estimated that in 2023, with the exception of some categories such as semiconductors, electronic components, home appliances, and office equipment, their share generally remained around 10% or less (Figure 1-1-3-7). Looking at individual devices and services, Japanese

companies only had a single-digit share in the large global market for smartphones, PCs, and servers. Although Japanese companies' global share of mobile phone base stations overall is single digits, it accounts for 29% of the open vRAN¹¹ market alone (Figure 1-1-3-8).

Figure 1-1-3-7 Estimated share of the global ICT market by country and region (by category) (2023)



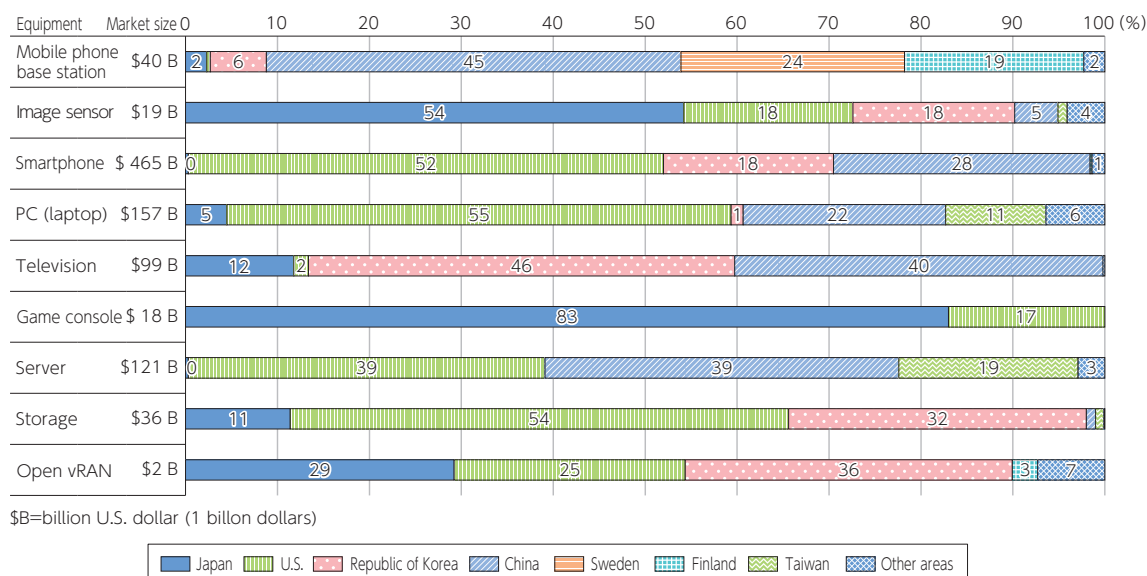
* Excludes semiconductors that can be used for AI applications (AI semiconductors), such as GPUs and MPUs, the latter of which are equipped with built-in AI accelerators.

(Source) Prepared from the MIC "International IoT Competitive Index"

¹⁰ Prepared from the MIC "International IoT Competitive Index" (2023) This share is based on data compiled by company headquarters location for approximately 1,700 companies worldwide. Note that due to limitations of the compiled data, it may not be possible to comprehensively calculate all companies. Due to rounding and the possibility that there may be companies that are not covered by this estimate, "0%" does not necessarily mean that there is no market share for the relevant country or region. It may mean a very small share in some cases.

¹¹ A standardized system that converts base station functions into software and allows devices and software from different manufacturers to be combined.

Figure 1-1-3-8 Estimated share of the global ICT market by country and region (by device) (2023)



(Source) Prepared from the MIC "International IoT Competitive Index"



Figure (related date) Estimated share of the global ICT market by country and region (by category) (comparison between 2018 and 2023)

Source: Prepared from the MIC "International IoT Competitive Index"
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00057>
 (Data collection)



Figure (related date) Estimated share of the global ICT market by country and region (by device) (comparison between 2013 and 2023)

Source: Prepared from the MIC "International IoT Competitive Index"
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00058>
 (Data collection)

(2) Trends in the balance of services of digital-related items

Regarding the services account in the balance of payments statistics, the Bank of Japan Review titled "Globalization of Services Trade as Seen in Balance of Payments Statistics"¹² examines changes in the balance of payments for items classified as digital-related, including (1) computer services; (2) copyright royalties; (3) professional and business consulting services; (4) communications services; and (5) information services (hereinafter referred to as "digital-related items"). Looking at the balance of payments for items (1) to (3), in particular, the deficit has been increasing rapidly in recent years, attracting attention as the so-called "digital deficit."¹³ It should be noted that this includes balance of payments related to services other than the digital

field¹⁴.

For example, in 2024, the total balance of payments of (1) computer services, (2) copyright royalties, and (3) professional and business consulting services was in the red by approximately 6.7 trillion yen (an increase of approximately 0.9 trillion yen from the previous year) (if (4) communications services and (5) information services are added to this, the deficit would have been approximately 6.8 trillion yen (an increase of approximately 0.9 trillion yen from the previous year))¹⁵. Compared with 2014, the deficit for "copyright royalties" increased by approximately 2.1 times, "computer services" by approximately 3.3 times, and "professional and business consulting services" by approximately 5.4 times in

¹² Bank of Japan "Bank of Japan Review 'Globalization of Services Trade as Seen in Balance of Payments Statistics'" (August 2023) <https://www.boj.or.jp/research/wps_rev/rev_2023/data/rev23j09.pdf>

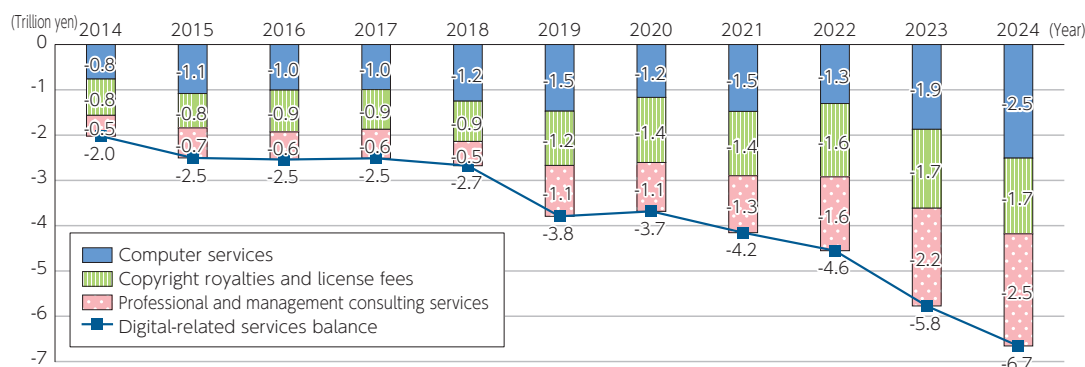
¹³ In some cases, communication services and information services are also included and classified as the so-called "digital deficit."

¹⁴ Computer services include service transactions such as contract software development, computerized information processing, and hardware consulting, maintenance, and repair, as well as license fees when end users acquire general-purpose software such as games online, and the purchase and sale fees for software copyrights. Copyright royalties include license fees for the reproduction and distribution (sale, free distribution, etc.) of copyrighted works (computer software, music, video, characters, literature, academic works, art, etc.). Professional and business consulting services include service transactions related to legal, accounting and management consulting, public relations, advertising and market research. For details of services included in each item, see "Exports and imports in the ICT field" in Section 1 (4), Chapter 1, Part II

¹⁵ For changes in the balance of payments for "digital-related items" when communication services and information services are included, see "Exports and imports in the ICT field" in Section 1 (4), Chapter 1, Part II

2024^{16,17} (Figure 1-1-3-9).

Figure 1-1-3-9 Changes in the ¹⁸digital-related services balance



* The total balance of payments of computer services, copyright royalties, and professional and business consulting services

(Source) Prepared from "Balance of Payments Statistics" by the Ministry of Finance

(3) Trends in trade statistics for ICT goods

Based on trade statistics from the Ministry of Finance, the difference between the amount of ICT goods^{19,20} exported from Japan and the amount of ICT goods imported²¹ into Japan shows that the deficit has been increasing in recent years, reaching a deficit of approximately 3.4 trillion yen in 2024²². Looking at the breakdown by item, the largest surplus in 2024 was recorded in "other electronic components," followed by "integrated cir-

cuits." On the other hand, the largest deficit was recorded in "mobile phones," and the deficit has been expanding in recent years. The largest deficits were followed by "personal computers," "electronic computer units (excluding personal computers)," and "wired telecommunications equipment." Parts and materials tend to have larger surpluses, while final products tend to have larger deficits.

¹⁶ As background to the increase in the deficit for "digital-related items," for example, the Cabinet Office's "Annual Report on the Japanese Economy and Public Finance FY2024" (August 2024) states that the domestic market size for cloud services, internet advertising, and video streaming has expanded significantly, and points out that an estimate of overseas payments for cloud services shows that the pace of increase has accelerated in recent years, which is thought to explain much of the increase in payments for "computer services." It also points out that much of the increase in the deficit in the "professional and business consulting services" field can be explained by the increase in overseas payments related to Internet advertising in recent years, and that when the deficit for "copyright royalties" is compared with the difference between domestic content-related payments and sales by domestic companies, the increasing trend is similar, although at different levels.

¹⁷ Regarding Japan's overall balance of payments and digital-related balance, the Ministry of Finance's "Issues of Japan's economy and prescriptions for them from the perspective of international balance of payments" panel report (July 2, 2024) states, "Japan's current account balance records a stable surplus, with the surplus in FY2023 being the largest ever," and "Japan's net external assets reaches a record high of 471 trillion yen at the end of 2023, making it the world's largest net asset nation for the 33rd consecutive year." It states, "Looking at each item, only the primary income balance is recording a surplus, while the trade balance is in deficit and the deficit in cutting-edge field such as the digital field is widening in the services balance." It also states, "Forecasts by major think tanks indicate that the current account surplus will shrink or even turn into a deficit as the declining birthrate and aging population continue to progress."

¹⁸ This is sometimes discussed under the terms "digital deficit" or "digital-related balance," but here it is referred to as the "digital-related services balance" in order to distinguish it from trade in ICT goods, which will be explained below.

¹⁹ The following goods are included in the scope of ICT goods in the MIC's "Infor-communications Industry Input-Output Table."

Personal computers, electronic computer units (excluding personal computers), electronic computer accessories, wired telecommunications equipment, mobile phones, wireless telecommunications equipment (excluding mobile phones), communication cables and optical fiber cables, office machines, semiconductor elements, integrated circuits, liquid crystal panels, flat panels and electron tubes, and other electronic components

²⁰ The scope of ICT goods here is different from the "digital-related goods" compiled by the Japan External Trade Organization (JETRO) in its "JETRO Global Trade and Investment Report." For example, "semiconductor manufacturing equipment," which is included in "digital-related goods" in the "JETRO Global Trade and Investment Report," is not included in the ICT goods here.

²¹ The import value in trade statistics is based on CIF (Cost, Insurance and Freight, which includes the price of the cargo as well as insurance and freight to the destination), and the export value is based on FOB (Free on Board, which is the shipping price in the exporting country. It does not include insurance and freight to the destination after shipping). The difference between the export value and the import value here is calculated mechanically.

²² It is important to note that these statistics only show the amount of exports from Japan to overseas countries and the amount of imports from overseas countries to Japan, and do not reflect exports from Japanese companies' overseas production bases to countries other than Japan, and that when products produced by Japanese companies at their overseas bases are imported into Japan, it is counted as an "import."

Section 4 Changes in the World Situation, Natural Environment, and Society, and the Outlook for the Future Digital Society

In recent years, the world situation has been undergoing major changes, including rising geopolitical tensions and economic instability, and it is said that the outlook is becoming increasingly uncertain and opaque.

For example, according to an index assessed by the United Nations based on factors such as the number of newspaper articles relating to geopolitical risks and uncertainty in global economic policies, geopolitical risks have risen significantly in recent years, triggered by the war in Ukraine and the worsening situation in Gaza. In addition, the index of uncertainty regarding global economic policies has also risen significantly due to the global spread of COVID-19 and the war in Ukraine, and both indices remain at high levels (**Figure 1-1-4-1**). These geopolitical risks and uncertainty in the global economy are likely to remain high. In fact, the number of armed conflicts occurring around the world is increasing, and there are concerns that tensions may continue to rise (**Figure 1-1-4-2**).

In addition, the natural environment is continuing to change, with an increase in the occurrence of abnormal weather and the severity of disasters due to global warming, and there are concerns that torrential rain disasters will become more severe, with the number of heavy rain events occurring each year on the rise. Furthermore, with regard to earthquakes in Japan, there is concern that there is an approximately 80% chance of an M8 to M9 earthquake occurring within the next 30 years, particularly along the Nankai Trough (as of March 15, 2025)¹. In addition, if an earthquake were to occur directly beneath the capital, the risk of earthquake damage becoming more severe as urbanization progresses is increasing.

Moreover, Japan is facing a labor shortage caused by a declining birthrate and aging population, which is becoming more serious every year, with the impact being particularly pronounced in rural areas. Furthermore, compared with the global economic growth, the Japanese economy continues to stagnate. For example, with regard to population changes, the declining birthrate

and aging population are progressing in Japan, and the aging rate, which is the proportion of the population aged 65 and above to the total population, is increasing. At the same time, the proportion of people aged 65 and above to the working-age population is also increasing. This impact is expected to be particularly pronounced in rural areas, and the growing concentration of population in urban areas is expected to worsen further in the future. On the economic front, the Japanese economy has been in a long-term slump since the collapse of the bubble economy in the early 1990s, with a low economic growth rate and sluggish labor productivity. According to OECD data, Japan's hourly labor productivity has been at a low level among OECD member countries for a long period of time.

In the future, as digital technologies advance and digital services become more sophisticated and widespread, the digital field, which plays the role as social infrastructure, is expected to expand further. Furthermore, as digital technologies such as AI and robots advance and become more widely used in society, it is expected that they will help solve and alleviate social issues in Japan, which is facing a declining birthrate, aging population, and population decline.

On the other hand, as digital technology becomes increasingly prevalent in socio-economic activities and its presence as a part of social infrastructure grows, there is a growing risk that its negative impacts will become even greater. In addition, as AI becomes more advanced and some predict it may eventually reach a level known as Artificial General Intelligence (AGI)^{2,3}, there is a concern that the risks associated with digital technologies, including AI, may increase even further.

While promoting further technological development and its utilization to ensure that the benefits of advancing digital technologies can be fully enjoyed in social life and corporate activities, it is also important to continue taking measures to address threats that may expand as digital technology and its use progress.

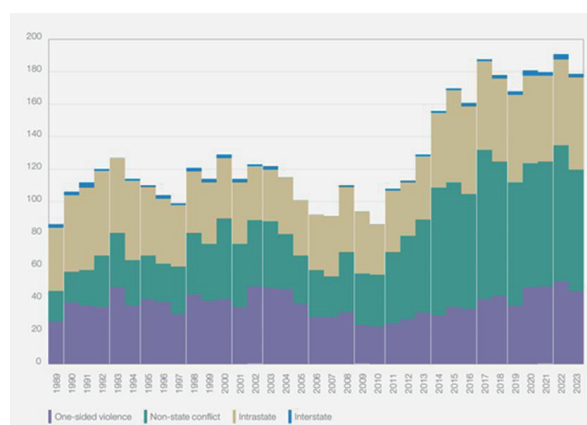
¹ Headquarters for Earthquake Research Promotion "Earthquakes occurring along the Nankai Trough" <https://www.jishin.go.jp/regional_seismicity/rs_kaiko/k_nankai/> (Reference March 15, 2025)

² For example, in July 2024, OpenAI was reported to have released a five-stage roadmap showing progress toward realizing Artificial General Intelligence (AGI). OpenAI CEO Sam Altman reportedly estimates that AI will reach Level 5 within the next decade or so.

³ Bloomberg (2024/7/11) "OpenAI Develops System to Track Progress Toward Human-Level AI"

Figure 1-1-4-1 Changes in global economic policy uncertainty and geopolitical risks

(Source) United Nations "World Economic Situation and Prospects 2025"⁴

Figure 1-1-4-2 Secular changes in the number of armed conflicts in the post-Cold War world

(Source) WORLD ECONOMIC FORUM "Global Risks Report 2025"

**Figure (related data) Working-age population and elderly population by prefecture in 2050**

Source: Cabinet Secretariat "Council for Creating New Regional Economies and Living Environments (2nd Meeting)" Document 1

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00066>

(Data collection)

**Figure (related data) Changes in the ranking of labor productivity on a per-hour basis in major countries (OECD member countries)**

Source: Prepared from "OECD Data Explorer"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00067>

(Data collection)

**Figure (related data) OpenAI's roadmap for AGI evolution**

Source: Bloomberg (2024/7/11) Prepared from "OpenAI Develops System to Track Progress Toward Human-Level AI"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00068>

(Data collection)

⁴ United Nations "World Economic Situation and Prospects 2025" < <https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-2025/> >

Chapter 2

Challenges Brought about by Advancing Digital Technologies

As outlined in Chapter 1, as digital technology becomes increasingly prevalent in socio-economic activities and its presence as a part of social infrastructure grows, there is a growing risk that its negative impacts will become even greater.

For example, as the use of advancing digital technologies such as AI progresses, there is a need to secure a digital infrastructure that can respond to increasing demand for communications, computing resources, and electricity. However, against the backdrop of the current increasingly unstable global situation and intensifying disasters, there is a risk that the use and access of important digital infrastructure will become more difficult, and that security will be compromised, which could increase in the future. In addition, several risks are expected to become more serious. These include: the risks

posed by the advancement of AI; problems related to dis-/mis-information on the Internet, including social media platforms that are becoming increasingly important as a basis for information gathering and communication; and cybersecurity threats, which are intensifying due to both the destabilization of the global situation and the advancement of AI. Addressing these challenges in the digital field is essential to fully enjoy the benefits of advancing digital technologies while minimizing their risks.

This chapter provides an overview of the major challenges facing the digital field, brought about by the advancement of digital technologies and their growing influence as social infrastructure, coupled with the current global situation, changes in the natural environment, and society¹.

Section 1 Securing a Reliable Digital Infrastructure that Supports a Digital Society

In Japan, where the population is aging and the economy continues to stagnate, there is a need to use advancing digital technologies, including AI, to advance solutions to social issues. With the growing use of digital technologies and the expansion of the digital ecosystem as a foundation of society, there is an increasing need to develop digital infrastructure capable of supporting a digital society and responding to rising demand for communications, computing resources, electricity, and disaster risks. Furthermore, given the current destabilizing global situation and the increasing dependence on

overseas countries in the digital field, concerns have been raised about excessive dependence on overseas countries from the perspective of maintaining stable economic and social activities and ensuring security.

From this perspective, it is becoming increasingly important to secure a strong digital infrastructure for supporting a digital society in response to the further increase in demand for communications due to advances in digital technologies such as AI, and to ensure and improve Japan's autonomy by improving its international competitiveness in the digital field.

1. Overview of key challenges

As digital technologies are used to solve social issues in Japan and the digital ecosystem expands as social infrastructure, there is a growing need to develop a digital infrastructure to support a digital society in response to increasing demand for communications, computing resources, electricity, etc., as well as disaster risks.

For example, data centers have become one of the most important digital infrastructures that support today's digital society, and securing data centers within Japan has become an important issue. However, the location of domestic data centers and new investments are concentrated in the Kanto and Kansai regions, and as of 2023, approximately 90% (in terms of area) of data cen-

ters across Japan are located in the Kanto and Kansai regions. On the other hand, from the perspective of wide-area disaster prevention, it is important to ensure that backup databases are geographically dispersed.

Furthermore, while submarine cables are an important digital infrastructure for transporting large volumes of international communication traffic, submarine cable landing stations are concentrated in a few locations, such as the Boso Peninsula in Chiba Prefecture and the Shima Peninsula in Mie Prefecture, and there is a need for regional decentralization and multiple routes, similarly to data centers.

Moreover, for the advancement of AI use in various

¹ Note that this chapter does not comprehensively describe the content and responses to each challenge, but rather provides examples to promote understanding of individual issues, and the challenges are not limited to those described here. Refer also to Chapter 2 of Part II for the MIC's related policies regarding individual challenges.

fields and future services, there is a need for computing capabilities to process large amounts of data. Demand for the infrastructure necessary for the development and use of generative AI is expanding significantly worldwide². In order to maintain and strengthen competitiveness in various industries, it is essential to secure further computing capabilities, and securing computing resources in Japan is an important challenge.

In addition, concerns are growing about the increasing amount of electricity consumed in the ICT sector, including networks and data centers, as a new challenge arising from the expansion of generative AI and communication traffic. For example, the Japan Science and Technology Agency (JST) forecasts the amount of power consumed by data center networks depending on the level of improvement in energy efficiency, and predicts

that if current technologies remain unchanged and no energy-saving measures are implemented, power consumption will increase significantly in the future.

Additionally, as discussed in Chapter 1, foreign businesses operators hold a large share of many digital markets today. It is not realistic to expect all digital services and infrastructure to be provided by business operators with business bases in Japan. However, in light of the instability of the current global situation and Japan's national and economic security, it is becoming increasingly important to ensure a stable and secure supply chain network through collaboration with trustworthy domestic and foreign business operators, as well as to ensure and enhance Japan's autonomy, particularly when it comes to important digital services and infrastructure.

2. Direction of response

(1) Securing a strong digital infrastructure for supporting a digital society

Advances in technologies such as AI are expected to further increase demand for communications. In order to minimize the impact of unforeseen events such as disasters on our social lives, which depend on digital infrastructure, it will be important to take steps to ensure

that digital infrastructure can respond to the sudden increase in demand for computing resources, communications, and electricity, and is easy to access, resilient, and redundant³.

A Regional decentralization of data centers and submarine cables

Regarding the regional decentralization of data centers and submarine cables, the MIC has established a “Digital infrastructure development fund” under the FY2021 supplementary budget “Digital infrastructure resilience project through regional decentralization of data centers, submarine cables, etc.” in order to support the development of data centers and submarine cables, etc., and promote “decentralization of data centers concentrated in the Tokyo area, etc.,” “construction of submarine cables circling Japan,” and “Project for Strengthening Digital Infrastructure through Multi-Routing of International Submarine Cables.” The fund is providing support to private businesses that locate data centers, submarine cables, etc. in regional areas.

Moreover, the “Meetings of the Expert Group on the Development of Digital Infrastructures (Data Centers (DCs), etc.)” hosted by the MIC and the METI compiled

the “Interim Report 3.0” in September 2024. In addition to continuing to promote the decentralization of data centers, the report recommended promoting the decentralization of landing stations for international submarine cables, with an eye toward international cooperation on all photonics network, in order to develop digital infrastructure that will support the AI society of the 2030s. Since March 2025, the MIC and the METI have been examining the development of data centers, primarily from the perspective of electricity and communications infrastructure, with the aim of accelerating digital transformation through the use of AI and simultaneously achieving growth and decarbonization. They have also been holding the “Summary 1.0 of Public-Private Advisory Council on Watt-Bit Collaboration” to promote collaboration and cooperation between public and private sector stakeholders.



Figure (related data) “Vision for Japan’s digital infrastructure in the 2030s” (from the overview of MIC/METI “Expert Group Meetings on Development of Digital Infrastructures (eg, DCs) Interim Report 3.0”)

Source: MIC/METI “Expert Group Meetings on Development of Digital Infrastructures (eg, DCs) Interim Report 3.0”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00072>

(Data collection)

² For example, according to the METI’s “1st Industrial Structure Council Commerce, Distribution and Information Committee Information Economy Subcommittee” (December 25, 2024) document (https://www.meti.go.jp/shingikai/sankoshin/shomu_ryutsu/next_generation_semiconductor/pdf/001_03_00.pdf), the outlook for demand for AI infrastructure is that demand for servers and storage alone in Japan in the single year of 2030 is expected to reach approximately 1 trillion yen, approximately three times the amount in 2023.

³ Taking into account the challenges and circumstances described here and with a view toward the end of FY2030, the MIC has formulated the “Digital Infrastructure Development Plan 2030” in June 2025 to clarify its policy on the development of essential digital infrastructure and specific promotion measures, thereby facilitating the integrated and efficient advancement of Japan’s digital infrastructure (see Chapter 2 of Part II for details).

B Utilization of NTN

NTN (Non-Terrestrial Network) efficiently covers areas where it is geographically and economically difficult to develop communications infrastructure, such as remote islands, oceans, and mountainous regions, enabling the provision of communications services in those areas. It can also function as a temporary means of communication when existing communications infrastructure is damaged by natural disasters, etc., and as such, it is attracting growing interest from both the public and private sectors, and its utilization is increasing. In fact, following the earthquake that occurred in the Noto region of Ishikawa Prefecture in January 2024, the U.S. company SpaceX's satellite communications system "Starlink" was widely used to ensure emergency restoration of communications infrastructure and communications environments in evacuation centers and other locations.

Telecommunications carriers are actively promoting the use of NTN, and in addition to providing high-speed, high-capacity satellite communications services using low-orbit satellites, they are also working on developing solutions businesses that utilize satellites and drones, and on developing technology to realize HAPS⁴. Fur-

thermore, in April 2025, KDDI and Okinawa Cellular Telephone Company began offering "au Starlink Direct," a service that uses Starlink to enable smartphones to communicate directly with satellites (satellite direct communication), making communication possible even in areas outside mobile phone coverage as long as the sky is visible.

Taking these trends into consideration, the MIC is conducting research and development on the establishment of the systems necessary for the domestic introduction of HAPS through technological demonstrations and on increasing the speed and capacity of HAPS communications, based on the "Strategy for Realizing Next-Generation Information and Communication Infrastructure to Support AI Society - Beyond 5G Promotion Strategy 2.0" compiled in August 2024. In addition, with regard to satellite communications services, the MIC is supporting the development of technologies related to direct communications services between satellites and mobile phones, satellite optical communications, and the advancement of radio wave utilization, and is implementing the necessary institutional arrangements.

C Addressing decarbonization in digital infrastructure

As addressing global warming becomes an urgent issue, there is a need for power-saving and decarbonization in communication equipment, data centers, cloud services, AI use, etc.

Research and development is being conducted on various power-saving technologies and decarbonization promotion technologies as a technological response to the increasing power consumption in digital infrastructure such as data centers and communication infrastructure. One of such power-saving technologies is photonics-electronics convergence technology. Photonics-electronics convergence technology is a technology that combines circuits that handle electrical signals with circuits that handle optical signals, achieving low power consumption and low latency.

For example, in 2019, NTT launched the next-generation optical communications infrastructure concept "IOWN"⁵ and is conducting research into photonics-electronics convergence technology, drawing up a roadmap for applying photonics-electronics convergence technology to connections between data centers, connections between boards within data centers, and even

data transmission between or within semiconductor packages. Commercial use of IOWN 1.0 began in March 2023, and it is expected that data centers will be able to reduce their power consumption from FY2025.

The MIC is also conducting research and development aimed at the social implementation of all photonics network technology that utilizes photonics-electronics convergence technology, based on the "Strategy for Realizing Next-Generation Information and Communication Infrastructure to Support AI Society—Beyond 5G Promotion Strategy 2.0" (announced by the MIC in August 2024).

In addition, at the aforementioned "Summary 1.0 of Public-Private Advisory Council on Watt-Bit Collaboration," the MIC has been examining the development of data centers, primarily from the perspective of electricity and communications infrastructure, with the aim of accelerating digital transformation through the use of AI and simultaneously achieving growth and decarbonization to promote collaboration and cooperation between public and private sector stakeholders.

(2) Ensuring and enhancing Japan's autonomy in key digital fields

While the presence of foreign business operators is increasing in many important digital services and infrastructure, in light of the instability of the current global situation, it is becoming important to ensure a stable and secure supply chain network through collaboration with

trustworthy domestic and foreign business operators, as well as to ensure and enhance Japan's autonomy, particularly when it comes to important digital services and infrastructure.

⁴ Acronym of High Altitude Platform Station

⁵ Agency for Natural Resources and Energy, Advisory Committee for Natural Resources and Energy, Strategic Policy Committee (56th meeting) (June 6, 2024) Document 4 Hearing materials (Nippon Telegraph and Telephone Corporation) "The future of the electric power business from the perspective of the IOWN concept" < https://www.enecho.meti.go.jp/committee/council/basic_policy_subcommittee/2024/056/056_008.pdf > (Reference March 27, 2025)

A Measures to ensure stable supply under the Act on the Promotion of Ensuring National Security through Integrated Implementation of Economic Measures, etc.

The Act on the Promotion of Ensuring National Security through Integrated Implementation of Economic Measures⁶ aims to strengthen supply chains by designating as specified critical products those that are essential for the survival of the people or upon which the people's daily lives and economic activities depend widely, and by supporting private businesses and others working to ensure a stable supply of these materials. Programs used in systems that make computers (including input/output devices; the same applies hereinafter) available for information processing by others via the Internet or other advanced information and communications networks (hereinafter referred to as ⁷"cloud programs") are elements that determine the functionality of cloud services. In particular, from the perspective of

economic security and the balance of payments, it is important that fundamental cloud services, which are expected to expand into important areas such as corporate core systems, government services, and the control of social infrastructure, be provided by business operators with business bases in Japan. For this reason, cloud programs are designated as specified critical products, and plans to ensure a stable supply for efforts such as developing important technologies for highly competitive cloud services or introducing advanced computers required for basic cloud programs have been approved, and support for the plans' efforts has been provided. As of April 2025, a total of 11 plans for ensuring stable supply have been approved.

B Strengthening Japan's competitiveness in the digital field

Strengthening Japan's competitiveness in important digital infrastructures will contribute to enhancing Japan's autonomy in these digital infrastructures.

For example, Open RAN, an open radio access network that realizes interconnection among equipment and systems from different vendors, reduces supply chain risk by enabling the adoption of products from various vendors, enables the construction of flexible and scalable radio access networks, in addition to price optimization by revitalizing the base station market. It is also expected to contribute to the international expansion of Japanese telecommunications carriers and vendors by leveraging their strengths. In the overall base station market, Japan's share of the global market is only a few percent, but Open RAN is an area in which Japan has a relatively high share ⁸and is expected to grow in the fu-

ture.

As a policy response to open RAN, the MIC is taking into account the "Strategy for Realizing Next-Generation Information and Communication Infrastructure to Support AI Society—Beyond 5G Promotion Strategy 2.0 -" compiled in August 2024 and the "Comprehensive Strategy for Digital Overseas Promotion 2030" formulated in June 2025. The ministry is implementing measures such as enhancing the interconnection and operational test environment for base station equipment using open standards, conducting research and development on improving the efficiency of RAN control using AI, and supporting the overseas expansion of Open RAN through the "Overseas Expansion Support Project for Digital Infrastructure Ensuring Safety and Reliability."

⁶ Act on the Promotion of Ensuring National Security through Integrated Implementation of Economic Measures (Act No. 43 of 2022)

⁷ Cloud programs are divided into application software for realizing individual functions and software (basic cloud programs) for realizing functions commonly required to run applications.

⁸ Refer to "Global market share and trends" in Section 3, 2 (1) (i), Chapter 1, Part I

Section 2 New Challenges Accompanying the Advancement of AI

While being likely to bring convenience to our social and economic lives, AI may have a wide range of risks. When it comes to technological innovation surrounding AI, it is important to simultaneously promote innovation and address risks.

In addition, Japan is lagging behind the world's advanced AI countries in terms of technology, industry, and usage. If this trend continues, there is a risk that

Japan will fall behind in the various economic and social changes that will be driven by AI. In order to promote Japan's economic growth and utilization in the socio-economic domain, as well as from the perspective of economic security, there is an increasing need for efforts to promote AI-related innovation, such as promoting AI technology, advancing industries that utilize AI, and utilizing AI in social life.

1. Overview of key challenges

(1) Balancing AI risk management and innovation

While the benefits of AI are growing, as AI use expands and new technologies emerge, the risks they pose are also increasing. The AI Guidelines for Business (Version 1.1), published by the MIC and the METI in March 2025 after discussions at the “Joint meeting of Confer-

ence toward AI Network Society / AI Governance Review Committee” and the “Study Group on AI Business Guidelines” outlines not only technical risks but also social risks (risks related to ethics and law, economic activity, information space, and the environment).

(2) Japan's declining presence in the AI field

The current situation is that Japan's research and development in the field of AI is not highly regarded compared with companies leading AI development overseas, such as those in the U.S.

For example, according to the 2023 Global AI Vibrancy Ranking released by Stanford University's HAI (Human-Centered Artificial Intelligence) in November 2024, Japan is ranked 9th overall¹.

There are various possible reasons behind this, but some of the reasons why overseas AI-advanced countries are leading the way include, for example, in terms of investment, data, and human resources, the fact that

in the U.S., big tech companies and others who can utilize their enormous financial resources, data, and advanced technological development capabilities have made long-term investments in companies, including start-ups; and the fact that the U.S. has an advantage in each layer of the generative AI-related market, from applications to models and infrastructure (computing resources, specialized human resources, data), by utilizing the business foundations it has built through its past businesses; and in China, the existence of a system that enables technology development and investment by large platform operators and others².

2. Direction of response

In order to simultaneously promote innovation and address risks related to AI, it is necessary to take steps that will further promote innovation and utilize AI, such as formulating rules regarding AI both in Japan and over-

seas, working on risk management, and international collaboration, as well as promoting AI technology development, securing human resources, and utilizing AI in companies and society.

(1) Formulation of domestic rules in Japan

In Japan, in light of the rapid changes in AI technology and international discussions, the government established the AI Strategic Council in May 2023 as a control tower and is conducting intensive discussions. Based on the “Tentative Summary of AI Issues” compiled by the AI Strategic Council (May 2023), the MIC and the METI formulated and published the 1.0 version of the “AI Guidelines for Business” in April 2024³. In November of the same year, it was updated to version 1.01, and in March 2025, it was updated to version 1.1, taking into

account the latest trends both in Japan and overseas.

Furthermore, as the development of rules regarding AI continues both in Japan and overseas, the first AI Institutional Research Group was held in Japan in August 2024 under the AI Strategic Council. “Interim Report” was compiled in February 2025, and based on the “Interim Report,” the “Act on Promotion of Research and Development, and Utilization of Artificial Intelligence-related Technology” was enacted at the 217th session of the Diet (ordinary session) (Act No. 53 of 2025)⁴.

¹ Refer to “Trends in AI development and business expansion in Japan” in Section 2, 1 (3), Chapter 1, Part I

² Refer to “Leading the field of generative AI” in Section 3, 1 (2) (iii), Chapter 1, Part I

³ AI Guidelines for Business

https://www.soumu.go.jp/main_sosiki/kenkyu/ai_network/02ryutsu20_04000019.html

https://www.meti.go.jp/shingikai/mono_info_service/ai_shakai_jisso/20240419_report.html

⁴ In addition, with regard to AI safety assessment, in February 2024, in light of growing international interest in AI safety, the AI Safety Institute (AISII) was established within the Information-technology Promotion Agency (IPA) as an agency to study methods for assessing AI safety. In addition, the “Guide to Evaluation Perspectives on AI Safety” has been published, which outlines the basic concepts for evaluating the safety of AI systems, and indicates the risks and evaluation items anticipated in safety evaluations.

In addition, in order to promote the use of generative AI in various government operations and manage risks in tandem, the Digital Agency conducted studies in cooperation with the MIC, the METI, and others, and ⁵formulated the “Guideline for Japanese Governments’ Pro-

(2) Promotion of international collaboration

Given that the rapid development and spread of generative AI has become an important issue for the international community as a whole, the “Hiroshima AI Process” was launched at the G7 Hiroshima Summit in

(3) Promoting AI research and development, business development, and social implementation in Japan

As seen in Section 2, Chapter 1, research and development in the field of AI is being actively pursued by various Japanese organizations and companies, and a variety of initiatives are underway, ranging from the development of LLMs and business development utilizing such LLMs to efforts to utilize general-purpose and large-scale LLMs in collaboration with foreign business operators.

Meanwhile, while foreign business operators are far ahead in AI development, various policy measures are being taken to improve research and development at Japanese companies and organizations. For example, as a measure to support LLM development, the MIC is implementing measures at NICT to develop and expand

curements and Utilizations of Generative AI for the sake of Evolution and Innovation of Public Administration” (decided by the Council for the Promotion of a Digital Society Executive Board Meeting on May 27, 2025).

2023, with the aim of discussing international governance regarding generative AI. As part of this series of events, various international collaboration efforts are being undertaken⁶.

the training data required for LLM development in order to strengthen AI development capabilities. ⁷Going forward, measures that contribute to promoting and supporting AI research and development in Japan will remain important.

Furthermore, in addition to research and development of AI, it is necessary to actively promote its use in companies and other organizations, its application to business, and its social implementation. At the same time, it is necessary to secure, develop, and improve the literacy of human resources who can develop and utilize AI to support these efforts. Therefore, efforts to further promote innovation in AI and contribute to its utilization are required.

⁵ https://www.digital.go.jp/resources/standard_guidelines

⁶ Refer to the “Hiroshima Process” in Section 8, 5 (2), Chapter 2, Part II

⁷ Refer to “LLM research and development trends” in Section 2, 1 (3) (i), Chapter 1, Part I

Section 3 Responses to dis-/mis-information on the Internet

With the increasing usage rates of SNS, video sharing services, and internet news sites, the internet is becoming an important means for people to collect information. In particular, SNS is thought to be increasing its presence as social infrastructure for information gathering, dissemination, and communication.

In this context, problems surrounding the distribution of information in the digital space, such as the distribution and spread of dis-/mis-information on the Internet,

defamation, and other information that infringes on the rights of others, are also becoming more serious.

To address these issues, it is necessary to proactively take comprehensive measures, including institutional actions, support for the development of countermeasure technologies, and the improvement of ICT literacy, while taking into account international trends and giving full consideration to freedom of expression.

1. Overview of key challenges

Due to changes in the global situation, social structure, and technologies, the risk of the distribution and spread of dis-/mis-information is increasing. According to the World Economic Forum's Global Risk Report 2025¹, dis-/mis-information is currently ranked among the top serious risks for both the next two years and the next decade, and is considered the most significant risk over the next two years. For example, in the 2024 elections held around the world, there were a number of coverages of questionable or unconfirmed information².

Furthermore, in Japan, there is a growing problem with the distribution of information that infringes the

rights of others, such as defamation. For example, the number of consultations to the Illegal Harmful Hotline has remained high in recent years, reaching 6,403 in FY2024³. Furthermore, according to a survey⁴, 60.6% of respondents in the 2024 survey said they had “witnessed” posts on the Internet that hurt others (defamation). Over 40% of respondents have witnessed posts that use copyrighted materials such as images or videos from a work without permission (copyright infringement) or posts that use other people's photos or names without permission (**Figure 1-2-3-1**).

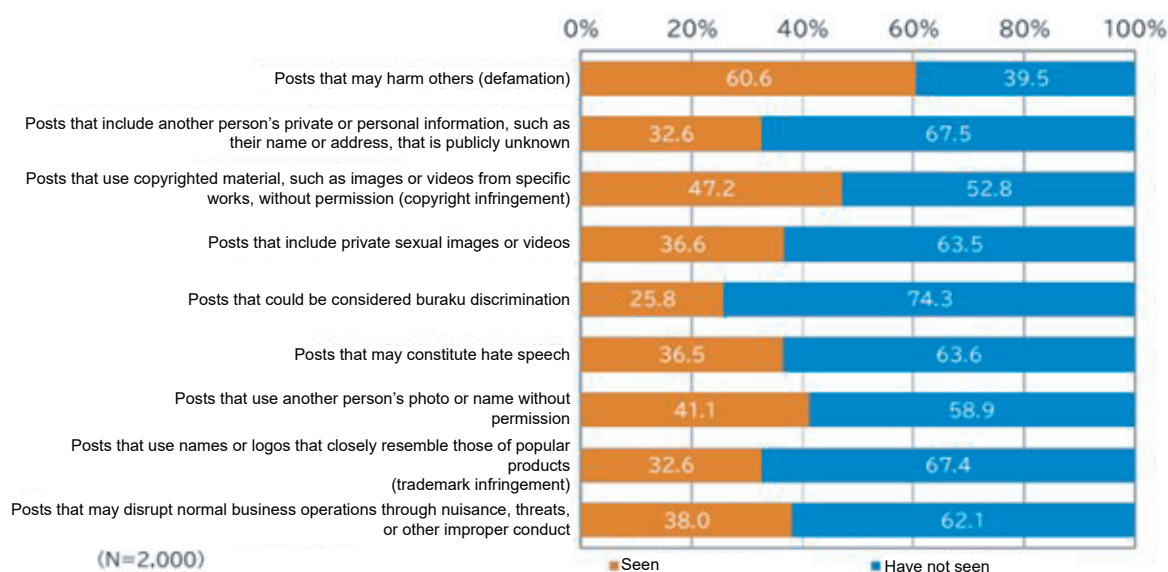
¹ WORLD ECONOMIC FORUM “Global Risks Report 2025” <<https://www.weforum.org/publications/global-risks-report-2025/>> (Reference March 10, 2025)

² With elections scheduled for 2024 around the world, and concerns about the misuse of AI to spread dis-/mis-information, in February 2024 major technology companies, including Google, Meta, X, and TikTok, signed the “Tech Accord to Combat Deceptive Use of AI in 2024 Elections” (as of April 2025, 27 companies are participating). The companies that signed the accord agreed to eight major commitments, including detecting false election content generated by AI and raising public awareness, and promised to work on measures to combat the deceptive use of AI in elections (AI Elections Accord “A Tech Accord to Combat Deceptive Use of AI in 2024 Elections” <<https://www.aielectionsaccord.com/>>). However, in reality, there have been reports of a series of incidents in the 2024 elections around the world, including interference with suspected false images, videos, and audio, and the dissemination of suspected false information. For example, in the 2024 U.S. presidential election, fake videos were released and circulated of people posing as election officials tearing up mail-in ballots, as well as information about large-scale malfunctions in voting machines.

³ Refer to Section 2, 2, Chapter 1, Part II “Current status of the telecommunications field in Japan”

⁴ MIC “Study Group on Addressing Issues Related to Information Distribution in the Digital Space (2nd meeting) Document 2-1” <https://www.soumu.go.jp/main_sosiki/kenkyu/digital_shokadai/index.html>

Figure 1-2-3-1 Experience of witnessing posts containing illegal or harmful information (October 2024)



(Source) MIC (2024) "Study Group on Addressing Issues Related to Information Distribution in the Digital Space (2nd meeting) Document 2-1"⁵

2. Direction of response

Addressing issues surrounding the distribution of information in the digital space requires comprehensive measures, including institutional responses, support for the development of countermeasure technologies, and

the improvement of users' ICT literacy. Here, recent developments in institutional responses, the development and support of countermeasure technologies, and the improvement of users' ICT literacy will be discussed.

(1) Enforcement of the Information Distribution Platform Act

In May 2024, a partial amendment to the Provider Liability Limitation Act (the Act on the Limitation of Liability of Specified Telecommunications Service Providers for Damages and the Right to Demand Disclosure of Sender Identification Information) was⁶ passed to obligate large-scale platform operators to take measures to (1) speed up their response and (2) make their operational status more transparent in order to deal with illegal and harmful information, such as defamatory comments, on the Internet. Under this revised law, the title of the law was also changed to the "Act on Measures Against Rights Infringement, etc. Arising from Distribu-

tion of Information by Specified Telecommunications" (Information Distribution Platform Act).

In order to enforce this amended act, the MIC clarified what types of information distribution constitute an infringement of rights or a violation of laws and regulations, and⁷ formulated "Illegal Information Guidelines" to provide examples of illegal information that large-scale specified telecommunications service providers should include when formulating "Standards for the implementation of transmission prevention measures." The amended act came into effect on April 1, 2025.

(2) Development of technologies against dis-/mis-information, and support for the development

In order to technically address the risk of the distribution and spread of dis-/mis-information on the Internet, including dis-/mis-information caused by generative AI, the MIC is promoting support for the development of countermeasure technologies through the "Development and Demonstration Projects for Countermeasure Technologies against Dis-/Mis- Information on the Internet."

For example, with regard to countermeasure technology for determining whether information on the Internet was generated by AI, development and demonstra-

tion have been underway since FY2024, primarily targeting images and videos. In FY2025, efforts will continue for the social implementation of these technologies, and in order to address the distribution and spread of even more dis-/mis-information in the future, it is planned to expand the scope of determination to include audio and other low-resource data that is difficult to distinguish.

In addition, since FY2024, development and demonstration efforts have been underway to create technologies that ensure the authenticity and reliability of infor-

⁵ MIC "Study Group on Addressing Issues Related to Information Distribution in the Digital Space (2nd meeting) Document 2-1" <https://www.soumu.go.jp/main_sosiki/kenkyu/digital_shokadai/index.html>

⁶ Act to Partially Amend the Act on the Limitation of Liability of Specified Telecommunications Service Providers for Damages and the Right to Demand Disclosure of Sender Identification Information (Act No. 25 of 2024)

⁷ Guidelines on Article 26 of the Act on Measures Against Rights Infringement, etc. Arising from Distribution of Information by Specified Telecommunications (Enacted on March 11, 2025)

mation senders, enabling recipients to assess the credibility of information amid the vast volume of content available on the Internet. In FY2025, these efforts will advance toward social implementation and interna-

tional standardization, while also expanding the scope of authenticity and reliability assurance to include the content of the sent information itself.

(3) Improvement of ICT literacy

In order to handle information appropriately, it is important to improve ICT literacy, as it is the foundation for appropriate handling.

In January 2025, the MIC announced the launch of “DIGITAL POSITIVE ACTION,” a public-private partnership project being promoted together with platform operators, telecommunications carriers, and IT-related companies, and other relevant organizations, with the aim of improving users’ ICT literacy on the Internet and SNS⁸. The comprehensive website, which was launched in February of the same year, lists various initiatives such as events and educational materials by affiliated companies and organizations. In May of the same year, in connection with the “DIGITAL POSITIVE ACTION,” the “ICT Literacy Survey” was published to assess the

current state of ICT literacy, such as users’ awareness of ICT literacy and the tendency of spread of dis-/mis-information, and to promote efforts to improve ICT literacy⁹. The survey revealed that 25.5% of people who came into contact with dis-/mis-information spread it using some means, highlighting the importance of efforts to improve users’ ICT literacy. To further raise awareness of users’ ICT literacy, TV and web commercials for ICT literacy began to be broadcasted in the same month¹⁰. Going forward, this project plans to continue holding seminars and symposiums conducted by a variety of companies and organizations, creating educational materials, and conducting public relations activities for citizens using various advertising media.

⁸ MIC “Let’s build and protect a safe and enjoyable information society DIGITAL POSITIVE ACTION” <<https://www.soumu.go.jp/dpa/>> (Reference March 14, 2025)

⁹ MIC “ICT Literacy Survey” <https://www.soumu.go.jp/main_content/001008791.pdf>

¹⁰ “MIC | Press Release | Publication of the Results of Survey on ICT Literacy and Launch of TV and Web Commercials” <https://www.soumu.go.jp/menu_news/s-news/01ryutsu05_02000176.html>

Section 4 Cybersecurity

While the use of digital technologies is expanding in all aspects of society, cyberattacks are becoming more complex and sophisticated against the backdrop of a destabilizing and tense global situation, and the expansion of digital use is leading to increased system complexity and an broadening of the attack surface facing the Internet. As a result, security risks such as the leakage of confidential information due to ransomware and zero-day attacks and the suspension of services of critical infrastructure are on the rise.

As society becomes more dependent on digital infra-

structure, the scale and scope of damage caused by a cyber incident is expected to expand further, posing serious security concerns.

Ensuring cybersecurity in the digital space requires that stakeholders raise their standards and work together. It is important to take comprehensive measures by all stakeholders, including government responses, public-private collaboration, international cooperation, technological measures, and the improvement of citizens' literacy.

1. Overview of key challenges

The risk of cyberattacks is increasing year by year. For example, according to the National Institute of Information and Communications Technology (NICT), the total number of packets observed per IP address in NICTER's darknet observation network increased in 2024 compared to the previous year, suggesting that reconnaissance activities on the Internet are becoming

even more active¹.

Furthermore, if critical infrastructure for socio-economic activities were to be damaged or its services suspended due to a cyberattack, it could cause major social unrest. During FY2024, various cyberattacks targeting critical infrastructure and other areas occurred.



Figure (related data) Examples of cyberattack damage related to critical infrastructure in Japan in FY2024

Source: Prepared from published materials, etc.

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00075>
(Data collection)

2. Direction of response

Ensuring cybersecurity in the digital space requires that all stakeholders raise their standards and work together. Here, a recent trend in the government's response, which is the establishment of legislation regarding active cyber defense, will be discussed.

In recent years, the theft of information from internal systems of governments and companies through cyberattacks has become a major problem, and concerns are rapidly growing about cyberattacks with advanced intrusion and hiding capabilities aimed at shutting down the functions of critical infrastructure, etc. In particular, serious cyberattacks aimed at disrupting or destroying critical infrastructure are becoming a major security concern, as they are being carried out on a daily basis,

including state-sponsored cyberattacks.

In order to address this situation, based on the "National Security Strategy" (Cabinet decision of December 16, 2022), and to improve Japan's response capabilities in the field of cybersecurity to the same level as major European and American countries, two bills were submitted to the 217th session of the Diet (ordinary session) in 2025: "the Act on the Prevention of Damage from Unauthorized Acts Against Critical Computers" and "the Act Concerning Development of Laws Related to Enforcement of the Act on the Prevention of Damage from Unauthorized Acts Against Critical Computers" After amendments to the original drafts, the bills were passed and enacted in May 2025.

¹ Refer to "Current status of cybersecurity" in Section 10, 2, Chapter 1, Part II

Chapter 3

Toward Solving Social Issues through Advancing Digital Technologies

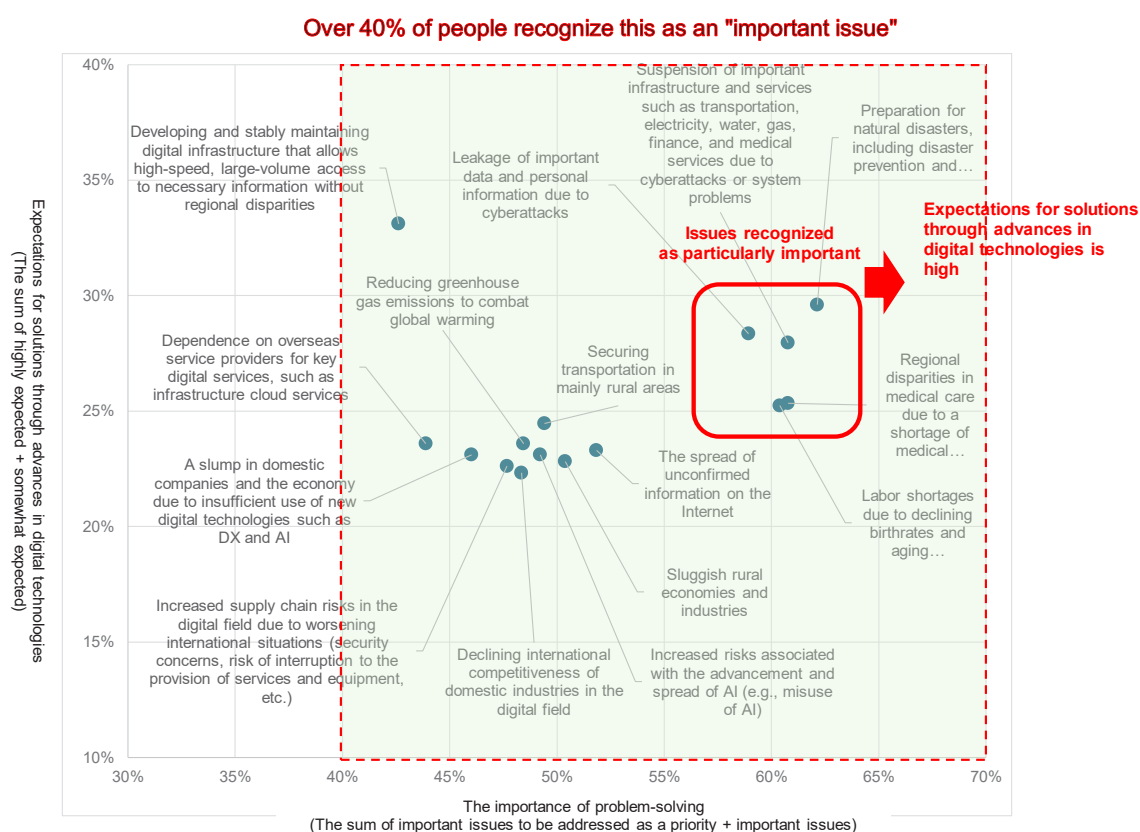
In Japan, the problem of a declining birthrate and aging population is becoming increasingly serious, and responding to the impoverishment and decline of local economies and the intensification of disasters has also become an important social issue. It is expected that further expanding the effective use of evolving digital technologies will contribute to solving and alleviating these social issues.

A survey was conducted on the importance of resolving major social issues and issues in the digital field, and the level of expectation that advances in digital technologies will lead to solutions to these social issues. For all issues, more than 40% of people responded that they recognized the presented issues as important issues (the sum of “important issues that should be addressed as a priority” and “important issues”). Among these, the ar-

reas where there were particularly high expectations for the advancement of digital technologies to solve problems included “preparation for natural disasters, including disaster prevention and mitigation,” “regional disparities in medical care due to a shortage of medical professionals,” “labor shortages due to a declining birthrate and aging population,” as well as preventing cyberattacks, system failures, and related issues. Additionally, the highest percentage of respondents said they expect digital technologies to be used to develop and stably maintain a large-capacity, high-speed digital infrastructure without regional disparities (**Figure 1-3-1-1**).

This chapter provides an overview of the role and prospects for digital technologies in resolving Japan’s major social challenges.

Figure 1-3-1-1 Importance and the level of expectation for solving social issues and issues in the digital field



(Source) MIC (2025) “Survey on the latest trends in ICT, R&D, and digital utilization in Japan and other countries”

Section 1 Revitalizing and Growing Japan’s Economy

In the future, as digital technologies such as AI and robots advance and become more widely used in society, it is expected that they will help revitalize the economy

by solving labor shortages, improving productivity and enhancing competitiveness in Japan, which is facing a declining birthrate and aging population, and population

decline. In addition, from the perspective of Japan's economic growth, and in light of the increasingly uncertain global situation, from the perspective of economic security, ensuring the autonomy of companies and organiza-

tions based in Japan by expanding the provision of services in the digital field is an important issue, therefore, it is important to promote efforts to strengthen the international competitiveness of Japan's digital companies.

1. Promoting the use of evolving digital technologies for business

One direction for efforts to link advancing digital technologies to economic growth is to utilize advancing digital technologies in areas where Japan or individual companies and organizations have strengths.

For example, the results of a survey conducted by the MIC show that Japan is lagging behind the U.S., China, and Germany in terms of utilizing digital technologies to transform business operations and formulating policies for using AI. Furthermore, compared with these foreign

companies, the range of business fields in which generative AI is utilized is not as extensive¹. It remains important for companies not only to achieve labor savings and efficiency by transforming entire business processes through DX, AI, robotics, etc. and utilizing them in a variety of operations, but also to work on innovations that bring new added value through digital technologies while leveraging their strengths².

2. Efforts to strengthen competitiveness in the digital field

Promoting efforts to strengthen competitiveness in the digital field is also an important challenge. In the digital field, technological innovation has often brought about major game-changing reforms, dramatically altering mainstream services and providers. It has been pointed out that accurately capturing this game-changing wave will be a major key to business development in the digital field. Considering that ensuring Japan's autonomy in key services and infrastructure in the digital field is an important issue, ³it is desirable to approach the issue in a way that makes use of Japan's strengths and ensure Japan's international competitiveness in key areas of the next digital infrastructure and services.

For example, AI is a field where major technological innovations are often occurring. While there is a technological background in the form of "Scaling Law" that favors those who can make large-scale investments, the development of small-scale LLMs, which have relatively limited training data and computational volume, is point-

ed out as an area in which Japanese companies and organizations can demonstrate their strengths, as it requires model diversity, such as customization for individual companies. ⁴It is also anticipated that small-scale models will have an advantage in dealing with power constraints and handling highly confidential information. Furthermore, there is potential for new players to bring about technological innovation, and it is a field with a wide range of potential applications. Considering the potential for game-changing technological innovation, it is important to continue developing domestic LLMs, while promoting business development and social implementation of AI, and to capture the game-changing wave that comes with technological innovation⁵. Various Japanese companies are already working on developing such LLMs, and the government's policies are also supporting this⁶.

Robots, combined with advances in AI, are also a field that could see a game-changing impact, and various re-

¹ Refer to "Trends in digital usage" in Section 11, Chapter 1, Part II for international comparison of digital usage in companies Refer to "Current status of AI usage in companies" in Section 2 (2), Chapter 1, Part I for the status of formulating AI usage policies in companies and AI usage for business operations

² As a specific example, in the content field, digital technologies make it easy to deliver content around the world, transcending national and language barriers; the global content market has grown rapidly since recovering from the COVID-19 pandemic; and there is a growing labor shortage in the content industry, making digitalization increasingly important in content production. In light of this situation, in October 2024, the Japan Business Federation published a proposal for promoting Japan's content field ("Entertainment Contents ∞ 2024"). Here, in particular, promoting digital transformation in content production, developing and utilizing generative AI, and supporting the creation, challenges, and growth of Japanese content platformers will be discussed as digital-related efforts.

³ From the perspective of business development that leverages the trust in Japan as a strength, given today's unstable global situation and geopolitical risks, there is a growing need for data storage, business infrastructure development, and collaboration in countries and regions that are as trustworthy as one's own, and it has been pointed out that Japan is in a fairly good position in this regard (based on an interview with Professor Kokuryo Jiro of the Faculty of Policy Management, Keio University). In addition, it has been pointed out that the stability of Japan's politics and administration is highly regarded worldwide, making it an attractive investment destination, and that increasing the predictability of business could also help Japan to demonstrate its presence (based on an interview with Professor Suzuki Kazuto of the Graduate School of Public Policy, The University of Tokyo). One of the possibilities Japan could aim for is to take advantage of Japan's such trust and stability to attract investment and collaboration from foreign business operators.

⁴ Based on an interview with Okanohara Daisuke, CEO of Preferred Networks, and Kinoshita Masafumi, Executive Officer of ABEJA, Inc.).

⁵ In the field of AI, which requires large-scale investments and advanced technologies, it may be difficult in the short term for Japan to immediately develop a model comparable to the cutting-edge LLMs led by foreign business operators. However, with various technological innovations likely to occur, from a medium- to long-term perspective, it has been pointed out that Japan needs to simultaneously work on developing and using general-purpose domestic LLMs (or next-generation AI resulting from future technological innovations) in light of the need for Japan's economic security and the protection of important data, as well as ensuring transparency of training data and training methods, cultural perspectives, and the improvement of Japan's AI technological capabilities (based on an interview with Okanohara Daisuke, CEO of Preferred Networks). Furthermore, in addition to the need to use domestically produced general-purpose LLMs in situations where important data protection is required, it is expected that countries that find it difficult to develop AI domestically will choose to introduce inexpensive foreign-made AI, while keeping security risks in mind. It has also been pointed out that Japan should also improve its technological capabilities in developing general-purpose LLMs that can be reused in other countries, and use the high level of quality and security as a competitive edge to deploy AI models overseas (based on an interview with Professor Suzuki Kazuto of the Graduate School of Public Policy, The University of Tokyo).

⁶ Refer to "LLM research and development trends" in Section 2, 1 (3) (i), Chapter 1, Part I

search and development activities and efforts for social implementation are underway in Japan⁷.

Moreover, an example of an initiative being undertaken in the field of next-generation communications is the IOWN concept proposed by NTT. Various initiatives are steadily progressing, including the formation of a global ecosystem, such as the formation and expansion of the IOWN Global Forum and the start of training engineers overseas.

Government efforts to strengthen competitiveness in

the digital field are being undertaken at various levels by relevant ministries and agencies. For example, the MIC established a permanent fund at NICT in March 2023 and newly launched the Innovative ICT Fund Projects for Beyond 5G/6G, within which it has established three programs, including the “Strategic Program for Social Implementation and Global Deployment,” which will carry out research and development projects aimed at social implementation and overseas deployment.

⁷ Refer to “Trends in AI robotics research and development and social implementation” in Section 2, 1 (3) (i), Chapter 1, Part I

Section 2 Regional Revitalization

The issue of a declining birthrate and aging population is even more serious in rural areas. Measures are urgently required to address issues such as the exhaustion of rural economies and the maintenance of rural social infrastructure. It is important to fully leverage digital technologies and new technologies for promoting initiatives to maintain and improve the living environment in rural areas and revitalize rural economies. In this context, the “Basic Plan for Regional Revitalization 2.0,” approved by the Cabinet in June 2025, sets out the thorough utilization and social implementation of new technologies such as AI and digital technologies as one of the basic approach and perspectives of Regional Revitalization 2.0, with the aim of creating sustainable local communities where local residents can enjoy a safe and

comfortable living environment, as well as leading to sustainable growth and strengthening of the competitiveness of the local economy.

The MIC is implementing Regional Community DX Promotion Package Project in order to realize Regional Revitalization 2.0 using ICT technologies. This project aims to create good examples of digital implementation through comprehensive measures such as supporting the securing of digital human resources and systems, demonstrating advanced solutions such as AI and autonomous driving, and advanced wireless systems, and subsidizing the development of regional communications infrastructure, as well as to quickly put digital technologies into practical use nationwide by disseminating the necessary information effectively and efficiently.

1. Improving the living environment in rural areas

Labor shortages caused by a declining birthrate and aging population are having a negative impact on the living environment in rural areas. In order to maintain and ensure an environment in which people can live safely in

rural areas, it is necessary to ensure stable maintenance and management of infrastructure and to ensure that public and quasi-public services are accessible when needed.

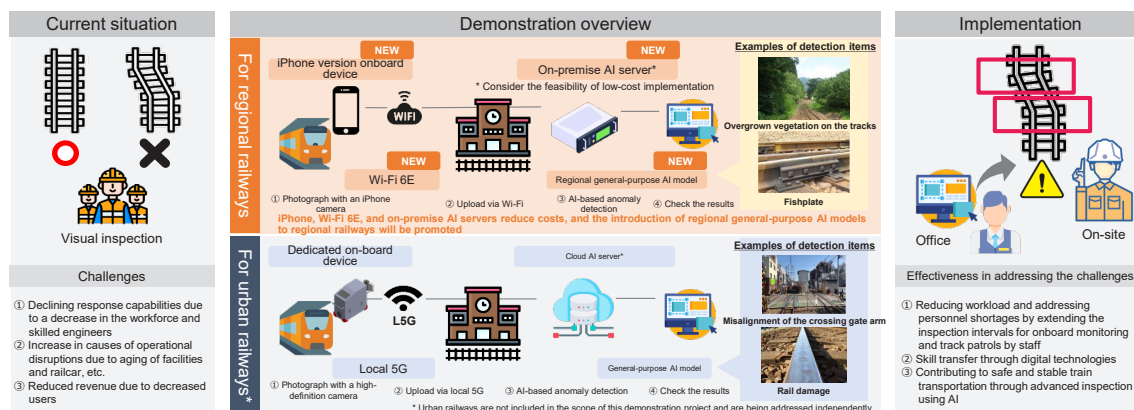
(1) Infrastructure maintenance and management

In Japan, the problems of aging infrastructure and a decline in the workforce are becoming more serious. To address this issue, there is a growing need to improve the sophistication and efficiency of infrastructure maintenance and management through technologies such as AI.

For example, regional railways face challenges in ensuring business continuity due to declining ridership and a shrinking pool of job applicants, which weakens their operational capacity. At the same time, the growing risks of accidents caused by intensifying natural disasters and aging infrastructure raise further concerns, making it increasingly difficult to rely on traditional visual inspection methods for future operation and maintenance.

In response to this, a demonstration project is being carried out as part of the MIC's FY2024 Regional Digital Infrastructure Utilization Promotion Project (demonstration project) to build a system in which high-resolution video data from a train's front-facing camera (on-board device) is transmitted to an AI server and analyzed for abnormalities in track facilities, etc., replacing patrol work that normally takes several hours with AI, and by checking only the necessary areas on-site, reducing the workload and shortening the time required. To build a general-purpose AI model, joint verification is being carried out with 30 railway companies nationwide in collaboration with urban railways, and solutions for regional railways are being developed (Figure 1-3-2-1).

Figure 1-3-2-1 Overview of the “joint creation of railway digital innovation project utilizing Wi-Fi 6E, AI, etc. for regional railway operators”



(Source) MIC (2025) “Report on the result of the joint creation of railway digital innovation project utilizing Wi-Fi 6E, AI, etc. for regional railway operators”

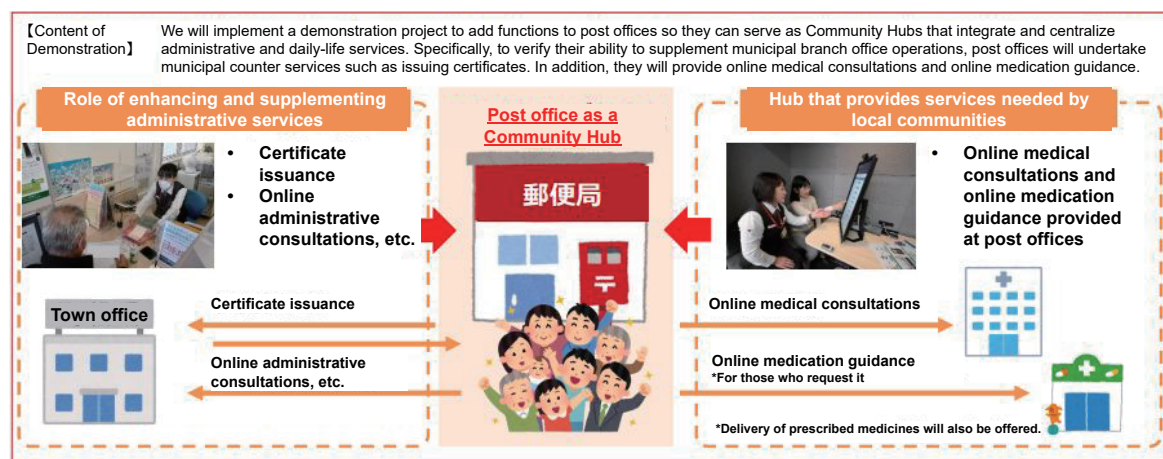
(2) Public and quasi-public services

The declining population due to a declining birthrate and aging population is threatening the maintenance of public local infrastructure such as administrative services and medical care, as well as residents' access to those services. For this reason, there is a need to provide sustainable services that utilize digital technologies and are tailored to the lifestyles of residents.

For example, the MIC has been conducting demonstration projects in which post offices and local public infrastructure such as local governments work together to solve various regional issues, and has been implementing the “Project for Promotion of Public Regional

Infrastructure Cooperation of Post Offices, etc.” since FY2022, with the aim of promoting model cases nationwide. One of the demonstration themes for this project in FY2024, “Providing Services Essential to Local Communities, with Post Offices as ‘Community Hubs’” was carried out in Akiota Town, Hiroshima Prefecture. Post offices will act as “community hubs” that provide a variety of services in a centralized manner, offering services such as online medical consultations, medication guidance, and counter services for local government organizations (Figure 1-3-2-2).

Figure 1-3-2-2 Providing Services Essential to Local Communities, with Post Offices as “Community Hubs”



(Source) MIC material¹

(3) Digital infrastructure

In order to use advancing digital technologies, communications infrastructure that can stably carry out large-capacity, ultra-high-speed communications is necessary even in rural areas. In the future, traffic volume is expected to increase dramatically due to the growing need for real-time exchange of large volumes of high-definition video and image data for the use of AI and other technologies, and the need for advanced communication infrastructure such as 5G and optical fiber to support this is thought to be greater than ever before.

For example, in its “Advanced Wireless Environment Development Promotion Project,” the MIC subsidizes part of the costs when local governments, telecommunications carriers, etc. develop optical fiber, etc., which is a prerequisite for high-speed, large-capacity wireless communication, in disadvantaged areas, with the aim of realizing advanced wireless environments such as 5G and IoT, and when local governments maintain and manage optical fiber, etc., in remote island areas².

2. Revitalizing rural economies

In regions facing serious labor shortages, improving productivity through the use of digital technologies is an urgent priority, and efforts are underway across various sectors. In addition, for the development of regional economies, it is essential to create high-value-added services by utilizing digital technologies in industries that leverage the characteristics and appeal of each region. In this regard, approaches can be considered from a variety of fields, such as creating and branding local specialties in the agriculture, forestry and fisheries indus-

tries, and improving the brand value of traditional crafts.

For example, smart agriculture measures are being taken in the agricultural field, which is facing a shortage of successors. Obihiro City in Hokkaido utilized a demonstration project under the MIC’s “FY2024 Regional Digital Infrastructure Utilization Promotion Project,” along with grants for the Vision for a Digital Garden City Nation, to develop and test a communication environment and agricultural machinery tailored to the region. Through this project, Obihiro City built cooperative rela-

¹ MIC “Implementation of the Demonstration Project for ‘Providing Services Essential to Local Communities, with Post Offices as Community Hubs’ as part of the ‘Project for Promoting Collaboration between Post Offices and Regional Public Infrastructures’ for FY 2024” <https://www.soumu.go.jp/menu_news/s-news/01ryutsu13_02000134.html> (Reference March 24, 2025)

² MIC “Broadband Infrastructure Development” <https://www.soumu.go.jp/main_sosiki/joho_tsusin/broadband/index.html> (Reference March 25, 2025)

tionships with private companies and universities, and is promoting labor-saving and efficiency improvements using new digital technologies, such as crop management

that combines drones and AI, and demonstration of simultaneous operation of multiple unmanned tractors³.

³ MIC “Simultaneous control of four tractors! Smart agriculture evolving in Obihiro” <https://dx-navi.soumu.go.jp/index.php/support_r6/digital_kiban/article/005> (Reference Marc 27, 2025)

Section 3 Responding to Increasingly Severe Disasters

In recent years, as disasters become more severe and frequent in Japan, which makes it important to take more advanced disaster prevention measures than ever before, disaster prevention and reduction through the use of digital technologies are expected to have great effects. In addition, although telecommunications and broadcasting networks have been made more resilient in response to frequent disasters, such as earthquakes, it is still required to make digital infrastructure more resilient.

For example, in order to utilize digital technologies for disaster prevention and reduction, a robust digital infrastructure is necessary. Of these, broadcasting networks play a major role as a method of transmitting information during disasters, but in the earthquake that occurred in the Noto region of Ishikawa Prefecture in January 2024, terrestrial television broadcasting, radio broadcasting, and cable television were all disrupted due to power outages, damage to relay station equipment, and cable breaks. Learning from this experience,

the MIC reinforced its support projects for strengthening broadcasting networks. In addition, cooperation among broadcasting companies is also being promoted in order to respond to disasters.

Furthermore, to support the strengthening of communication networks, the MIC plans to launch a “Project to strengthen mobile phone base stations in the event of disasters” in FY2025. Moreover, to strengthen the resilience of communication networks and recovery systems, telecommunications carriers are expanding their measures by developing mobile base stations and utilizing ¹unmanned aerial vehicles and low-orbit satellites.

In addition, with regard to data centers and submarine cables, which are important digital infrastructures that support a digital society, promoting regional decentralization has become an important issue from the perspective of disaster prevention, and efforts are being made to address this².

There is a continuing need to build digital infrastructure that is resilient to disasters.

¹ Refer to “Utilization of NTN” in Section 1, 2 (1), Chapter 2, Part I for the utilization of NTN

² Refer to “Decentralization of data centers and submarine cables” in Section 1, 2 (1) (i), Chapter 2, Part I for the decentralization of data centers and submarine cables

Part 2

Current Status and Issues in the Information and Communications

Chapter 1

Trends in the ICT Market

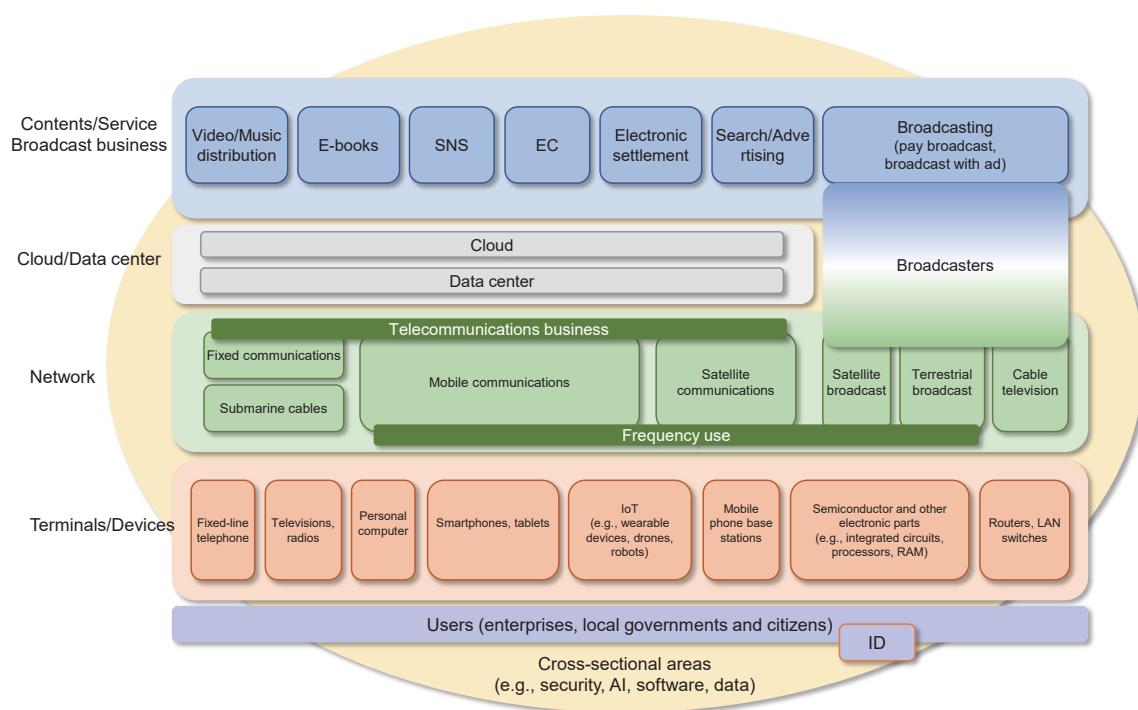
Section 1 Trends in the ICT Industry

1. Size of the ICT Market

ICT includes devices and terminals that serve as user interfaces, networks provided by telecommunications and broadcasting companies, cloud and data centers,

content services such as video and music streaming, and security and AI (**Figure 2-1-1-1**).

Figure 2-1-1-1 Structure of the ICT market by layer



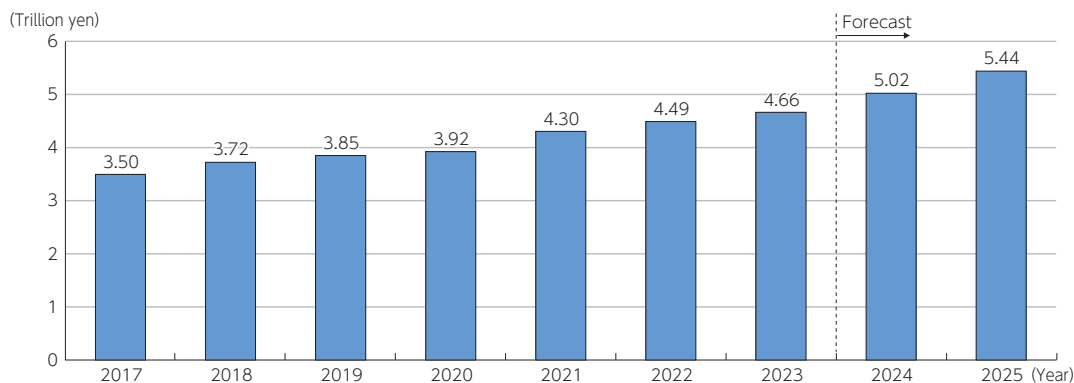
(Source) Prepared by MIC

The global ICT market (expenditure)¹ has been on an upward trend in recent years. It is expected to reach 5.02 trillion dollars in 2024 (a 7.7% increase from the previous

year), and 5.44 trillion dollars in 2025 (an 8.3% increase from the previous year) (**Figure 2-1-1-2**).

¹ It includes IT services, communications services, software, infrastructures, devices, peripheral equipment, and cybersecurity, etc.

Figure 2-1-1-2 Changes and forecasts of the size of the global ICT market (expenditure)

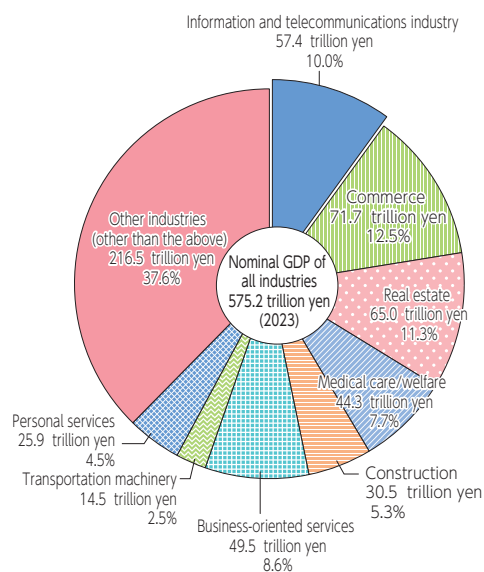
(Source) Prepared based on data from Canalys²

2. Gross Domestic Product (GDP) of the ICT industry³

The nominal GDP of the information and communications industry in 2023 was 57.4 trillion yen, a 3.5% increase compared to the previous year (55.5 trillion yen) (Figure 2-1-1-3, Figure 2-1-1-4). When examining the nominal GDP trends by sector within the informa-

tion and communications industry, most sectors have remained relatively stable, while the information services and Internet-related services sectors have shown an increasing trend (Figure 2-1-1-5).

Figure 2-1-1-3 GDP of major industries (nominal)

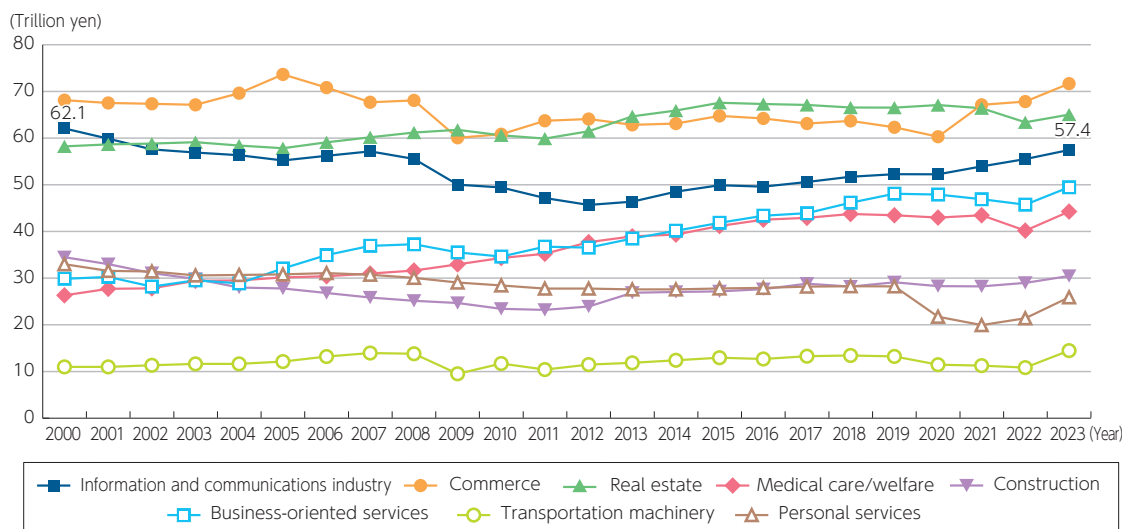


(Source) MIC(2025) "Survey on Economic Analysis of ICT in FY2024"

² <https://www.canalys.com/insights/it-spending-forecasts-2025>

³ The ICT industry consists of nine sectors: telecommunications, broadcasting, information services, services incidental to the Internet, video/sound/text information production, manufacturing related to information and communications, services related to information and communications, construction related to information and communications, and research.

Figure 2-1-1-4 Changes in nominal GDP of major industries



(Source) MIC(2025) "Survey on Economic Analysis of ICT in FY2024"

Figure 2-1-1-5 Changes in nominal GDP of the ICT industry



(Source) MIC(2025) "Survey on Economic Analysis of ICT in FY2024"

3. ICT investment⁴

In 2023, private sector ICT investment in Japan amounted to 16.0 trillion yen (2015 year prices), a 1.1% decrease from the previous year. Software (custom development and packaged software) accounted for 9.8 trillion yen, nearly 60% of the total. The ratio of information investment to total private sector capital investment was 17.5% (a 0.4 percentage point decrease from the previous year) in 2023, indicating that ICT investment holds a

significant position within capital investment (Figure 2-1-1-6).

Comparing the trends in ICT investment between Japan and the U.S., ICT investment in the U.S. showed a steady increase despite temporary setbacks, while Japan's ICT investment continues to show a gradual increase or flat trend (Figure 2-1-1-7).

⁴ Here the term refers to investment in information and communications capital goods (computers and peripheral equipment, telecommunications equipment, software). The use of cloud services that have spread drastically in recent years is the purchasing of a service rather than the purchasing of capital goods and therefore is not included in IT investment here.

Figure 2-1-1-6 Changes in ICT investment in Japan

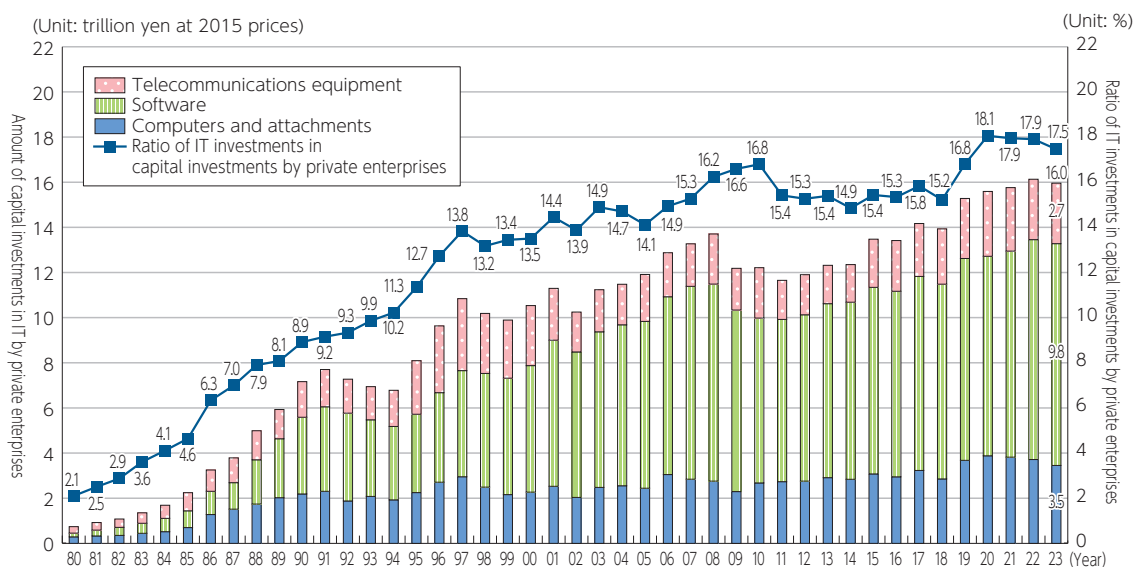
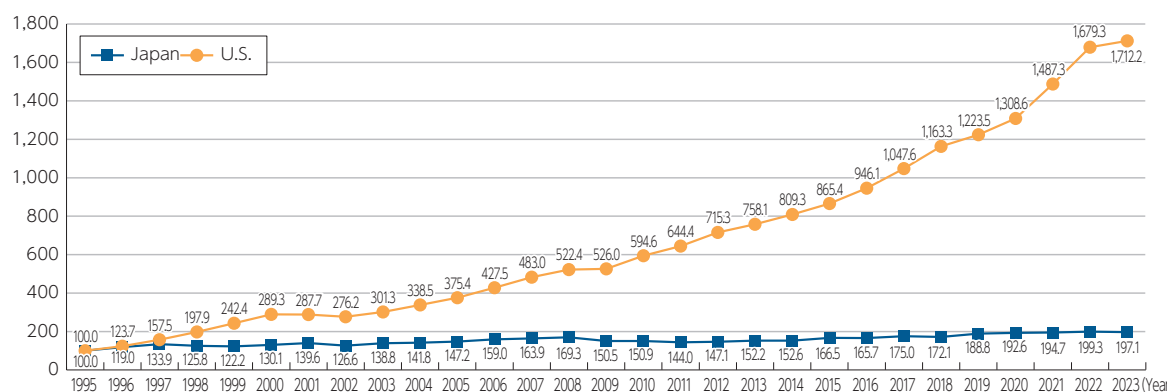


Figure 2-1-1-7 Comparison of ICT investment in the private sector in Japan and the U.S.



* Indexing year 1995=100 (Japan: price in 2015, the U.S.: price in 2012)

(Source) MIC(2025) "Survey on Economic Analysis of ICT in FY2024"

4. Exports and imports in the ICT field

Regarding the services balance in the balance of payments statistics, the Bank of Japan Review "Globalization of Services Trade as Seen in Balance of Payments Statistics"⁵ classifies digital-related items as follows: (1) computer services, (2) copyright royalties and license fees, (3) professional and management consulting services, in addition, (4) communications services, and (5) information services. In recent years, the total deficit amount for items (1) through (3) in particular, has increased rapidly, gaining attention as the so-called "digital deficit." It should be noted that this includes balance of payments related to services other than the digital field.

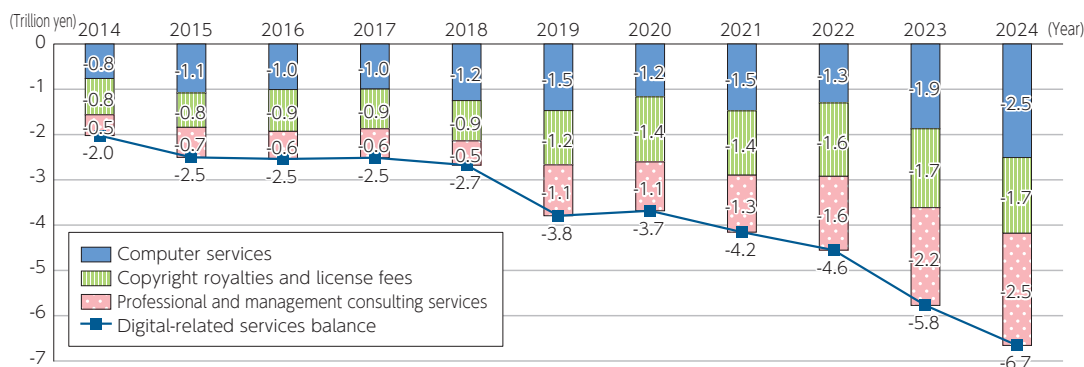
For example, the total balance of (1) computer services, (2) copyright royalties and license fees, and (3) professional and management consulting services was in deficit in 2024, with a deficit of approximately 6.7 tril-

lion yen (an increase of approximately 0.9 trillion yen from the previous year) (if (4) communications services and (5) information services are added to this, the deficit would have been approximately 6.8 trillion yen (an increase of approximately 0.9 trillion yen from the previous year)) (Figure 2-1-1-9).

Regarding "Communications, computer, and information services," which are largely composed of computer services such as fees for cloud services and online meeting systems, the balance of payments by country and region shows that in 2024, the largest deficits were with the U.S., Singapore, the Netherlands, China, and Sweden, in the respective order. In terms of the payment amounts, the amounts were the largest for the U.S., Singapore, and the Netherlands in 2024, in the respective order.

⁵ https://www.boj.or.jp/research/wps_rev/rev_2023/data/rev23j09.pdf

Figure 2-1-1-9 Changes in the digital-related services balance



* Here the figures indicate the total balance of payments of computer services, copyright royalties and license fees, and professional and management consulting services

(Source) Prepared based on "Balance of Payments Statistics" by the Ministry of Finance



Figure (related data) Changes in the digital-related services balance (computer services, copyright royalties and license fees, professional and management consulting services, communications services, information services)

Source: Prepared based on the Ministry of Finance's "Balance of Payments Statistics"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00094>

(Data collection)



Figure (related data) Changes in amounts received and paid for the digital-related services (computer services, copyright royalties and license fees, professional and management consulting services, communications services, information services)

Source: Prepared based on the Ministry of Finance's "Balance of Payments Statistics"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00095>

(Data collection)



Figure (related data) Changes in communications, computer and information services balance (by recipient, payment destination country and region)

Source: Prepared based on the Ministry of Finance's "Balance of Payments Statistics"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00096>

(Data collection)

Based on trade statistics from the Ministry of Finance⁶, the difference between the amount of ICT goods⁷ exported from Japan and the amount of ICT goods imported into Japan shows that the deficit has been increasing in recent years, reaching a deficit of 3,416.8 billion yen in 2024. It should be noted that these statistics only show the amount of exports from Japan to overseas and the amount of imports from overseas to Japan, and do not reflect exports from overseas production bases of Japanese companies to countries other than Japan, and that when products produced at overseas bases of Japanese companies are import into Japan, it is counted as an "import."

Looking at each item, "other electronic components" had the largest surplus in 2024, and the surplus in "inte-

grated circuits" was also large. On the other hand, the largest deficit was in "mobile phones," and the deficit has been increasing in recent years. The second largest deficit was in "personal computers," followed by "computer units (excluding personal computers)," and "wired telecommunications equipment." Parts and components, etc. tend to generate larger surpluses, while final products tend to have larger deficits.

Looking at the top countries and regions that account for large shares of Japan's imports and exports of major ICT goods with large trade amounts, China was the largest source of imports of mobile phones and personal computers in 2024. As for exports, Taiwan was the largest destination for integrated circuits, China for other parts, and the U.S. for computer peripheral equipment.

⁶ The import value in trade statistics is based on CIF (Cost, Insurance and Freight, which includes the price of the cargo as well as insurance and freight costs to the destination), and the export value is based on FOB (Free on Board, which is the shipping price in the exporting country). It does not include after-shipment insurance and freight costs to the destination). Here, the difference between the export value and the import value is calculated mechanically.

⁷ The following goods are included in the scope of ICT goods in the Ministry of Internal Affairs and Communications "Information and Communications Industry Input-Output Table." Personal computers, computer units (excluding personal computers), computer peripheral equipment, wired telecommunications equipment, mobile phones, wireless telecommunications equipment (excluding mobile phones), telecommunication cables and optical fiber cables, office machines, semiconductor devices, integrated circuits, liquid crystal panels, flat panels and electron tubes, and other electronic components.



Figure (related data) Changes in the value of Japan's imports and exports of ICT goods based on the Ministry of Finance's trade statistics

Source: Prepared based on the Ministry of Finance's "Trade Statistics"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00098>
(Data collection)



Figure (related data) Countries and regions where major ICT goods are imported from or exported to (top 3 countries)

Source: Prepared based on the Ministry of Finance's "Trade Statistics"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00099>
(Data collection)

5. Trend of R&D in the ICT field

(1) Situation of research and development expenditure

A Trends in research and development expenditure in major countries and regions

In 2021, the U.S. maintained the top position in research and development expenditure at 806 billion dollars. Following the U.S. were China, the EU, and Japan,

with Japan's research and development expenditure showing a flat trend, and the gap with the top countries widening.



Figure (related data) Trend of total expenditure on research and development in major countries and regions

Source: Japan Science and Technology Agency, Research and Development Strategy Center "Overview of Research and Development Report (2024)"

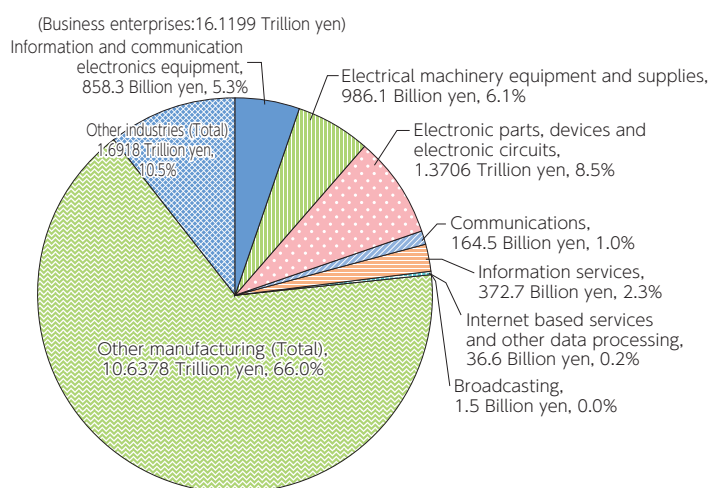
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00102>
(Data collection)

B Situation of research and development expenditure in our country

In FY2023, the total amount of research and development expenditure in Japan (the sum of research expenditure by business enterprises, non-profit institutions and public organizations, universities and colleges) (hereinafter in this section referred to as the "R&D expenditures") was 22.497 trillion yen, with the R&D ex-

penditures of business enterprises amounting to 16.1199 trillion yen. Among the R&D expenditures of business enterprises, the R&D expenditures in the information and communications industry⁸ were 3.7902 trillion yen (23.5%) (**Figure 2-1-1-11**), and it has shown a trend of stagnation in recent years (**Figure 2-1-1-12**).

Figure 2-1-1-11 Percentage of R&D expenditures of business enterprises (FY2023)

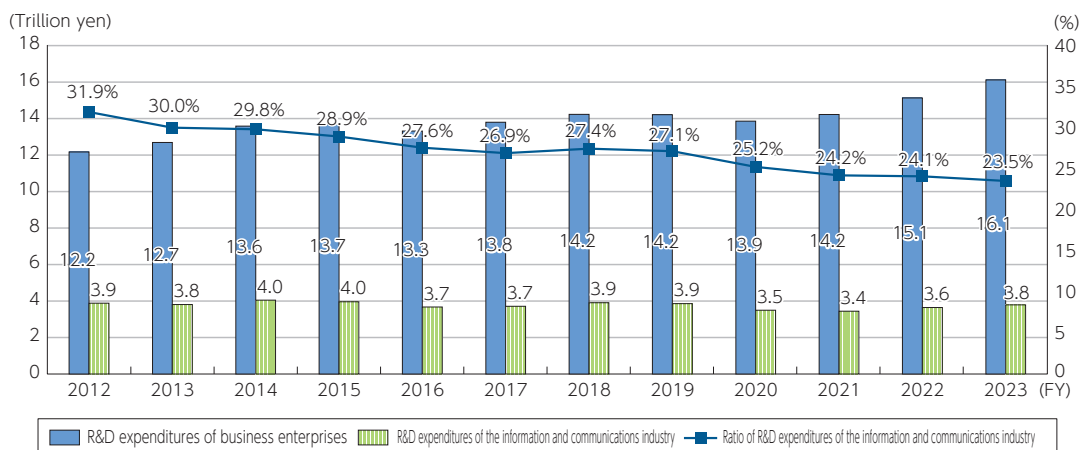


(Source) Prepared based on MIC "2024 Survey of Research and Development"⁹

⁸ Here, the term refers to information and communication electronics equipment, electrical machinery equipment and supplies, electronic parts, devices and electronic circuits, information and communications (information services, communications, broadcasting, and Internet based services and other data processing)

⁹ <https://www.stat.go.jp/data/kagaku/index.html>

Figure 2-1-1-12 Trend of R&D expenditures of business enterprises

(Source) Prepared based on MIC "Survey of Research and Development"¹⁰ for each FY**(2) Situation of persons employed in research and development****A Trends in the number of researchers in major countries and regions**

The number of researchers in major countries¹¹ is increasing. In 2023, the number of researchers in Japan was 0.706 million, ranking third in size after China (2.406 million in 2021) and the U.S. (1.639 million in 2021).

Looking at the latest values for other countries in descending order: the Republic of Korea (0.489 million in 2022), Germany (0.485 million in 2022), France (0.346 million in 2022), and the UK (0.296 million in 2017).

**Figure (related data) Changes in the number of researchers in major countries and regions**

Source: National Institute of Science and Technology Policy in the MEXT "Science and Technology Indicators 2024"
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00113>
 (Data collection)

B Number of researchers in our country

At the end of FY2023, the number of researchers in Japan (the total number of researchers in business enterprises, non-profit institutions and public organizations, universities and colleges) was 907,363 with the number of researchers in business enterprises being

523,548. Among the researchers in business enterprises, the number of researchers in the information and communications industry was 145,122 (27.7%), showing a decreasing trend in recent years (**Figure 2-1-1-13**).

Figure 2-1-1-13 Trend in the number of researchers in business enterprises

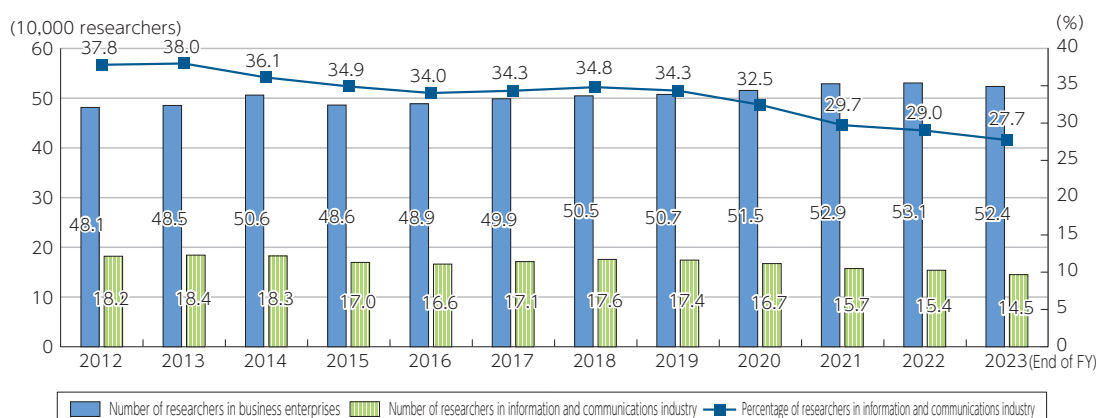
(Source) Prepared based on MIC "Survey of Research and Development"¹² for each FY¹²¹⁰ <https://www.stat.go.jp/data/kagaku/index.html>¹¹ Measured by converting research work into fulltime employment.¹² <https://www.stat.go.jp/data/kagaku/index.html>



Figure (related data) Percentage of the number of researchers at business enterprises by industry (as of March 31, 2024)

Source: Prepared based on MIC "2024 Survey of Research and Development"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00115>

(Data collection)

(3) Patent situation

The number of patent applications to the U.S. was 0.594 million in 2022. The proportion of applications from non-residents has been increasing in recent years, suggesting that the U.S. market is attractive to overseas entities. The number of applications to Japan was 0.290 million in 2022, ranking third in size after China and the U.S. However, the number of patent applications has

been decreasing since the mid-2000s, leading to a growing gap.

Looking at the proportion of patent families¹³ across technology fields in Japan, the U.S., and China, it is evident that the proportion of "Information and Communication Technology" is increasing in the U.S. and China, while it is stagnant in Japan.



Figure (related data) Changes in the patent application in major countries and from major countries

Source: National Institute of Science and Technology Policy in the MEXT "Science and Technology Indicators 2024"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00115>

(Data collection)

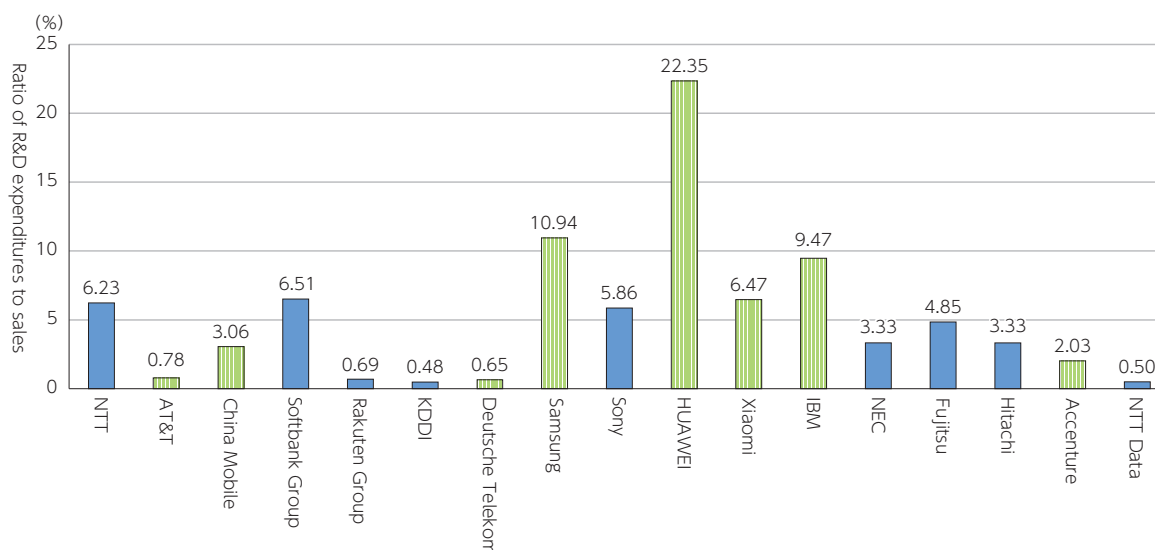
(4) Trends in research and development of major domestic and international companies in the ICT field

The ratio of research and development expenditures to sales in 2023 for major domestic and international information and communication-related companies remained below 10%, with the exception of some companies (Figure 2-1-1-15).

For major Japanese telecommunications companies, the ratio of research and development expenditures to

sales in 2023 was approximately 6 to 7% for NTT and Softbank Group, and less than 1% for KDDI and Rakuten Group, while GAFAM¹⁴ and BAT¹⁵, excluding Apple and Alibaba, had a ratio of approximately 10% to 30%, indicating their active commitment to research and development (Figure 2-1-1-16) (Figure 2-1-1-17).

Figure 2-1-1-15 Comparison of research and development expenditure by telecommunications carriers, communications devices and IT service providers (2023)



(Source) Prepared based on the "EU Industrial R&D Investment Scoreboard" and annual reports etc. by each company¹⁶

¹³ A patent family is a bundle of patent applications in two or more countries that are linked directly or indirectly by priority rights. Generally, patents with the same content that are filed in more than one country belong to the same patent family. Thus, counting patent families prevents the same application from being counted twice. In other words, the number of patent families is considered to be approximately the same as the number of inventions.

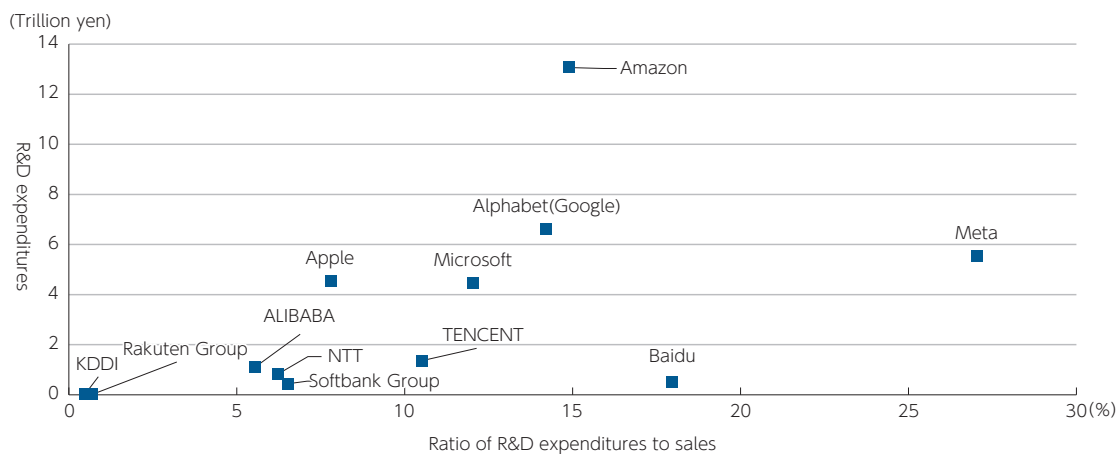
https://www.nistep.go.jp/sti_indicator/2024/RM341_46.html

¹⁴ Alphabet (Google), Amazon, Meta (facebook), Apple, Microsoft

¹⁵ Baidu, Alibaba, Tencent

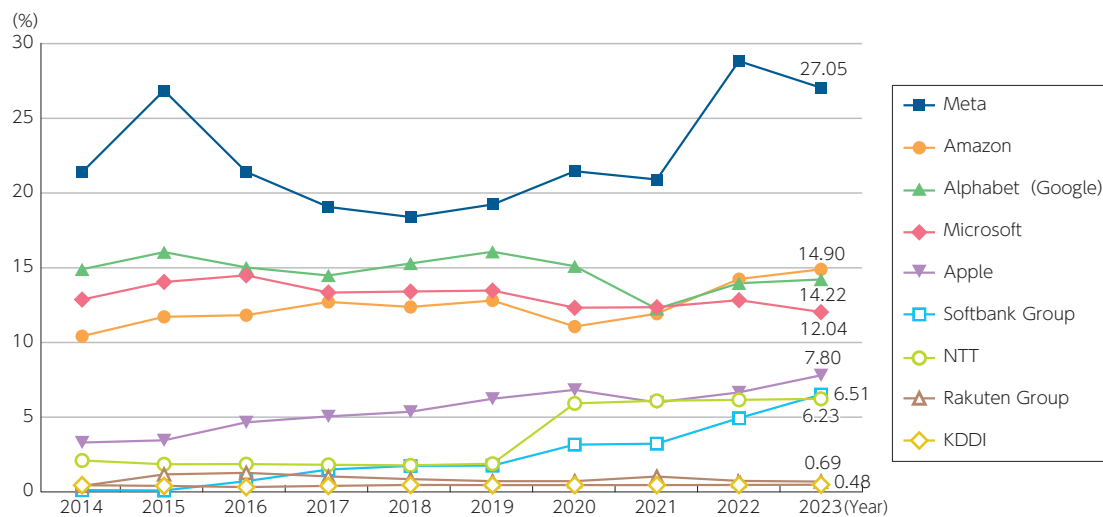
¹⁶ Note that a simple comparison cannot be made with the corresponding data contained in previous White Papers on Information and Communications in Japan because different data sources are used.

Figure 2-1-1-16 Comparison of research and development expenditure between major Japanese telecommunications carriers and GAFAM & BAT (2023)



(Source) Prepared based on the "EU Industrial R&D Investment Scoreboard" and annual reports etc. by each company¹⁷

Figure 2-1-1-17 Changes in the ratio of research and development expenditure to sales among major Japanese telecommunications carriers and GAFAM



(Source) Prepared based on the "EU Industrial R&D Investment Scoreboard"

¹⁷ Note that a simple comparison cannot be made with the corresponding data contained in previous White Papers on Information and Communications in Japan because different data sources are used.

Section 2 Trends in the telecommunications field

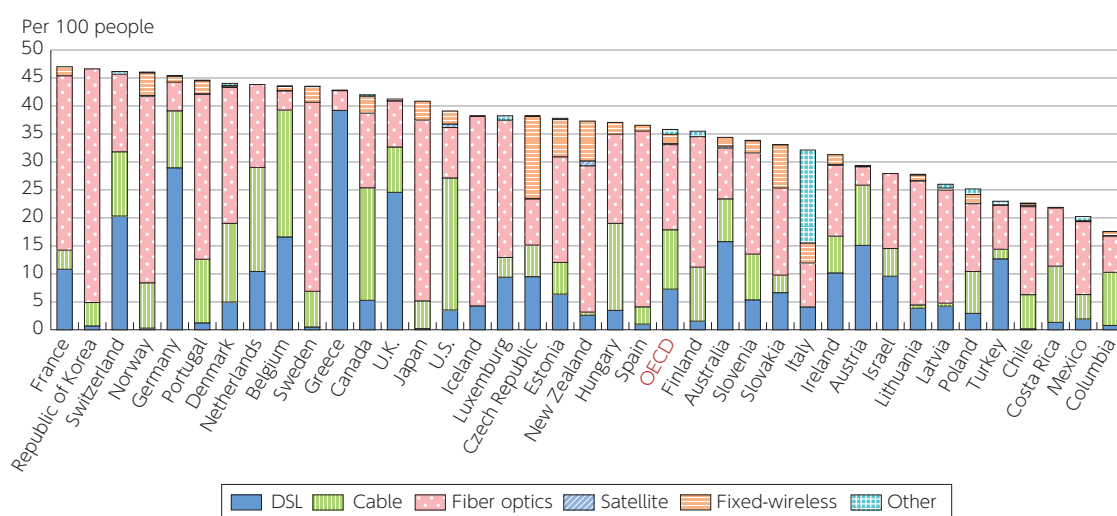
1. Trends in the domestic and overseas telecommunications market

According to OECD, France had the highest number of broadband service subscribers per 100 people (as of December 2023) with 47.0 contracts, followed by the Republic of Korea with 46.6 contracts and Switzerland with 46.2 contracts. Broadband services include DSL, cables, fiber optics (FTTH), satellites, fixed wireless, and others. Japan ranked in the 14th place with 40.8 contracts, exceeding the OECD average of 35.8 contracts (**Figure 2-1-2-1**).

In terms of mobile broadband service subscriptions

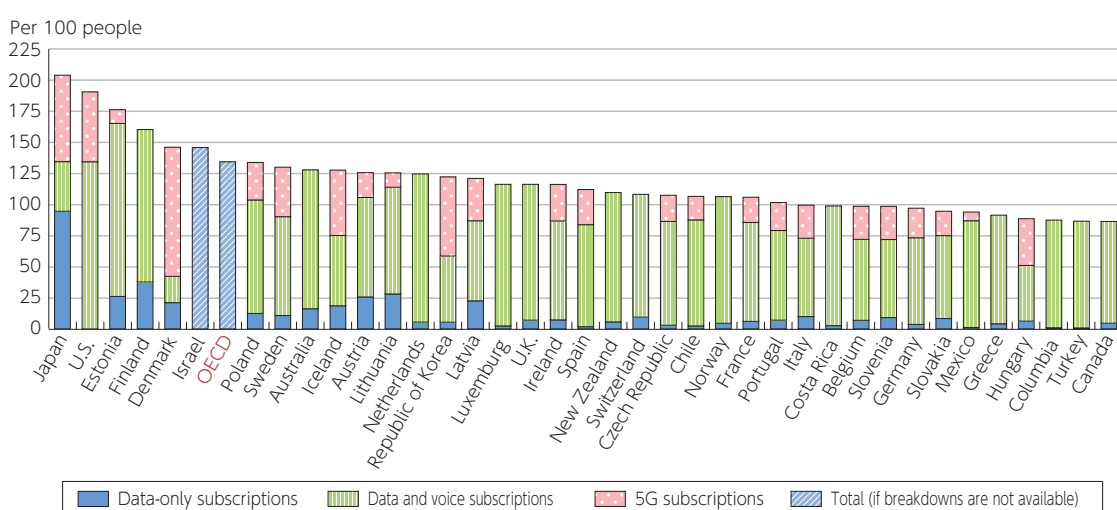
per 100 people, the largest number of subscriptions was in Japan (203.5 contracts). This was followed by the U.S. (190.1 contracts), Estonia (175.9 contracts), Finland (159.9 contracts), and Denmark (145.8 contracts). Among mobile broadband services, the number of 5G service subscriptions was the highest in Denmark with 103.6 contracts, followed by Japan with 69.4 contracts, and the Republic of Korea with 63.5 contracts (**Figure 2-1-2-2**).

Figure 2-1-2-1 Number of broadband service subscribers per 100 people



(Source) OECD¹

Figure 2-1-2-2 Number of mobile broadband service subscriptions per 100 people



(Source) OECD²

¹ OECD statistics. From OECD Broadband statistics <<https://www.oecd.org/en/topics/sub-issues/broadband-statistics.html>>, 1.2.1. OECD Fixed broadband subscriptions per 100 inhabitants, by technology, December 2023. Fiber optics include FTTH, FTTP and FTTB, but do not include FTTC and FTTN.

² OECD statistics. From OECD Broadband statistics <<https://www.oecd.org/en/topics/sub-issues/broadband-statistics.html>>, 1.2.2. OECD Mobile broadband subscriptions per 100 inhabitants, by technology, December 2023.

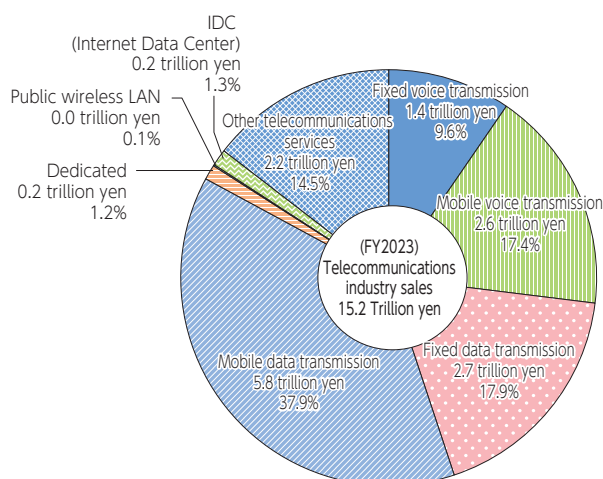
2. Current status of the telecommunications field in Japan

(1) Market size

The total revenue of the telecommunications industry for FY2023 is estimated to be approximately 15 trillion yen. Breaking it down, data transmission (both fixed and

mobile) accounts for about 8.5 trillion yen (55.9%), and voice transmission (both fixed and mobile) accounts for about 4.1 trillion yen (26.9%) (Figure 2-1-2-3).

Figure 2-1-2-3 Composition of sales in the telecommunications industry



*1 "Fixed voice transmission" is the sum of domestic and international services.

*2 "Fixed data transmission" includes sales through Internet access (ISP, FTTH etc.), IP-VPN and wide area Ethernet.

*3 The sales in the telecommunications industry does not match the sum of sales by service because some companies did not provide the figures for the sales by service.

*4 Due to rounding, the simple sum of the numbers in this graph does not match the numbers in the main text ("data transmission (both fixed and mobile)" and voice transmission (both fixed and mobile)) of this white paper.

(Source) Prepared based on MIC "Basic Survey on the Information and Communications Industry"³

(2) Number of carriers

As of the end of FY2024, the number of telecommunications carriers is 26,642 (339 registered carriers and

26,303 notified carriers), continuing the increasing trend from the previous year (Figure 2-1-2-4).

Figure 2-1-2-4 Changes in the number of telecommunications carriers

End of FY	2016	2017	2018	2019	2020	2021	2022	2023	2024
Number of telecommunications carriers	18,177	19,079	19,818	20,947	21,913	23,111	24,272	25,534	26,642

(Source) Information and Communications Statistics Database⁴

³ <https://www.soumu.go.jp/johotsusintokei/statistics/statistics07.html>

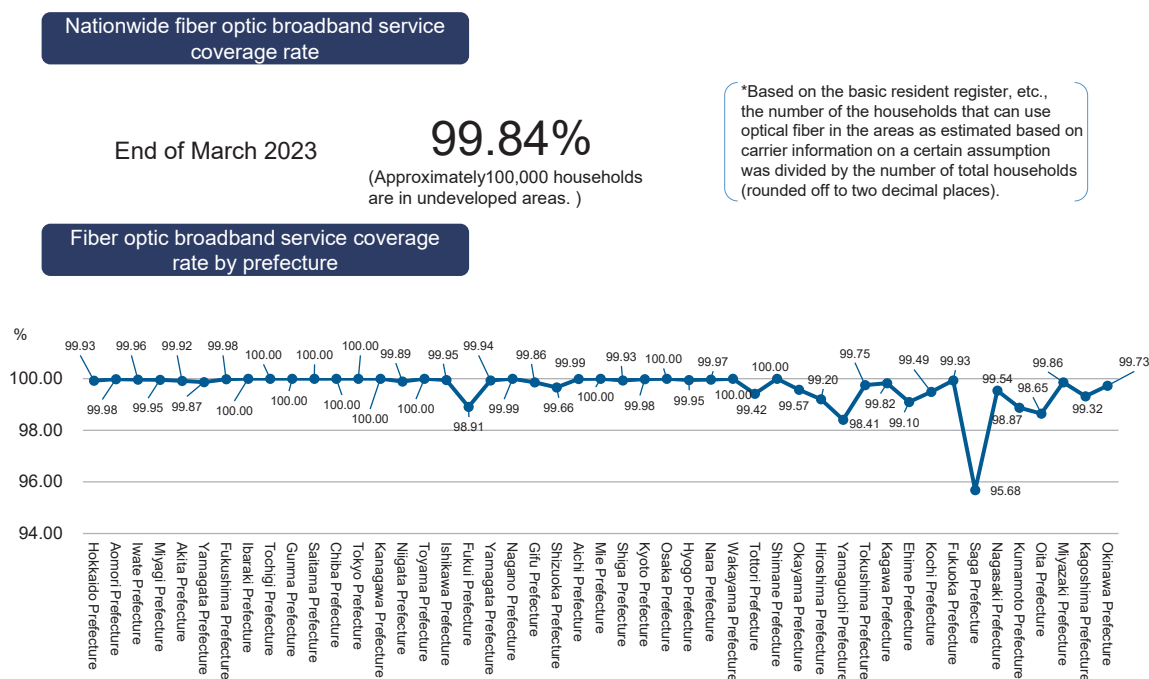
⁴ <https://www.soumu.go.jp/johotsusintokei/field/tsuushin04.html>

(3) Infrastructure development status

As of the end of FY2022, the national coverage rate for fiber optic broadband services (household coverage

rate) is 99.84% (Figure 2-1-2-5).

Figure 2-1-2-5 Fiber optic broadband service coverage rate in Japan (as of end of FY2022)



(Source) MIC "Survey on Broadband Infrastructure Coverage Rate at End of FY2022"⁵

According to the OECD, as of December 2023, the proportion of fiber optics in Japan's fixed broadband is

the fifth highest among the member countries.



Figure (related data) Percentage of optical fiber in fixed broadband in the OECD member countries

Source: OECD Broadband statistics. Percentage of fibre connections in total fixed broadband, December 2023

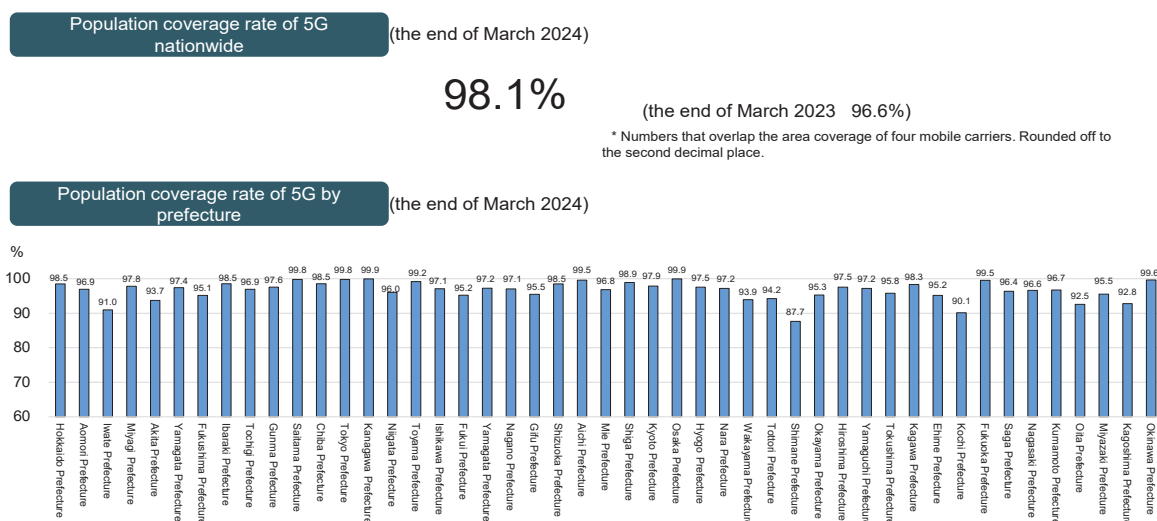
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00129>

(Data collection)

Additionally, as of the end of FY2023, the nationwide 5G population coverage rate in Japan is 98.1%, and all

prefectures have exceeded 85% (Figure 2-1-2-6).

Figure 2-1-2-6 Japan's 5G coverage as percentage of population (as of end of FY2023)



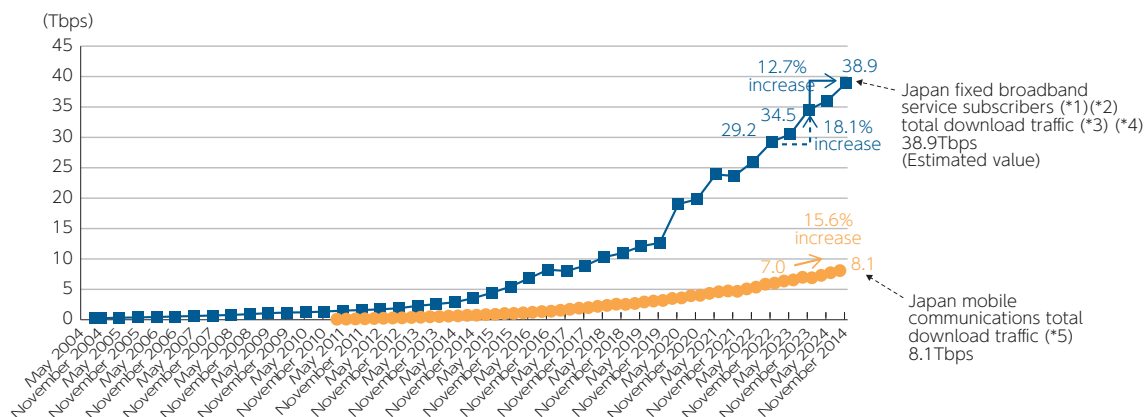
⁵ https://www.soumu.go.jp/menu_news/s-news/01kiban07_02000026.html

(4) The status of traffic

The total download traffic of fixed broadband service subscribers in Japan experienced a sharp increase after the outbreak of the COVID-19 pandemic. Subsequently, despite fluctuations in growth rates, it has generally continued to increase, reaching a 12.7% increase compared

with the same month of the previous year as of November 2024. The total download traffic for mobile communication also continues to increase, with a 15.6% increase compared with the same month of the previous year as of November 2024 (Figure 2-1-2-7).

Figure 2-1-2-7 Change in Internet traffic (fixed/mobile systems, download traffic)



*1 Services for individuals (FTTH, DSL, CATV, FWA)

*2 Including some corporations

*3 Up to May 2011, this also includes some mobile communications traffic to and from mobile phone networks

*4 Since May 2017, the number of cooperating ISPs increased from five to nine, resulting in discontinuities due to aggregated and estimated values based on information from the nine ISPs

*5 From "MIC Current State of Mobile Communications Traffic in Japan (Sept 2024)" (measured in March, June, Sept, and Dec)

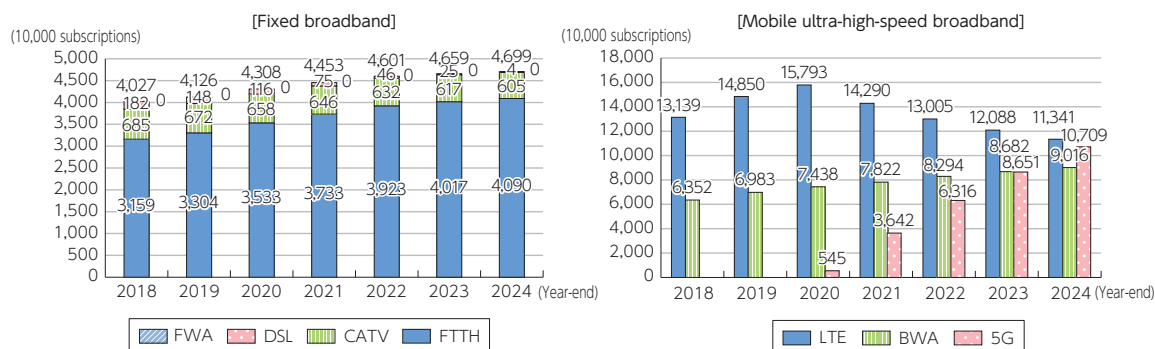
(Source) MIC (2025) "Results of Aggregating Internet Traffic in Japan (for November 2024)"⁶

(5) The status of use of broadband

As of the end of December 2024, the number of fixed broadband subscriptions⁷ was 46.99 million (a 0.9% increase from the same period of the previous year). Among the subscriptions for mobile ultra-high-speed broadband⁸, the number of 3.9-4th generation mobile phones (LTE) was 113.41 million (a 6.2% decrease from

the same period of the previous year), 5th generation mobile phones was 107.09 million (a 23.8 % increase from the same period of the previous year), and BWA was 90.16 million (a 3.8% increase from the same period of the previous year) (Figure 2-1-2-8).

Figure 2-1-2-8 Changes in the number of broadband subscriptions



*The figures of the past differ from those published last year due to revisions in business operator reports.

(Source) Prepared based on MIC "Publication of Quarterly Data on the Number of Subscriptions and Share of Telecommunications Services (Q3 of FY2024 (End of December))"⁹

⁶ https://www.soumu.go.jp/main_content/000992366.pdf

⁷ The number of fixed-line broadband subscription is the sum of the FTTH, CATV (limited to coaxial, HFC), DSL and FWA subscriptions.

⁸ This is the number of LTE, BWA and 5G subscriptions, and does not include 3G or PHS subscriptions.

⁹ https://www.soumu.go.jp/menu_news/s-news/01kiban04_02000255.html

(6) Satellite communications

Satellite communications utilize both geostationary satellites¹⁰ and non-geostationary satellites¹¹ to provide communication infrastructure in remote islands, mountainous areas, and for communication with ships and

aircraft, and during emergencies such as natural disasters, making use of advantages such as wide area coverage, simultaneous communications and disaster resistance.



Figure (related data) Major geostationary satellites used as communication services in Japan (as of end of FY2024)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00137>
(Data collection)



Figure (related data) Major non-geostationary satellites used as communication services in Japan (as of end of FY2024)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00138>
(Data collection)

(7) Status of voice communication service subscription contracts

As for the status of voice communication service subscription contracts, the number of fixed communication contracts (including NTT East/West subscribed telephone services (including ISDN), non-NTT telephone services¹², and CATV telephone services, excluding 0ABJ type IP phone services) has been declining in recent years, while the number of mobile communications contracts (mobile phones, PHS, and BWA) has been showing steady growth. As of the end of December 2024, the number of mobile communication contracts is approximately 17.3 times that of fixed communication contracts (**Figure 2-1-2-9**).

Furthermore, as of the end of December 2024, the

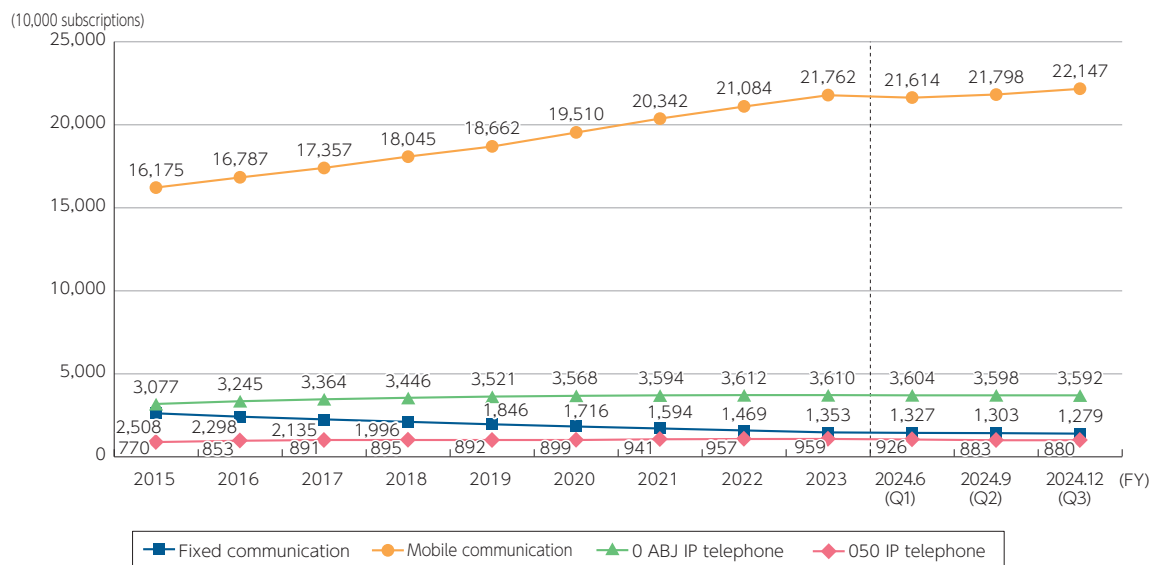
market share of mobile communication contracts by operator is as follows: NTT DOCOMO at 34.2% (a decrease of 0.9 percentage points from the same period of the previous year; 40.4% when including those provided to MVNO), KDDI Group at 27.1% (a decrease of 0.2 percentage points; 31.6% when including those provided to MVNO), SoftBank at 19.1% (a decrease of 0.3 percentage points; 24.2% when including those provided to MVNO), Rakuten Mobile at 3.2% (an increase of 0.5 percentage points; 3.8% when including those provided to MVNO), and MVNO at 16.3% (an increase of 0.9 percentage points) (**Figure 2-1-2-10**).

¹⁰ An artificial satellite that orbits the Earth at an altitude of approximately 36,000 kilometers above the equator, synchronized with the Earth's rotation. With three satellites, it is possible to cover the entire Earth except for the polar regions.

¹¹ These satellites orbit at lower altitudes than geostationary satellites. Due to their lower orbit, they have lower transmission delays compared with geostationary satellites, enabling high-speed, high-capacity communication, and also allowing communication in polar regions. However, because the satellites move across the sky in a short period of time, simultaneous operation of a large number of satellites is required.

¹² Non-NTT telephone services are subscribed telephone services by telecommunications carriers other than NTT East/West and includes direct subscriber telephone, ISDN services, new-type non-NTT telephone and ISDN services.

Figure 2-1-2-9 Changes in the number of subscriptions to voice communications services



*1 For FY2024, data up to the end of December was used, so care must be taken when making year-on-year comparisons.

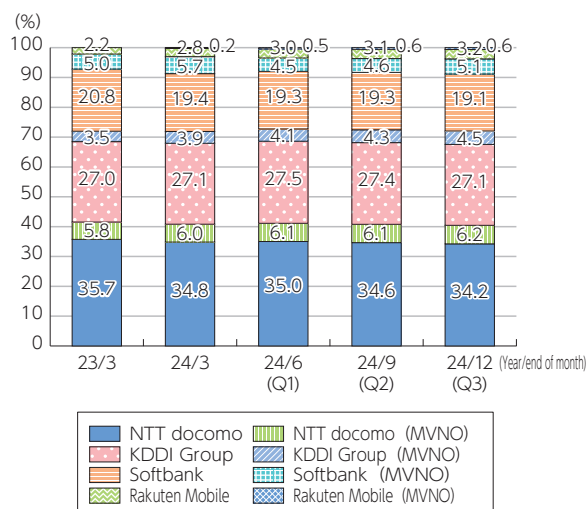
*2 The number of mobile communications subscriptions is the sum of mobile phones, PHS and BWA subscriptions.

*3 The number of mobile communication subscriptions, unless otherwise specified, refers to the figures "after intra-group transaction adjustments." "After intra-group transaction adjustments" means that when an MNO provides mobile phone or BWA services received from another MNO within the same group in the capacity of an MVNO, along with its own services, it is counted as one subscription instead of two.

*4 The reporting of MVNO service-specific subscription numbers was added from the fourth quarter of the FY2015, resulting in differences in the calculation methods for the adjusted subscription numbers before the fourth quarter of the FY2014 and after the fourth quarter of the FY2015.

(Source) MIC "Publication of Quarterly Data on the Number of Subscriptions and Share of Telecommunications Services (Q3 of FY2024 (End of December))"¹³, "Publication of Quarterly Data on the Number of Subscriptions and Share of Telecommunications Services (Q4 of FY2021 (End of March))"¹⁴, and "Information and Communications Statistics Database-Number of Subscriptions"¹⁵

Figure 2-1-2-10 Changes in share of mobile communications subscriptions (adjusted for intra-group transactions) by operator



*1 The number of mobile communication subscriptions, unless otherwise specified, refers to the figures "after intra-group transaction adjustments," and does not include subscriptions for wireless fixed broadband services provided via mobile phones or BWA or subscriptions for mobile network fixed telephone and wireless fixed telephone services. "After intra-group transaction adjustments" means that when an MNO provides mobile phone or BWA services received from another MNO within the same group in the capacity of an MVNO, along with its own services, it is counted as one subscription instead of two.

*2 Up to the fourth quarter of FY2022 (23/3), the number of mobile communications subscriptions includes subscriptions for wireless fixed broadband services provided via mobile phones or BWA.

*3 The share of the KDDI Group includes KDDI Okinawa Cellular and UQ Communications.

*4 The share of MVNO is calculated by MNO group that provides services and is indicated by the supplementary note (MVNO) after the name of the MNO group.

*5 Rakuten Mobile's share as an MNO. MVNO services provided by Rakuten Mobile are included in NTT docomo (MVNO) and KDDI Group (MVNO).

(Source) Prepared from MIC "Publication of Quarterly Data on the Number of Subscriptions and Share of Telecommunications Services (Q3 of FY2024 (End of December))"

¹³ https://www.soumu.go.jp/menu_news/s-news/01kiban04_02000255.html

¹⁴ https://www.soumu.go.jp/menu_news/s-news/01kiban04_02000206.html

¹⁵ <https://www.soumu.go.jp/johotsusintokei/field/tsuushin02.html>

(8) International comparison of communication charges

When comparing communication charges in Tokyo (Japan), New York (the U.S.), London (the UK), Paris (France), Dusseldorf (Germany), and Seoul (the Republic of Korea) as of March 2025, the smartphone (4G, for the leading MNO, for new contracts) fees in Tokyo were

at a median level.

The fees for fixed-line telephones, including basic fees and the cost of a 3-minute local call at 12:00 on weekdays, were also at a median level.



Figure (related data) International comparison of mobile phone charges by model (FY2024)
Source: MIC “FY2024 Survey on Domestic-Overseas Price Difference of Telecommunications Service”
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00149>
(Data collection)



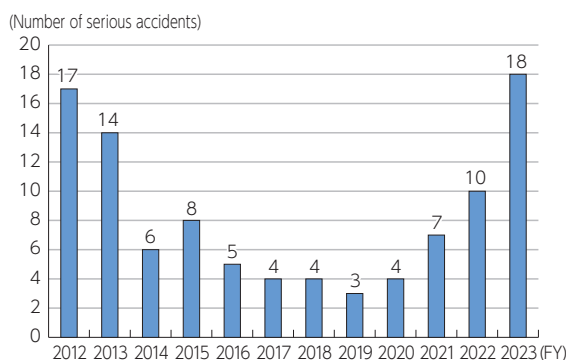
Figure (related data) International comparison of fixed telephone charges based on individual charges (FY2024)
Source: MIC “FY2024 Survey on Domestic-Overseas Price Difference of Telecommunications Service”
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00150>
(Data collection)

(9) Status of occurrence of telecommunications service accidents

In FY2023, there were 7,261 reported accidents requiring quarterly reports, of which 18 were classified as

serious accidents¹⁶. This represents an increasing trend since FY2019 (**Figure 2-1-2-11**).

Figure 2-1-2-11 Changes in the number of serious accidents



(Source) MIC “Verification Report on Telecommunications Accidents in FY2023”¹⁷

(10) Complaints and consultations regarding telecommunications services and consultations on illegal and harmful information

A Complaints and Consultations Regarding Telecommunications Services

In FY2024, the number of complaints and consultations regarding telecommunications services received by the MIC was 9,970, which represents a decrease from the previous fiscal year (**Figure 2-1-2-12**). Additional-

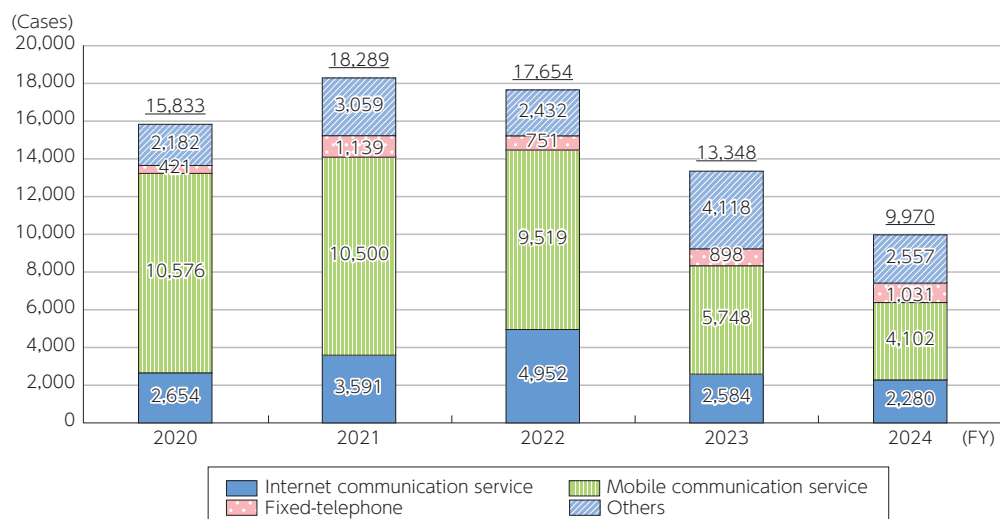
ly, when looking at the details of complaints and consultations received by consumer centers nationwide and the MIC by service type, those related to “MNO services” were the highest (**Figure 2-1-2-13**).

¹⁶ Accidents falling under the Article 28 of the Telecommunications Business Act “When a serious accident specified by an Ordinance of the Ministry of Internal Affairs and Communications has occurred with respect to telecommunications activities, (the telecommunications carrier) shall report without delay to the Minister for Internal Affairs and Communications to that effect including its reason or cause.”

¹⁷ https://www.soumu.go.jp/menu_news/s-news/01kiban05_02000340.html

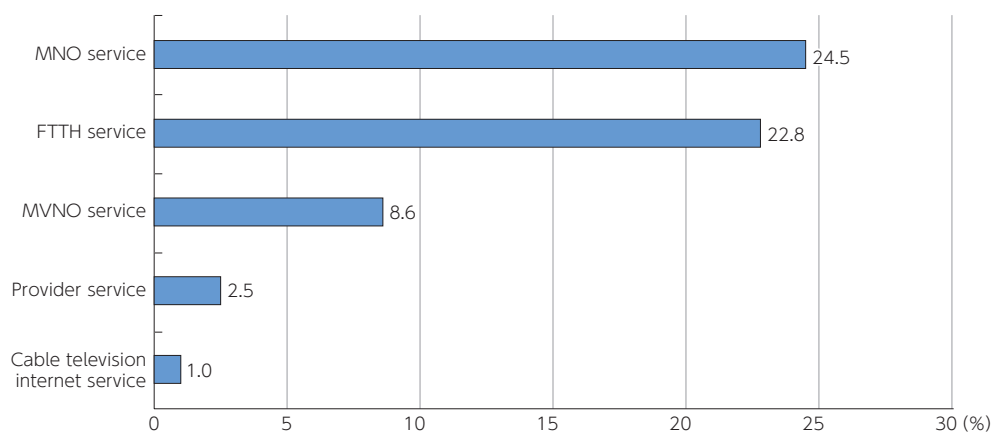
* The number of reports from business operators. With regard to serious accidents, from FY2008, a decline in the quality of a telecommunications service is also classified as a serious accident, and from FY2015, reporting standards have been set for each category of telecommunications service, rather than uniformly for telecommunications services, so changes from year to year cannot be simply compared.

Figure 2-1-2-12 Changes in the number of complaints and inquiries received by the MIC



(Source) Prepared by MIC

Figure 2-1-2-13 Breakdown of complaints and consultations received by consumer centers nationwide and the MIC (random sample of those received between April 2023 and March 2024)



* There is a possibility that ISP services provided together with FTTH lines are only included in provider services.

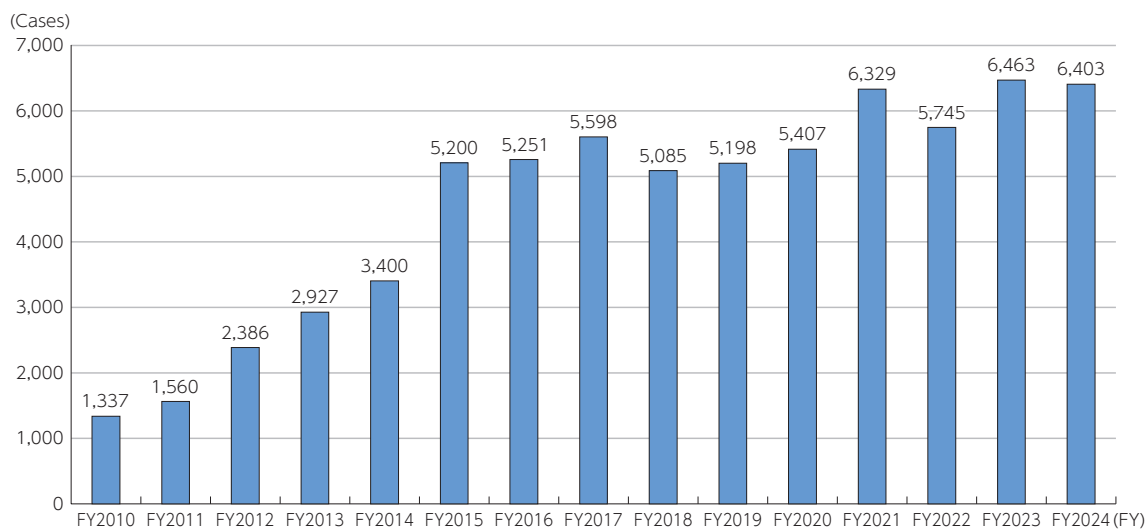
(Source) MIC "Regular Meeting for Monitoring the Implementation Status of Consumer Protection Rules (17th meeting)"

B Consultations on illegal and harmful information

The number of consultations received by the Illegal and Harmful Information Consultation Center, which is operated under the commission of the MIC, has remained high, with 6,403 consultations in FY2024 (**Fig-**

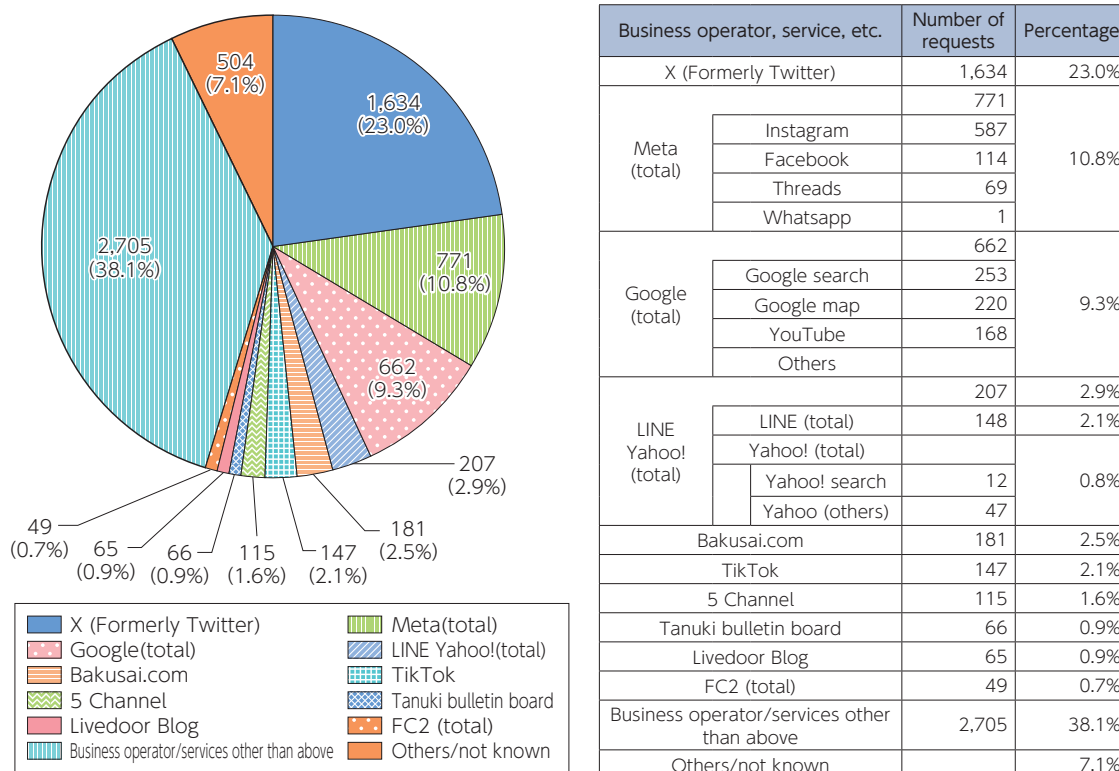
ure 2-1-2-14). The top five companies for the number of consultations in FY2024 were X (formerly Twitter), Meta, Google, LINE Yahoo, and Bakusai (**Figure 2-1-2-15**).

Figure 2-1-2-14 Changes in the number of consultations regarding illegal and harmful information



(Source) MIC "Regular Monitoring Meetings on the Implementation Status of Consumer Protection Rules (17th meeting)"

Figure 2-1-2-15 Breakdown of the number of consultations provided at the Illegal Harmful Hotline by business operator



*1 The number of consultations is based on the collected cases; the consultation center did not determine if each case constitutes an infringement of rights.

*2 The number of consultations (6,430) may not match the total number of consultations in the chart above (7,106), because respondents may have chosen multiple services.

*3 The data provided in the above chart cannot precisely be considered statistical information, because, depending on consultations, respondents may have chosen the same service for multiple times.

*4 Unique domains are used in some cases, which makes it difficult to identify the actual domain.

(Source) MIC "Regular Monitoring Meetings on the Implementation Status of Consumer Protection Rules (17th meeting)"

3. New trends in the communications field

(1) All photonics network

All photonics network technology is a core technology for next-generation information and communication infrastructure. By utilizing photonics-electronics convergence

technology in wired networks and information and communications equipment and devices, and minimizing electrical-to-optical signal conversion, it enables low pow-

er consumption, low latency, and large capacity, making it a potential game changer. Its primary use case is high-speed, low-latency interconnection between data centers. In line with recent trends, integration with generative AI technologies is also progressing. NTT Communications Corporation successfully achieved the world's first large language model (LLM) training demonstration experiment in an environment with distributed GPU servers located across three datacenters connected via photonics-electronics convergence¹⁸. The high-speed, low-latency connections enabled by photonics-electronics convergence allow rapid and efficient data transfer between GPU servers, delivering performance on par with that of

a single datacenter for relatively light processing, such as pre-training and additional training of small-scale AI models. This will unlock the potential to flexibly build GPU clusters across multiple data center environments, thereby enabling more efficient resource utilization.

Furthermore, utilizing all photonics networks is expected to accelerate the decentralization of datacenter locations, which are currently concentrated in metropolitan areas, to areas where renewable energy is available. This, in turn, is expected to strengthen Japan's AI development capabilities, promote the use of AI, and provide safe, secure, and reliable AI with low environmental impact (green AI) across society.

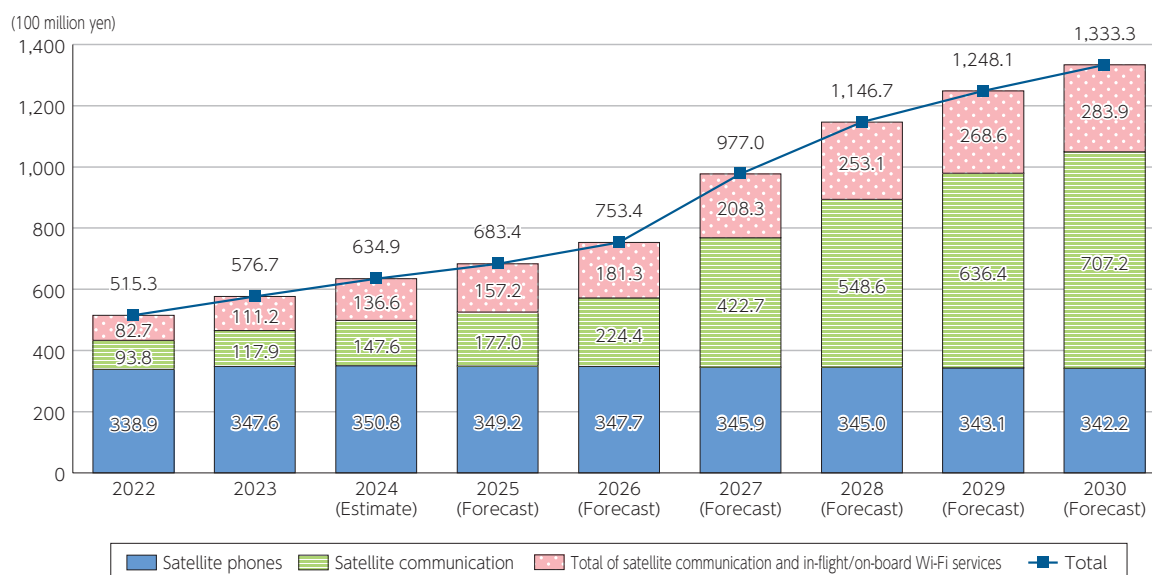
(2) Non-Terrestrial Network (NTN)

Non-Terrestrial Network (NTN) refers to a multi-layered mobile communication network that connects not only terrestrial areas but also the sea, sky, and space. By using HAPS (High Altitude Platform Station) and satellite communications, it allows for seamless communication services even in areas where terrestrial communi-

cation infrastructure is not developed.

The domestic satellite communications service market is expected to reach 57.7 billion yen in 2023 and 63.5 billion yen in 2024 (a 10.1% increase from the previous year), and is expected to continue to grow thereafter (Figure 2-1-2-17).

Figure 2-1-2-17 Changes and forecasts of the size of the domestic satellite communications service market



* The market size includes: 1) satellite phones and satellite data communication services provided by telecommunications carriers using GEO (geostationary satellites)/MEO (medium earth orbit satellites), LEO (low earth orbit satellite constellations), and HAPS; 2) in-flight and on-board Wi-Fi services provided by service providers (public transportation operators: airplanes, passenger ships, etc.); and 3) direct satellite communication services via smartphones. Broadcast network services such as BS/CS broadcasting and J-ALERT are not included.

(Source) Yano Research Institute Ltd., "Satellite Communication Service Market in Japan: Key Research Findings 2024" (published on March 24, 2025)¹⁹

(3) Quantum cryptographic communication

Quantum cryptographic communication is a secure encryption key distribution technology that utilizes quantum properties to address the threat of cryptography being compromised by the realization of quantum computers, and is attracting growing interest both in Japan and overseas.

China has developed and begun using a nationwide quantum cryptographic communication network spanning over 10,000 kilometers. Similarly, Europe has also begun building a large-scale quantum cryptographic com-

munication network spanning the entire continent, accelerating the efforts toward its social implementation.

In Japan, the MIC and the National Institute of Information and Communications Technology (NICT) have been promoting research and development on quantum cryptographic communication, and established a quantum cryptographic communication testbed called the "Tokyo QKD Network" in 2010 to demonstrate and verify quantum cryptographic communication, which has been in continuous operation since then.

¹⁸ <https://www.ntt.com/about-us/press-releases/news/article/2025/0319.html>

¹⁹ https://www.yanoresearch.com/en/press-release/show/press_id/3611

Section 3 Trends in the broadcasting and content field

1. Broadcasting

(1) Size of the broadcasting market

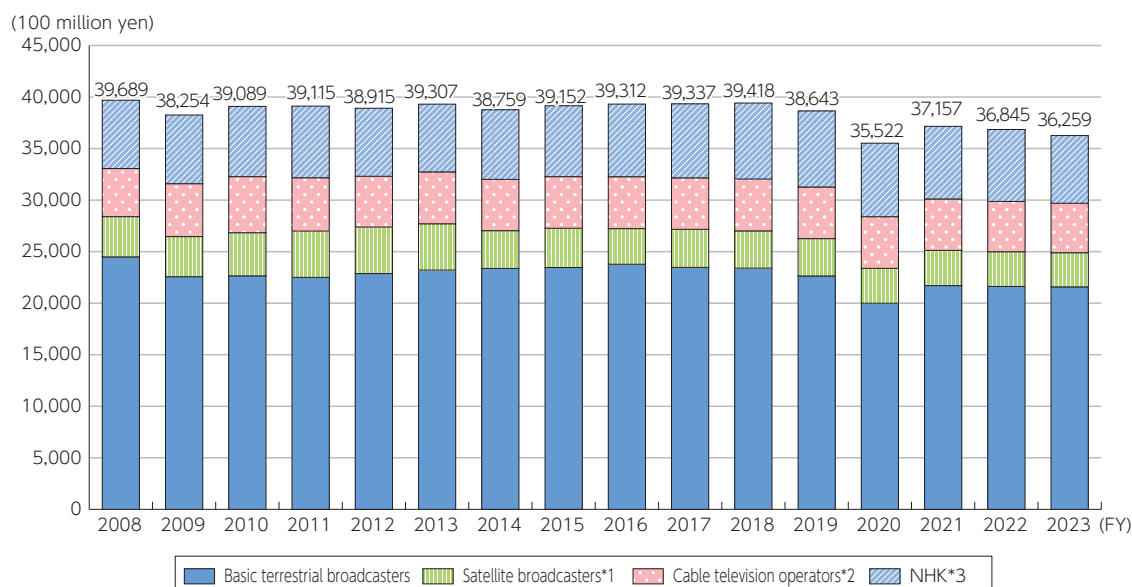
A Revenue of broadcasters

In Japan, broadcasting is conducted under a dual system consisting of NHK, which is funded by receiving fees, and private broadcasters, which are funded by advertising revenue or subscription fees for paid broadcasting. Additionally, the Open University of Japan Foundation broadcasts for educational purposes.

The total revenue of all broadcasters, including both broadcasting and non-broadcasting income, decreased from FY2022, amounting to 3.6259 trillion yen in FY2023, a 1.6% decrease from the previous fiscal year.

Breaking it down, the total revenue of private basic terrestrial broadcasters was 2.1582 trillion yen (a 0.2% decrease from the previous fiscal year), the total revenue of private satellite broadcasters was 331.5 billion yen (a 1.6% decrease from the previous fiscal year), the total revenue of cable television operators was 479.5 billion yen (a 1.7% decrease from the previous fiscal year), and NHK's operating revenue was 656.7 billion yen (a 5.8% decrease from the previous fiscal year) (Figure 2-1-3-1).

Figure 2-1-3-1 Changes in the size of the broadcasting industry market (total sales) and market breakdown



*1 Calculated based on operating revenues related to the satellite broadcasting business.

*2 Up to FY2010, cable TV operators were commercial corporations that conducted independent broadcasting using facilities approved under the former Cable Television Broadcasting Act (including facilities registered under the former Broadcasting Act for Use of Telecommunications Services that uses a broadcasting system equivalent to the facilities), and from FY2011, cable television operators are registered general broadcasters (limited to commercial corporations) that conduct independent broadcasting using cable telecommunications equipment (with both excluding operators using the IP multicast method).

*3 NHK's value is ordinary business income.

*4 Community broadcasters who are also engaged in cable television are excluded.

(Source) Prepared based on MIC "Income and Expenditures of Private Broadcasters" and NHK "Financial Statements" for each FY

Additionally, the advertising expenses for private basic terrestrial broadcasters in 2024 amounted to 1.7513 trillion yen, with 1.6351 trillion yen related to television

broadcasting and 116.2 billion yen related to radio broadcasting¹.



Figure (related data) Changes in advertising expenditures of private basic terrestrial broadcasters

Source: Prepared based on Dentsu "Advertising Costs in Japan"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00164>

(Data collection)

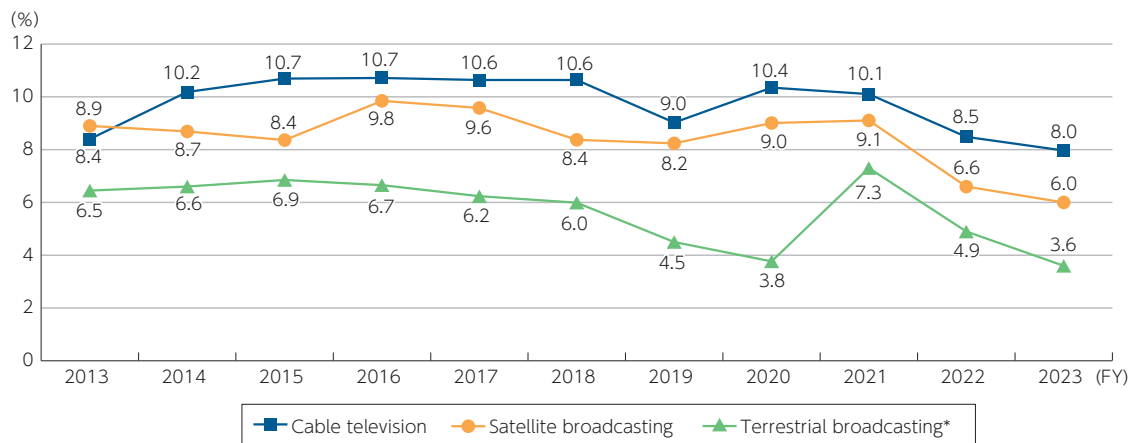
¹ Regarding the entire advertising market, refer to "2 Advertising" in, Part 2, Chapter 1, Section 3, Item 2(2) "Advertising."

B Financial status of private broadcasters

Looking at each category as a whole, private basic terrestrial broadcasters (with an operating profit margin of 3.6% in FY2023), private satellite broadcasters (6.0% in

the same period), and cable television operators (8.0% in the same period) all continued to secure profits in FY2023, following FY2022 (**Figure 2-1-3-2**).

Figure 2-1-3-2 Changes in the operating profit margin of private broadcasters



* Basic terrestrial broadcasting excluding community broadcasting

(Source) Prepared based on MIC "Income and Expenditures of Private Broadcasters" for each FY, etc.

(2) Number of operators

As of the end of FY2024, the breakdown of the number of private broadcasters is as follows: 540 companies for private basic terrestrial broadcasters (including 346

companies conducting community broadcasting) and 39 private satellite broadcasters (**Figure 2-1-3-3**).

Figure 2-1-3-3 Changes in the number of private broadcasters

End of FY			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Terrestrial	Television broadcasting (single operation)	VHF	16														
		UHF	77	93	93	94	94	98	94	94	95	95	95	96	96	96	96
	Radio broadcasting (single operation)	Medium-wave (AM) broadcasting	13	13	13	14	14	14	14	14	15	15	15	16	16	16	16
		Ultrashort wave (FM) broadcasting	298	307	319	332	338	350	356	369	377	384	384	388	390	393	396
		Community broadcasting of the above	246	255	268	281	287	299	304	317	325	332	334	338	339	342	346
		Short wave	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Television/radio broadcasting (combined operation)		34	34	34	33	33	33	33	33	32	32	32	31	31	31	31
	Text broadcasting (single operation)		1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Multimedia broadcasting				1	1	1	4	4	4	6	6	2	2	0	0	0
	Subtotal		440	449	461	475	481	500	502	515	526	533	529	534	534	537	540
Satellite	Basic satellite broadcasting	BS broadcasting	20	20	20	20	20	20	19	19	22	22	20	22	21	21	20
		110 degrees east longitude CS broadcasting	13	13	22	23	23	23	23	20	20	20	20	20	20	20	20
	General satellite broadcasting		91	82	65	45	7	5	4	4	4	4	4	4	4	3	2
	Subtotal		113	108	92	72	46	44	41	39	41	41	39	42	42	41	39
Cable television	General cable broadcasting pertaining to registration (limited to operators of independent broadcasting)	Broadcasting using former authorized facilities (limited to operators of independent broadcasting)	502														
		Broadcasting using former cable services under the former Act Concerning Broadcast on Telecommunications Services	26														
		IP multicast broadcasting of the above	5	5	4	3	3	3	5	5	5	5	5	4	3	3	—
	Subtotal		528	556	545	539	520	510	508	504	492	471	464	464	456	452	—

*1 The number of television broadcasters (single operation) at the end of FY2015 includes five operators conducting basic terrestrial broadcasting for mobile reception (one of them concurrently operated basic terrestrial broadcasting).

*2 Regarding satellite broadcasters, BS broadcasting and 110 degrees east longitude CS broadcasting are counted as basic satellite broadcasting, while other satellite broadcasting is counted as general satellite broadcasting based on the Broadcast Act amended and enforced in June 2011.

*3 Because some of the satellite broadcasters concurrently operate more than one of “BS broadcasting,” “110 degrees east longitude CS broadcasters” and “general satellite broadcasting,” sum of the values of the columns does not agree with the value of subtotal. Only operating broadcasters are included in FY2011 and after.

*4 Regarding cable television operators, up to FY2010, former approved facilities operators under the former Cable Television Broadcast Act and registered operators under the former Act Concerning Broadcast on Telecommunications Services were included, and from FY2011, registered general broadcasters conducting independent broadcasting using cable telecommunications facilities under the Broadcast Act are included (regarding IP multicast broadcasting, up to FY2010, it was included in former broadcasting using cable services, and from FY2011 it has been included in registered general broadcasters conducting independent broadcasting using cable telecommunications facilities).

(Source) Prepared based on MIC “Current State of Cable Television”² (only the values for cable TV operators)

(3) Status of the provision of broadcasting service

A Terrestrial television broadcasting

As of the end of FY2024, there are 127 companies nationwide (including 31 companies with dual operations) conducting terrestrial private television broadcasting.



Figure (related data) Number of available private television broadcasting channels (as of end of FY2024)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00167>

(Data collection)

B Terrestrial radio broadcasting

For AM broadcasting, 47 private basic terrestrial broadcasters (as of the end of FY2024) are conducting broadcasts.

For FM broadcasting, 396 private basic terrestrial broadcasters (as of the end of FY2024) are conducting broadcasts. Among these, there are 346 community

broadcasters, which generally target specific areas within a single municipality.

For shortwave broadcasting, one private basic terrestrial broadcaster (as of the end of FY2024) is conducting broadcasts.

C Multimedia broadcasting

As of the end of FY2024, there are no operators conducting V-Low multimedia broadcasting, which utilizes

the frequency band of 99MHz-108MHz made available by the digitalization of terrestrial television broadcasting.

² https://www.soumu.go.jp/main_content/000975399.pdf

D Satellite broadcasting

(A) Basic satellite broadcasting

For BS broadcasting, NHK, the Open University of Japan, and private broadcasters (20 companies as of the end of FY2024) are conducting broadcasts using artificial satellites operated by Broadcasting Satellite System Corporation, with 9 of these companies conducting

4K/8K satellite broadcasting. Additionally, for CS broadcasting at 110 degrees east longitude, private broadcasters (20 companies as of the end of FY2024) are conducting broadcasts using satellites operated by SKY Perfect JSAT Corporation.

(B) General satellite broadcasting

For general satellite broadcasting, private broadcasters (2 companies as of the end of FY2024) are conduct-

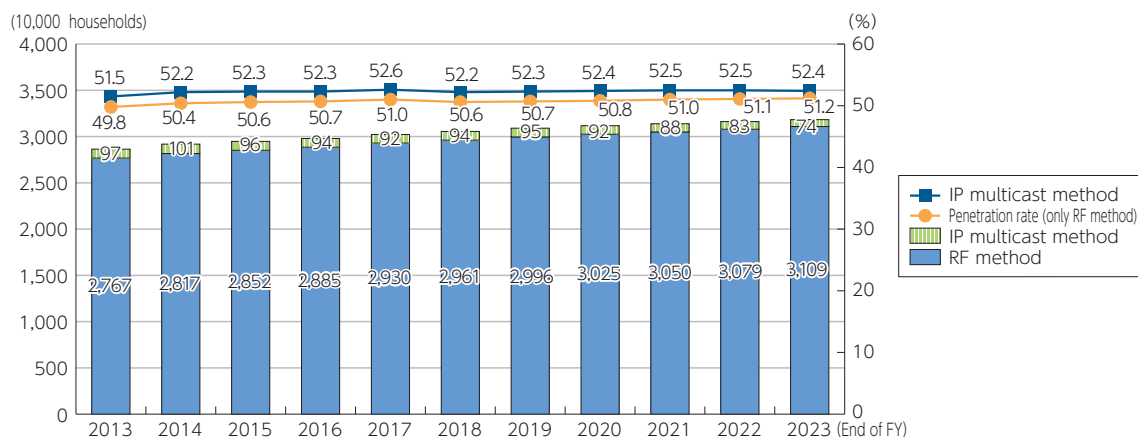
ing broadcasts using satellites operated by SKY Perfect JSAT Corporation.

E Cable television

As of the end of FY2023, there were 452 cable television operators. Cable television provides multi-channel broadcasting, including retransmission of terrestrial and satellite broadcasting as well as independent broadcasting channels. The number of households receiving

services through wired telecommunications facilities (with 501 or more terminals) for conducting independent broadcasting is approximately 31.84 million households, with a household penetration rate of approximately 52.4% (Figure 2-1-3-4).

Figure 2-1-3-4 Changes in the number of subscribed households and penetration rate for receiving services from cable telecommunications equipment that provide independent broadcasting as per their registration



*1 The penetration rate is calculated from the number of households in the Basic Resident Register.

*2 "The number of subscribed households" means the total number of households (including the number of households with radio interference) connected to the cable telecommunications equipment as per their registration.

(Source) Prepared based on MIC "Current State of Cable Television"³

(4) Status of NHK

A Domestic broadcasting by NHK

As of the end of FY2024, NHK's domestic broadcasting channels include 2 terrestrial television channels, 3

radio channels, and 3 satellite television channels.



Figure (related data) Domestic broadcasting of NHK (as of end of FY2024)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00170>
(Data collection)

B International television and radio broadcasting by NHK

NHK's international television and radio broadcasts are aimed at Japanese expatriates and foreigners, cover-

ing almost the entire world.



Figure (related data) Status of international television and radio broadcasting by NHK (plan as of April 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00171>
(Data collection)

³ https://www.soumu.go.jp/main_content/000975399.pdf

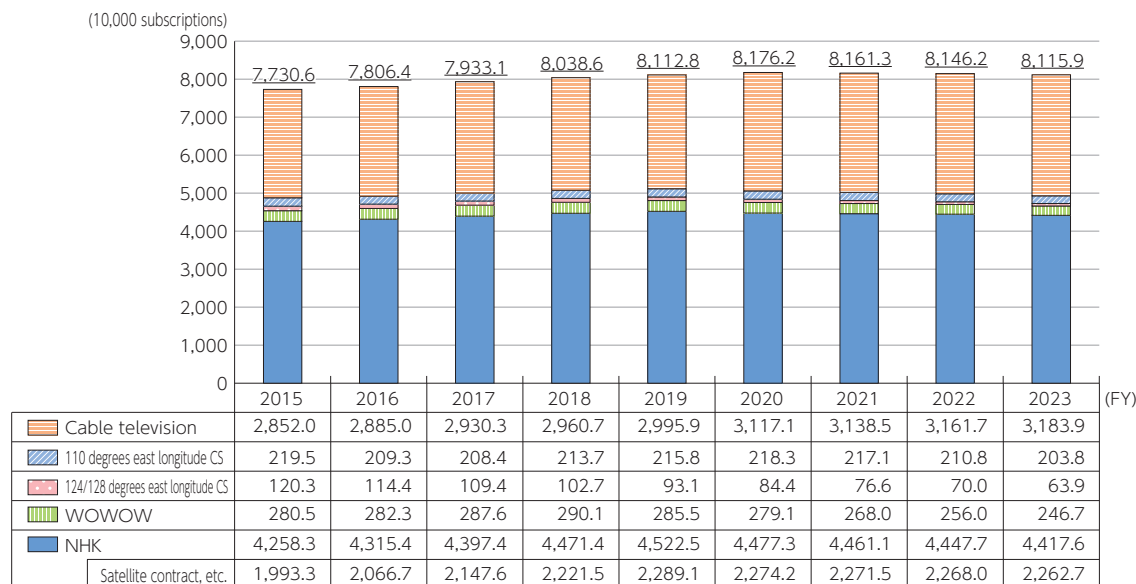
(5) Utilization of broadcasting services

A Number of subscribers

In FY2023, the number of subscribers to broadcasting services increased for cable television, while it de-

creased for other broadcasting services (Figure 2-1-3-5).

Figure 2-1-3-5 The number of subscribers to broadcasting services



*1 The number of subscribers to terrestrial broadcasting (NHK) is the number of NHK subscriptions of all subscription types.

*2 The number of subscribers to satellite contracts, etc. is the number of NHK satellite contracts and special contracts.

*3 The number of WOWOW subscribers is the number of WOWOW subscriptions.

*4 The number of subscribers of 124/128 degrees east longitude CS is the number of Sky Perfect! premium service subscriptions.

*5 The number of subscribers of 110 degrees east longitude CS is the number of Sky Perfect! subscriptions.

*6 The number of households subscribed to cable television is the number of households subscribed to cable telecommunications equipment that carry out independent broadcasting as per their registration.

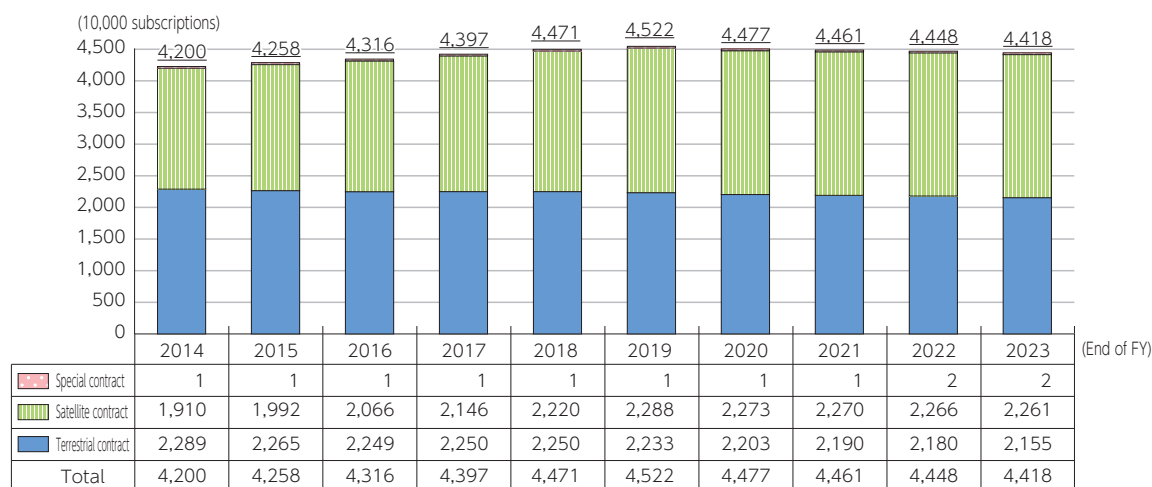
(Source) Prepared based on material from the Japan Electronics and Information Technology Industries Association, Japan Cable Laboratories, and NHK, and the MIC "Current State of Satellite Broadcasting" and "Current State of Cable Television"

B The number of NHK receiving contracts

As of FY2023, the number of NHK receiving contracts was approximately 44.18 million. Of these, terrestrial contracts (including standard and color contracts) ac-

counted for about 21.55 million, satellite contracts for about 22.61 million, and special contracts for about 0.02 million (Figure 2-1-3-6).

Figure 2-1-3-6 Changes in the number of subscribers of NHK



(Source) Prepared based on NHK's materials.

(6) Ensuring the safety and reliability of broadcasting equipment

Broadcasting serves as a highly important public utility, providing essential information for daily life and criti-

cal information such as disaster alerts instantaneously and widely. Therefore, the broadcasting equipment that

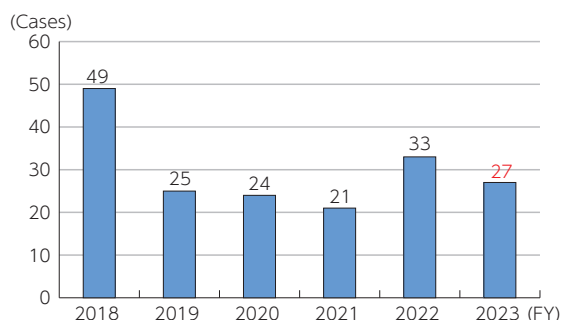
supports this service must meet high standards of safety and reliability.

In FY2023, there were 344 incidents of broadcasting interruptions, of which 27 were classified as major incidents⁴, accounting for approximately 8% of the total (Figure 2-1-3-7). In response, measures to prevent recurrence of such incidents are being rigorously implemented by each broadcaster, and efforts to share incident cases within the industry are being promoted to prevent similar incidents.

try are being promoted to prevent similar incidents.

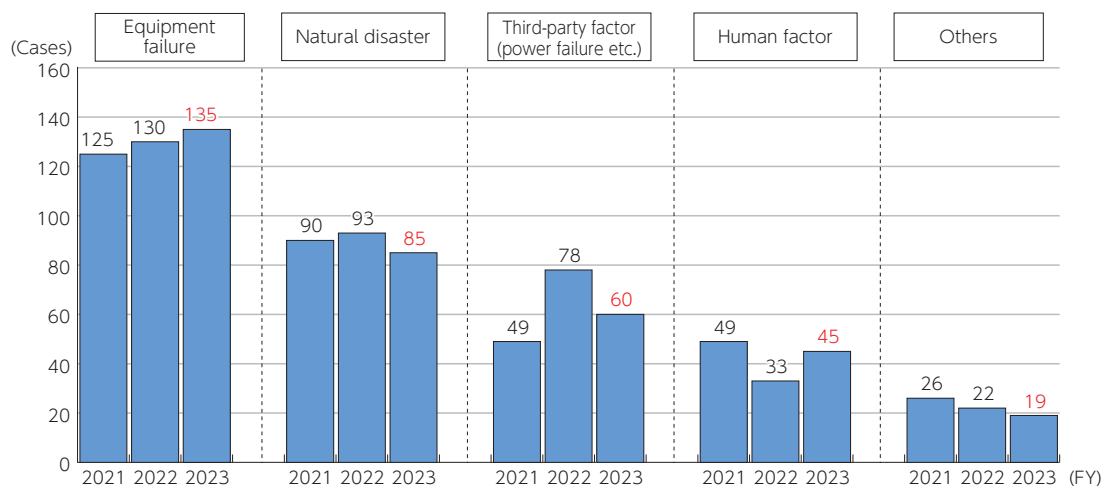
The number of broadcasting interruption incidents for terrestrial and satellite broadcasting was 255, the lowest since the start of data collection in FY2011. The number of incidents for general cable broadcasting was 89, showing a decreasing trend. The most common cause of broadcasting interruptions was equipment failure, followed by natural disasters (Figure 2-1-3-8).

Figure 2-1-3-7 Changes in the number of serious accidents



(Source) Prepared based on MIC "State of the Occurrence of Broadcasting Suspension Accidents"⁵ (FY2023)

Figure 2-1-3-8 Changes in the number of broadcasting suspension accidents by cause



(Source) Prepared based on MIC "State of the Occurrence of Broadcasting Suspension Accidents"⁶ (FY2023)

2. Content market

(1) Size of Japan's content market

A Market overview

The size of Japan's content market in 2023 was 12.5833 trillion yen. In terms of market composition by type of content, video-based content accounted for nearly 60% of the total. Text-based content made up about 35%, and audio-based content accounted for approximately 7%⁷ (Figure 2-1-3-9).

The size of the content market saw a significant increase in 2021, and has remained roughly at the same level since then. By type of content, text-based and audio-based content showed an increasing trend (Figure 2-1-3-10).

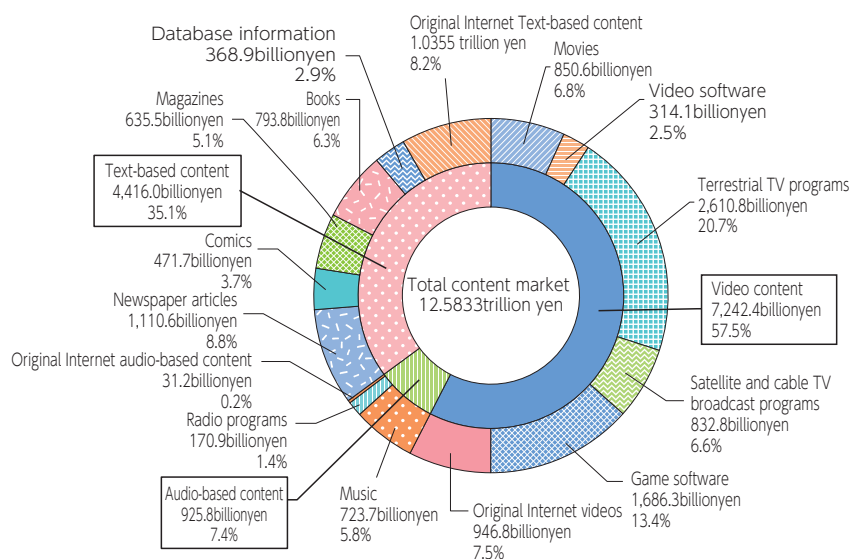
⁴ Accidents falling under Articles 113, 122 or 137 of the Broadcasting Act: "If the suspension of broadcasting caused by the equipment for basic broadcasting or other major accident stipulated in the Ministerial Ordinance of the Ministry of Internal Affairs and Communications occurs, the approved basic broadcaster must report such matter as well as the reason or cause without delay to the Minister for Internal Affairs and Communications."

⁵ https://www.soumu.go.jp/menu_seisaku/ictseisaku/housou_suishin/hoso_teishijiko.html

⁶ https://www.soumu.go.jp/menu_seisaku/ictseisaku/housou_suishin/hoso_teishijiko.html

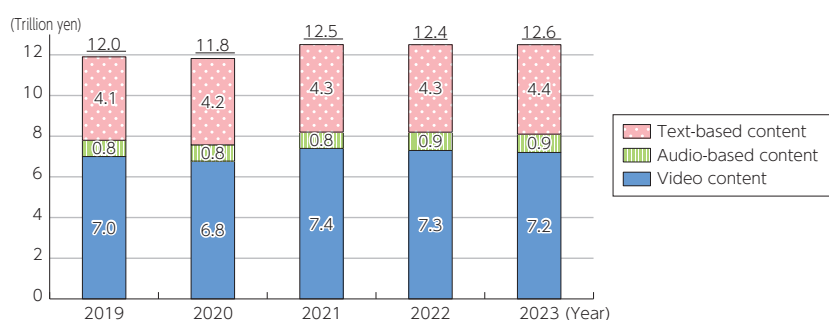
⁷ Rather than aggregating by media, market size was calculated and analyzed after aggregation according to distribution stage such as primary distribution and multi-use with a focus on the original nature of the content.

Figure 2-1-3-9 Breakdown of the Japanese content market (2023)



(Source) MIC Institute for Information and Communications Policy "Survey on Media/Software Production and Distribution"

Figure 2-1-3-10 Changes in the size of the Japanese content market (by content type)



(Source) MIC Institute for Information and Communications Policy "Survey on Media/Software Production and Distribution"

B Status of multi-use

The size of the primary distribution market in 2023 was 9.5898 trillion yen, accounting for about 75% of the total market. The breakdown of the primary distribution market is as follows: video-based content at 5.5128 trillion yen, text-based content at 3.3023 trillion yen, and audio-based content at 774.7 billion yen.

On the other hand, the size of the multi-use market was 2.9936 trillion yen, showing a slight decrease from the previous year. The breakdown is as follows: video-based content at 1.7287 trillion yen, text-based content at 1.1137 trillion yen, and audio-based content at 151.1 billion yen.



Figure (related data) Breakdown of primary distribution market (2023)

Source: MIC Institute for Information and Communications Policy "Survey on Media/Software Production and Distribution"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00178>
(Data collection)



Figure (related data) Breakdown of multi-use market (2023)

Source: MIC Institute for Information and Communications Policy "Survey on Media/Software Production and Distribution"
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00179>
(Data collection)

C Communication-based content market

Within the content market, the size of the communication-based content market, which includes content delivered via the Internet to PCs and smart phones, was 6.0672 trillion yen. In terms of market composition by type of content, video-based content accounted for 56.5%, text-

based content for 34.4%, and audio-based content for 9.1%.

The size of the communication-based content market continues to grow. By type of content, the market size is growing for all types of content.



Figure (related data) Breakdown of the communication content market (2023)

Source: MIC Institute for Information and Communications Policy “Survey on Media/Software Production and Distribution”
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00180>
(Data collection)



Figure (related data) Changes in the size of the communication content market (by content type)

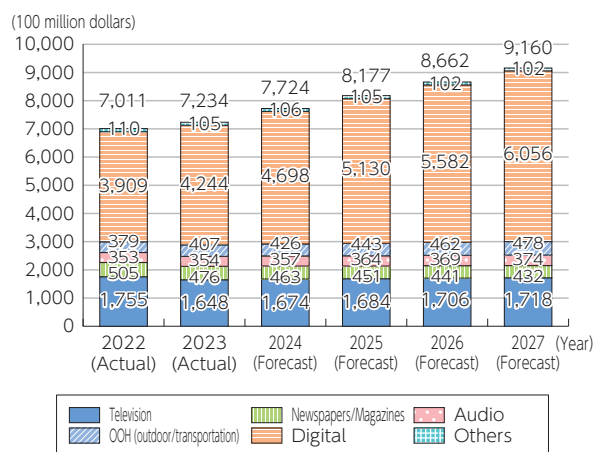
Source: MIC Institute for Information and Communications Policy “Survey on Media/Software Production and Distribution”
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00181>
(Data collection)

(2) Advertising

Looking at the global advertising market, digital advertising expenditure is projected to reach 469.8 billion dollars in 2024 (a 10.7% increase from the previous year), and the proportion of digital advertising expenditure in total advertising expenditure is expected to increase to 60.8% (**Figure 2-1-3-11**). In terms of Japan’s digital ad-

vertising market, in 2024, Internet advertising expenditure reached 3.6517 trillion yen, while advertising in the four mass media⁸ declined to 2.3363 trillion yen. Since 2021, when Internet advertising expenditure first surpassed that of the four mass media, the gap has been widening (**Figure 2-1-3-12**).

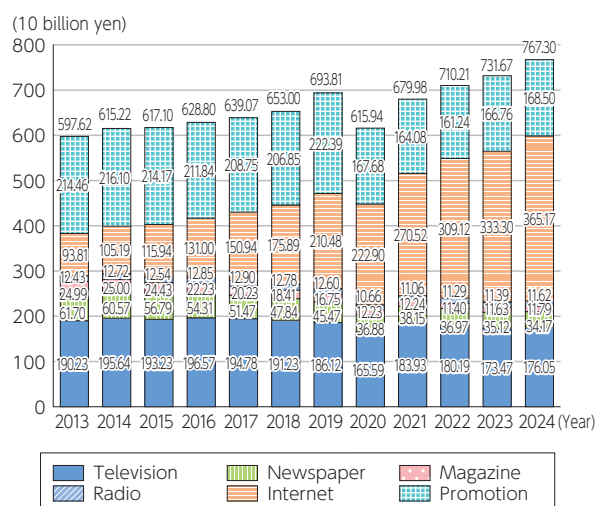
Figure 2-1-3-11 Changes and forecasts of global advertising expenditures by media type



(Source) Prepared based on Dentsu Group “Global Advertisement Spend Growth Rate Forecast (2024-2027)” (December 3, 2024)⁹

⁸ Television media, newspapers, magazines and radio.

⁹ <https://www.group.dentsu.com/jp/news/release/001375.html>

Figure 2-1-3-12 Changes in advertising expenditure by media in Japan¹⁰

(Source) Prepared based on Dentsu "Knowledge & Data 2024 Advertising expenditure in Japan"¹¹



Figure (related data) Changes in global total advertising expenditure

Source: Dentsu Group "Global Advertisement Spend Growth Rate Forecast (2024-2027)"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00184>

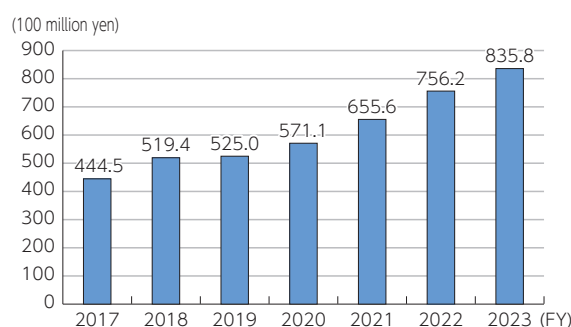
(Data collection)

(3) Trends in overseas exports of Japan's broadcast content

The export value of broadcast content from Japan continued to increase in FY 2023, reaching 83.58 billion yen (a 10.5% increase from the previous year)

(Figure 2-1-3-13).

By entity, the proportion of semi-key private broadcasting stations located in Osaka increased significantly.

Figure 2-1-3-13 Changes in the value of broadcasting content exports from Japan

*1 Value of broadcasting content exports: Total sales to overseas of program broadcasting rights, Internet distribution rights, video/DVD rights, program format remake rights, and merchandising rights, etc.

*2 Calculated based on questionnaire responses submitted by NHK, key private broadcasting stations, semi-key private broadcasting stations, local stations, satellite broadcasters, CATV operators, and production companies, etc.

(Source) Prepared based on MIC "Analysis of the Current Status of Overseas Expansion of Broadcasting Content"



Figure (related data) Changes in the value of Japan's broadcasting content exports by rights

Source: Prepared based on the MIC "Analysis of the Current Status of Overseas Expansion of Broadcasting Content"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00186>

(Data collection)



Figure (related data) Changes in the value of Japan's broadcasting content exports by entities

Source: Prepared based on the MIC "Analysis of the Current Status of Overseas Expansion of Broadcasting Content"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00187>

(Data collection)

¹⁰ Since 2019, advertisements on EC platforms for selling goods and the event field are included in the advertisement expenditure in Japan to estimate the advertisement market. Data for 2018 and before is not retroactively adjusted.

¹¹ https://www.dentsu.co.jp/knowledge/ad_cost/index.html

Section 4 Trends in radio wave usage in Japan

1. Major use by frequency band

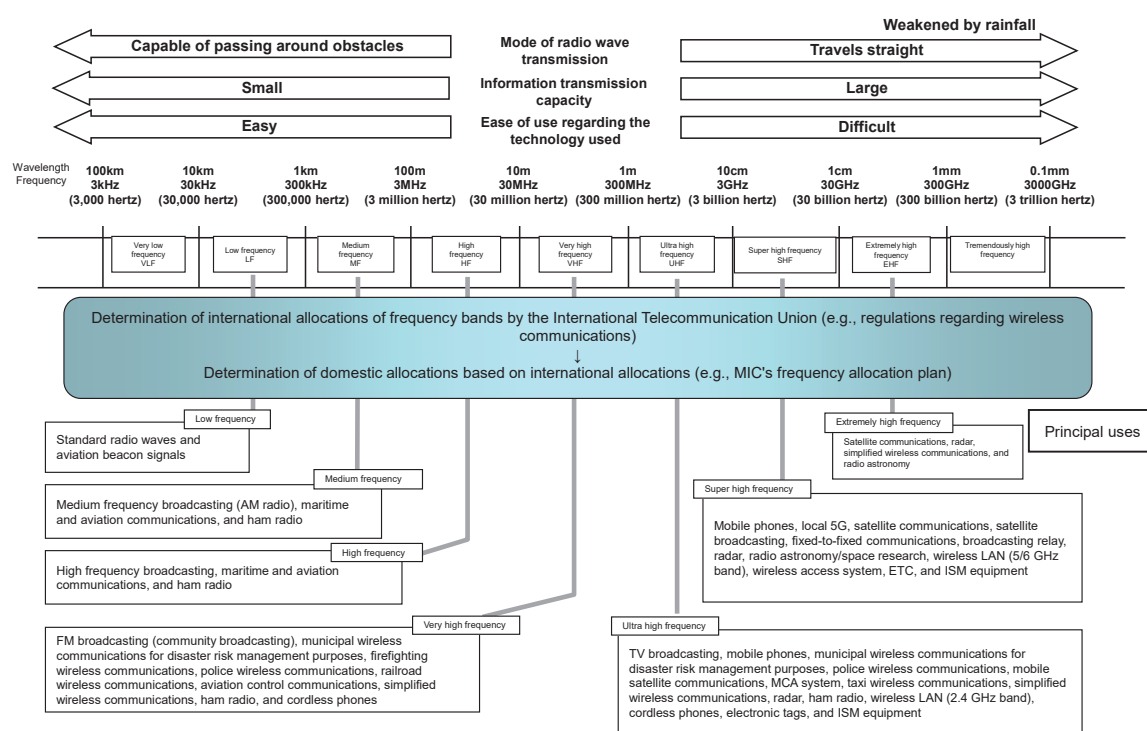
Regarding frequency, the International Telecommunication Union (ITU) divides the world into three regions and specifies international allocations for each frequency band and type of operation based on the Radio Regulations established in the ITU Constitution.

Based on these international allocations, the “Frequency Allocation Plan¹” specifies the frequencies, types

of operations, purposes, and conditions that can be allocated to assist in the application for licenses for radio stations under the Radio Act. When establishing or amending this plan, the Radio Regulatory Council is consulted.

The main uses and characteristics of frequency bands in our country are as shown in (Figure 2-1-4-1).

Figure 2-1-4-1 Main uses and characteristics of each frequency band in Japan



Spectrum	Wavelength	Characteristics
Very low frequency	10 to 100km	Propagating along ground surface, waves of this spectrum can go over low hills. Being capable of propagating in water, the spectrum can be used for seabed exploration.
Low frequency	1 to 10km	Being capable of propagating to very distant places, the spectrum is used by standard frequency stations to inform radio clock, etc. of time and frequency standard.
Medium frequency	100 to 1000m	Capable of propagating through reflection off the E-layer of the ionosphere that is formed at the height of about 100km, the spectrum is used mainly for radio broadcasting.
High frequency	10 to 100m	Capable of reaching the other side of the globe by being reflected off the F-layer of the ionosphere that is formed at the height of about 200 to 400km and by repeating reflection between F-layer and the ground surface. Widely used for ocean ship and international flight plane communication, international broadcasting and amateur radio.
Very high frequency	1 to 10m	Waves of this spectrum propagate rather straight and are not easily reflected off the ionosphere, but are capable of reaching the other side of mountains and buildings to a certain extent. The spectrum is widely used for a variety of mobile communications including emergency and fire emergency radio.
Ultra high frequency	10cm to 1m	Waves of this spectrum have stronger tendency to propagate straight compared with very high frequency, but are capable of reaching the other side of mountains and buildings to a certain extent. The spectrum is widely used mostly for a variety of mobile communication systems including mobile phones, and digital television broadcasting and microwave ovens.
Super high frequency	1 to 10cm	Due to the strong tendency to propagate straight, this spectrum is suitable for emission to a specific direction. It is mainly used for fixed trunk circuits, satellite communication, satellite broadcasting and wireless LAN.
Extremely high frequency	1mm to 10mm	With strong tendency to propagate straight, waves of the spectrum can transmit very large information quantity, but not very far in bad weather due to rain or fog. For this reason, the spectrum is used for relatively short-distance radio access communication and image transmission systems, simplicity radio, car collision prevention radar and radio telescopes for astronomical observation.
Tremendously high frequency	0.1mm to 1mm	The spectrum has nature similar to light. It is rarely used for communication but used for radio telescopes for astronomical observation as is the case of Extremely high frequency.

¹ Frequency Allocation Plan: <https://www.tele.soumu.go.jp/j/adm/freq/search/share/index.htm>

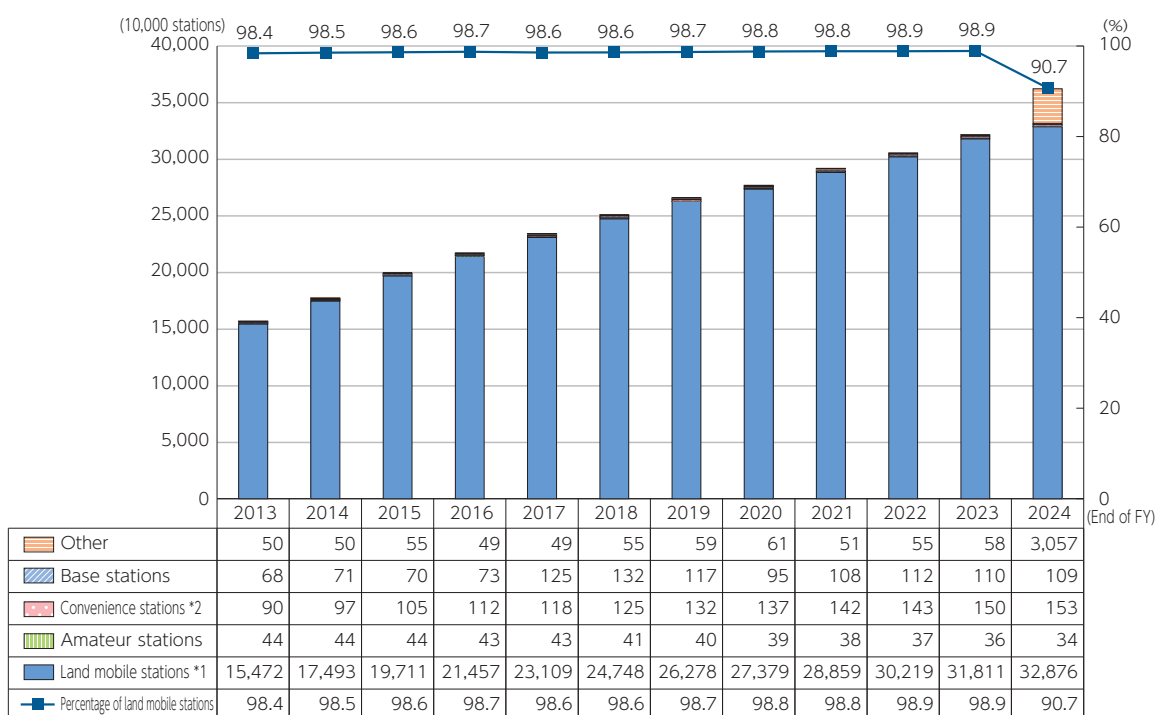
2. Trends in the number of radio stations

As of the end of the FY2024, the number of radio stations (excluding radio stations that do not require licenses, such as wireless LAN terminals) was 362.3 million (an increase of 12.6% from the previous fiscal year). Among these, the number of land mobile stations such as mobile phone terminals was 328.76 million (an increase of 3.3% from the previous fiscal year), accounting for 90.7% of the total number of radio stations, which is a decrease from the previous year but is still at a high level. The reason for this decrease is the significant increase in the number of other radio stations (from 0.58

million at the end of FY2023 to 30.57 million at the end of FY2024). In particular, the impact of the increase in portable mobile earth stations following the launch of satellite direct communication services was significant. The number of portable mobile earth stations has increased by 30.03 million from the end of FY2023 (from 0.14 million at the end of FY2023 to 30.17 million at the end of FY2024).

Additionally, the number of simple radio stations also increased to 1.53 million (an increase of 2.2% from the previous fiscal year) (**Figure 2-1-4-2**).

Figure 2-1-4-2 Changes in the number of radio stations



*1 Land mobile station: A radio station (such as mobile phone devices) operated while moving on land or stationary at an unspecified point.

*2 Convenience radio station: A radio station that performs simple radio communication.

3. Radio wave monitoring to eliminate obstruction of important radio communication etc.

The MIC has established “DEURAS (DEtect Unlicensed Radio Stations)” facilities to detect radio sources that interfere with important radio communications, such as fire and emergency radio, aviation and maritime radio, and mobile phones, and to crack down on unauthorized radio stations that disrupt the radio usage environment using sensor station facilities installed on the rooftops of major cities’ towers and buildings and unauthorized radio station search vehicles².

In FY2024, the number of interference and obstruction reports was 1,847, a decrease of 484 cases (20.8% decrease) from the previous fiscal year. Among these,

the number of cases of interference with important radio communications decreased by 36 cases (9.2% decrease) to 355 cases compared with the previous fiscal year. The total number of measures for such interference and obstruction in FY2024, including previously unaddressed cases, was 2,057 (**Figure 2-1-4-3**).

Furthermore, the number of appearances of unauthorized radio stations in FY2024 increased by 94 cases (2.5% increase) to 3,926 cases compared with the previous year. The total number of measures in FY2024, including previously unaddressed cases, increased by 433 cases (49.1% increase) to 1,315 cases compared with the

² Regarding obstructions to important radio communications, in FY2010, DEURAS established a 24-hour system for receiving obstruction reports and has been working to promptly eliminate them. As an international radio wave monitoring facility registered with the International Telecommunication Union (ITU), DEURAS plays a role in HF and cosmic radio wave monitoring.

previous year. The breakdown of these measures includes 41 prosecutions (3.1%) and 1,274 directives

(96.9%) (Figure 2-1-4-4).

Figure 2-1-4-3 Changes in the number of reports of interference and obstruction of radio stations and the number of actions taken

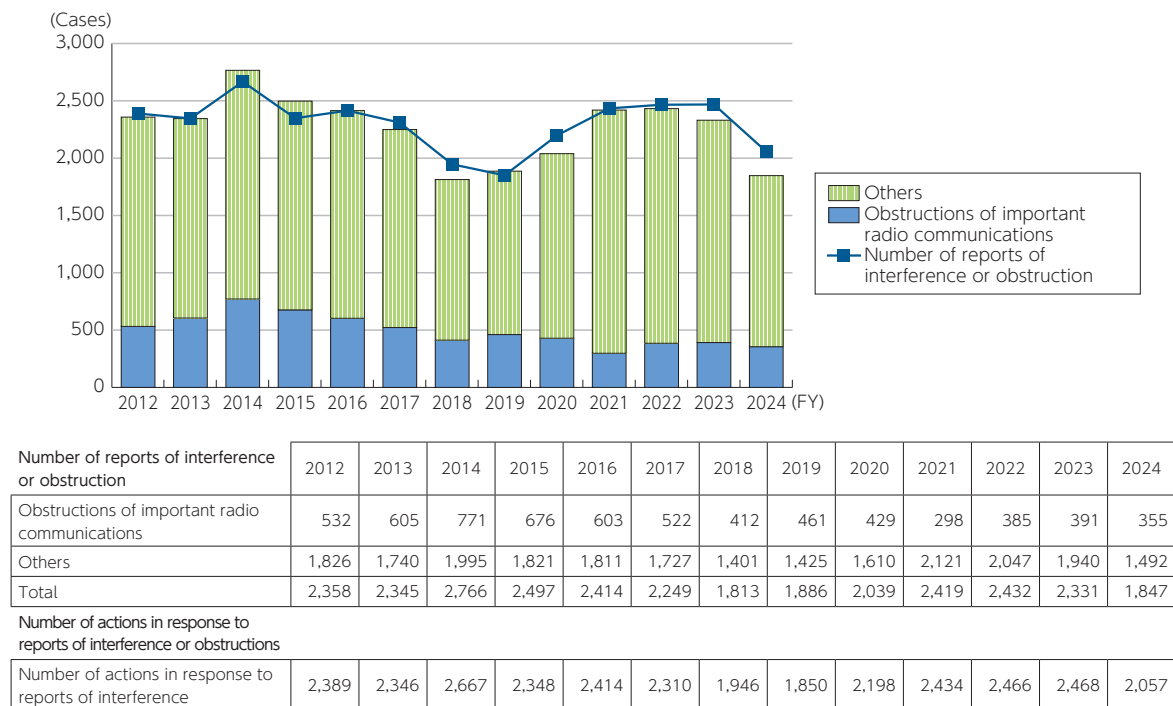
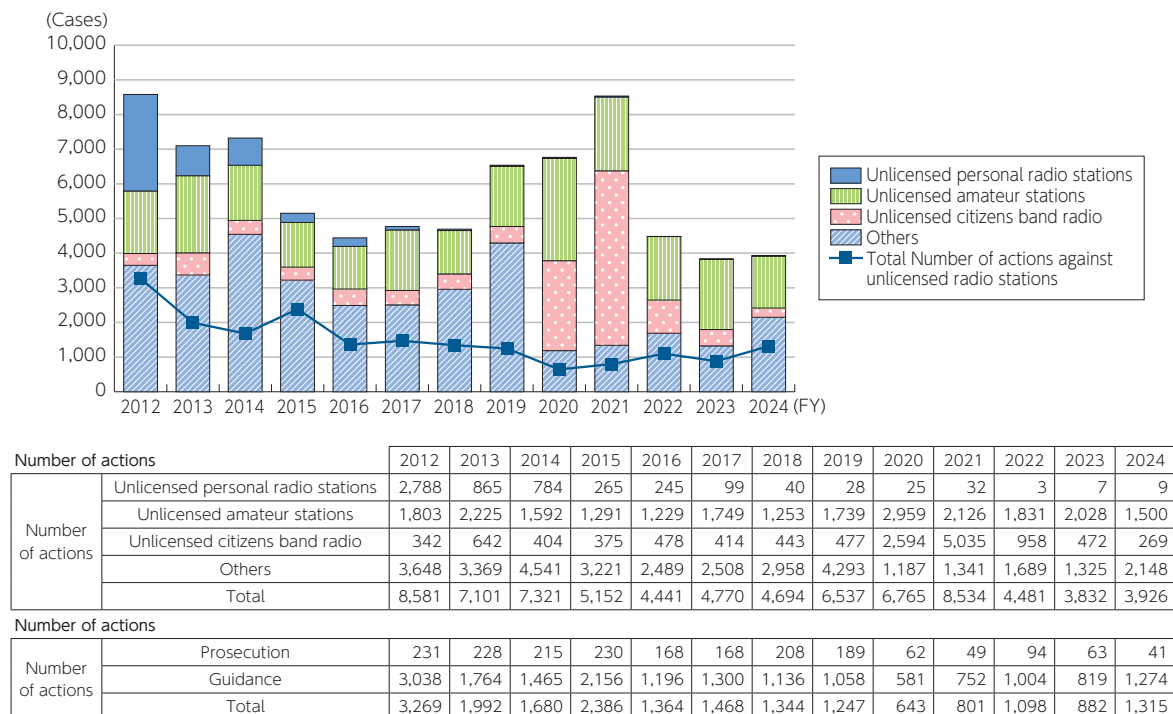


Figure 2-1-4-4 Changes in the number of reports of unlicensed radio stations and the number of actions taken



Section 5 Trends related to ICT equipment and devices in Japan and overseas

1. Trends in the ICT equipment market in Japan and overseas

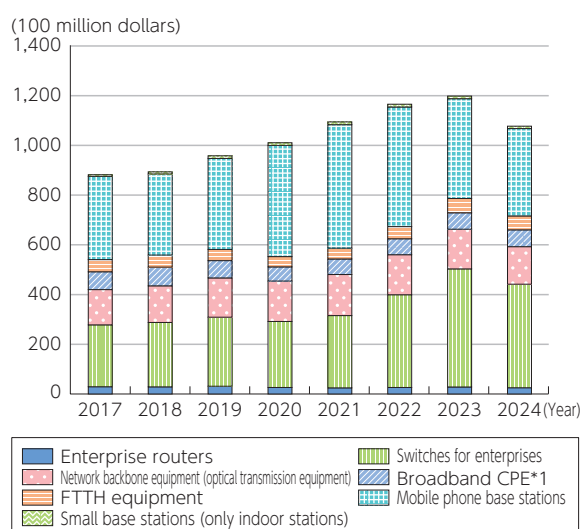
(1) Market size

The global shipment value of network equipment has been on an upward trend since 2017; however, in 2024, the amount decreased to 107.7 billion dollars (a 10.1% decrease from the previous year) (Figure 2-1-5-1). The breakdown shows that mobile base stations and enterprise switches are the main components.

In Japan, the production value of network equipment had been declining since the early 2000s but started to increase gradually from 2018. It then turned downward again in 2021, but increased to 661.6 billion yen in 2024. The breakdown indicates a decrease in telephone application devices¹ and switches due to the shift from fixed-

line phones to mobile and IP phones. Currently, wireless application devices², carrier devices³, and other wireless communication equipment⁴ constitute the largest segments. The production of base station communication equipment has shown significant fluctuations, experiencing a downturn after 4G investments were largely completed in 2016. However, following a temporary increase in 2020, it has declined. Network connection equipment⁵ used for IP communication started to increase in 2019, and then decreased from 2021 to 2022. It then briefly increased in 2023, but decreased in 2024.

Figure 2-1-5-1 Changes in the value of global network equipment shipments



* Customer-facing equipment for broadband communications via xDSL (ADSL, VDSL, G.fast, etc.) and cable networks.

(Source) Omdia

(2) Market trends by equipment type

A 5G base stations

The global market size (shipment value) for 5G base stations (macro cells) in 2024 was 24.9 billion dollars (a 15.2% decrease from the previous year), while in Japan, it was 1.7 billion dollars (a 25.7% decrease from the previous year) (Figure 2-1-5-3). Although both markets seem to have already peaked, they are anticipated to maintain high levels. In 2024, the global market share (shipment value) for 5G base stations (macro cells) was led by Huawei (31.0%), followed by Ericsson (26.6%) and

Nokia (18.1%). This indicates that major overseas companies hold a high share in the 5G base station (macro cell) market, while Japanese companies have low international competitiveness.

On the other hand, Japanese companies are expected to hold a 33% share of the global market for electronic components incorporated into mobile base stations and smartphones as of 2023, indicating potential competitiveness for Beyond 5G (Figure 2-1-5-4).

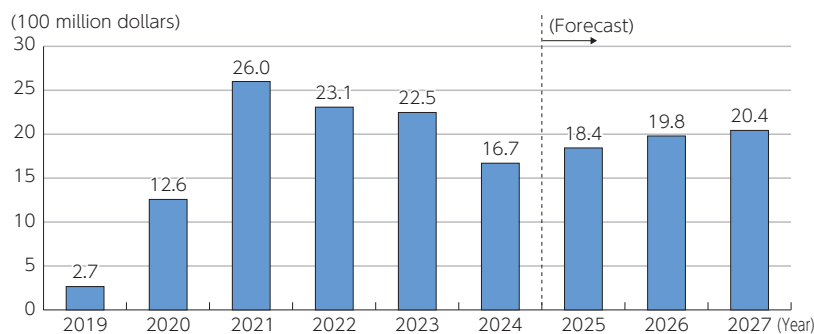
¹ Key telephone system and interphones

² Maritime/aeronautical radars, wireless location measuring devices, telemeter/telecontrol apparatus, etc.

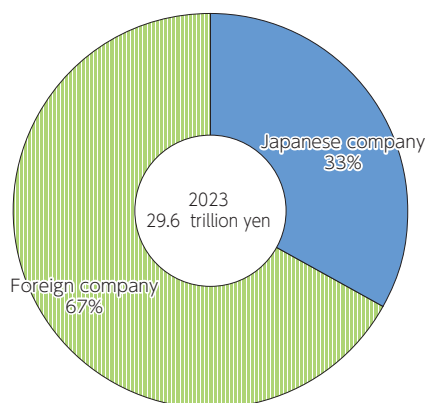
³ Digital transmission devices, power line carrier devices, CATV carrier devices, optical transmission devices, etc.

⁴ Satellite/terrestrial fixed communications equipment, maritime/aeronautical communications equipment, transceivers, etc.

⁵ Routers, hubs, gateways, etc.

Figure 2-1-5-3 5G base stations (macro cells) market size in Japan (value of shipments)

(Source) Omdia

Figure 2-1-5-4 Share of global electronic components market (in terms of sales) (2023)

(Source) Omdia

**Figure (related data) Global 5G base stations (macro cells) market size (value of shipments)**

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00196>

(Data collection)

**Figure (related data) Global 5G base stations (macro cells) market share (value of shipments)**

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00197>

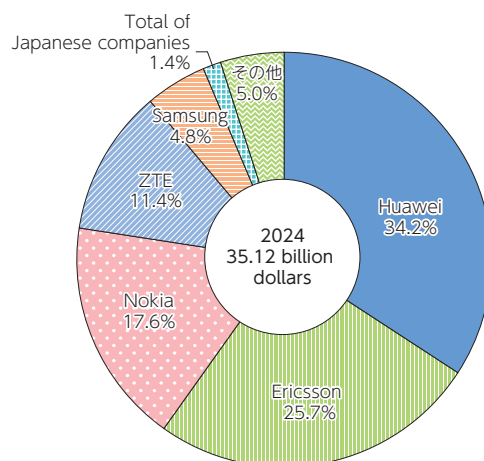
(Data collection)

B Macro cell base stations (including 5G)

In 2024, the global market share based on shipment value was led by Huawei (34.2%), followed by Ericsson

(25.7%) and Nokia (17.6%), with Japanese companies collectively holding a 1.4% share (**Figure 2-1-5-5**).

Figure 2-1-5-5 Share of the global macro cells base station market (value of shipments in 2024)



(Source) Omdia

C Enterprise routers

In 2024, the global market share based on shipment value was led by Cisco (62.6%), followed by H3C (10.2%) and Huawei (8.7%).

In the Japanese market, the shipment value share in 2024 was led by Cisco (35.0%), followed by NEC (27.5%) and Yamaha (23.5%).



Figure (related data) Global enterprise router market share

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00199>
(Data collection)

Figure (related data) Japanese enterprise router market share

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00200>
(Data collection)

2. Trends in the ICT device market in Japan and overseas

(1) Market size

The global shipment value of information terminals in 2024 was 600.7 billion dollars (a 6.9% increase from the previous year) (Figure 2-1-5-6). The breakdown shows that smartphones and PCs are the main contributors.

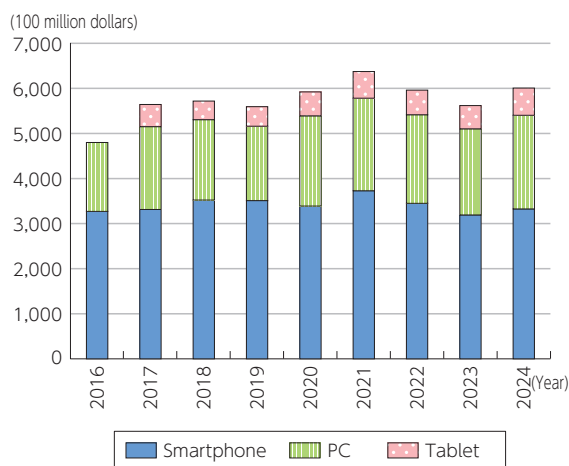
The production value of information terminals in Japan has significantly decreased compared with the

2000s. It has remained flat at around 1 trillion yen since 2020, reaching 1.092 trillion yen in 2024. The breakdown shows that mobile phones and PHS⁶ were major contributors until the mid-2010s, but have since declined, and now desktop PCs, laptop PCs, and information terminals⁷ are the main contributors.

⁶ Since 2019, the value of mobile phone and PHS production has not been disclosed, so the values for radio communications equipment (including satellite communications equipment) have been used after deducting the values of broadcasting equipment, fixed communications equipment (satellite and terrestrial), other terrestrial mobile communications equipment, maritime/aeronautical mobile communications equipment, base station communications equipment, other radio communications equipment and associated radio equipment. In addition, the value of radio communications equipment production (including satellite communications equipment) has not been disclosed since 2022, therefore the value is recorded as zero.

⁷ External memories, printers, monitors, etc. Information kiosk terminal devices are excluded because their production has not been disclosed in some years.

Figure 2-1-5-6 Changes in the value of global information device shipments



* Tablets have been counted since 2017.

(Source) Omdia

(2) Market trends by device

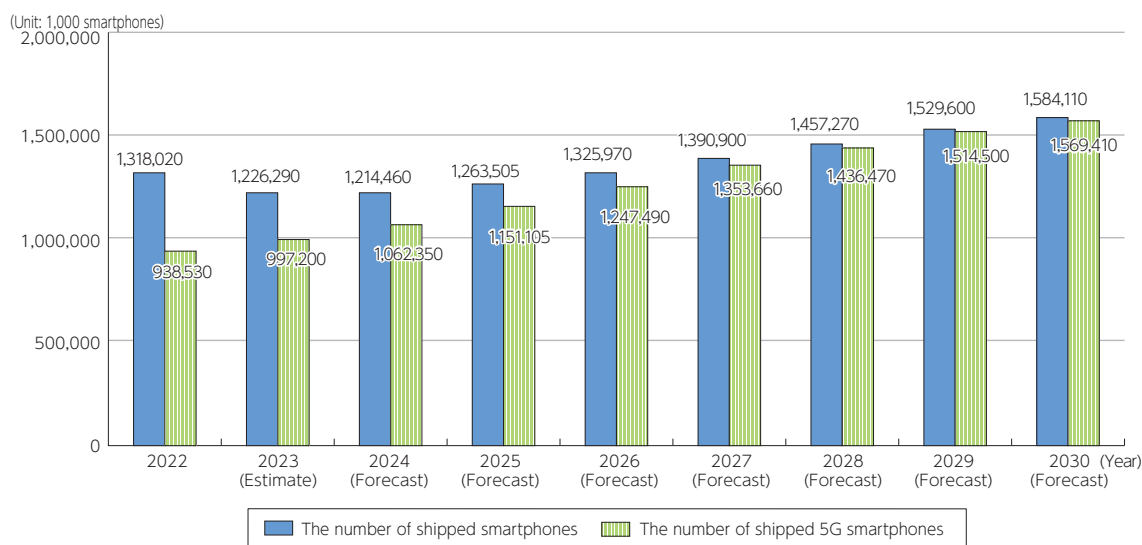
A 5G-compatible smartphones

The global shipment volume of 5G-compatible smartphones was 938.53 million units in 2022, accounting for 71% of the total smartphone shipments (1.31802 billion units). The shipment volume of 5G-compatible smartphones is expected to continue expanding, reaching

1.56941 billion units by 2030 (**Figure 2-1-5-8**).

The shipment volume of 5G-compatible smartphones in Japan was 25.05 million units in 2023 (a 12.4% decrease from the previous year) (**Figure 2-1-5-9**).

Figure 2-1-5-8 Changes and forecasts of the global shipment volume of smartphones and 5G smartphones



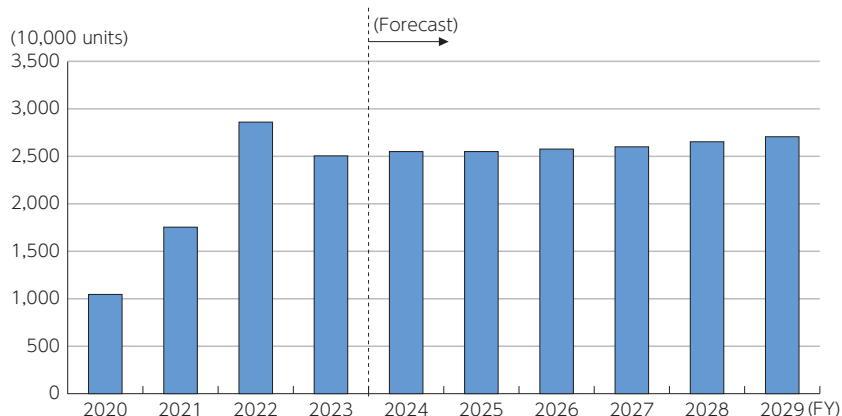
*1 It is based on manufacturers' shipment volume.

*2 The shipment volume of 5G smartphones is included in the shipment volume of smartphones.

*3 The value for 2023 is estimated, and the values for 2024 onwards are forecasts.

(Source) Yano Research Institute Ltd. "Global Market of Mobile Phone Subscriptions and Shipment Volume: Key Research Findings 2023" (published on April 2, 2024)

Figure 2-1-5-9 Shipment of 5G smartphones in Japan



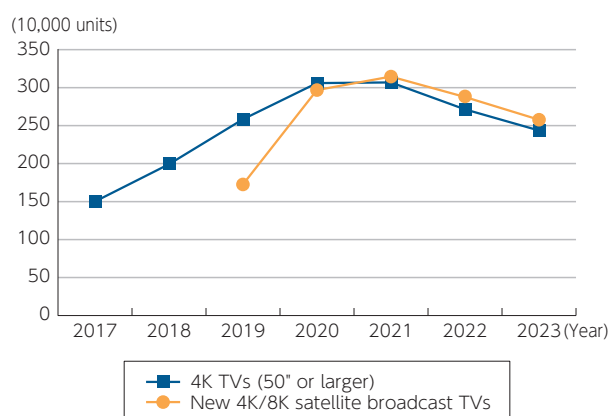
(Source) CIAJ "Medium-term Demand Forecast for Communications Devices [FY2024-DY2029]"

B 4K and 8K televisions

The domestic shipment volume of 4K-compatible televisions (50 inches and above) was 2.43 million units in 2023 (a 10.3% decrease from the previous year), and the shipment volume of new 4K/8K satellite broadcast-com-

patible televisions was 2.57 million units in 2023 (a 10.4% decrease from the previous year). Both categories appear to be stabilizing (Figure 2-1-5-10).

Figure 2-1-5-10 Number of 4K and 8K televisions shipped in Japan



(Source) JEITA "Domestic Shipments of Consumer Electronic Devices"

C VR and AR

The global shipment volume of VR headsets had been increasing since 2019, but declined in 2023, and in 2024, reached 6.9 million units in 2024 (a 9.9% decrease from the previous year).

In Japan, the shipment volume of XR (which includes

"VR (Virtual Reality)", "AR (Augmented Reality)", and "MR (Mixed Reality)" compatible HMDs and smart glasses was 0.38 million units in 2022, and it is predicted to increase to 1.02 million units by 2025.

**Figure (related data) Changes in and forecast for global VR headset shipments**

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00206>

(Data collection)

**Figure (related data) Forecast on domestic shipment volume of HMDs for XR (VR/AR/MR) and smart glasses**

Source: Yano Research Institute Ltd., "The Market of HMDs (Head Mounted Displays) for XR (VR/AR/MR) and Smart Glasses (2023)" (published in July 5, 2023)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00207>

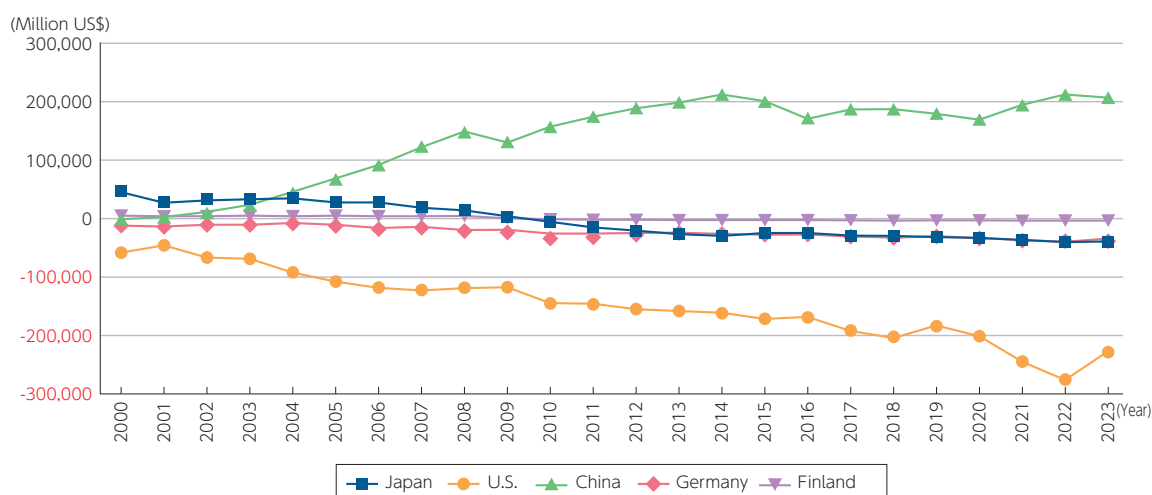
(Data collection)

3. Trends in the import and export of ICT equipment and devices by country

Regarding the import and export of ICT equipment and devices⁸ in each country, according to the “UNCTAD STAT” by the United Nations Conference on Trade and Development (UNCTAD)⁹, Japan has had a trade deficit since 2010, with the export value reaching 54.9 billion dollars (a 9.9% decrease from the previous year) and the import value reaching 94.3 billion dollars (a 6.9%

decrease from the previous year) in 2023, resulting in a trade deficit of 39.4 billion dollars (a 2.4% decrease from the previous year). In 2023, the U.S. had a trade deficit of 227.2 billion dollars (a 17.7% decrease from the previous year), while China had a trade surplus of 206.9 billion dollars (a 2.6% decrease from the previous year) (Figure 2-1-5-11).

Figure 2-1-5-11 Changes in the value of the export surplus of ICT equipment and devices by country



(Source) UNCTAD “UNCTAD STAT”¹⁰



Figure (related data) Changes in the value of exports of ICT equipment and devices by country

Source: UNCTAD “UNCTAD STAT”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00209>

(Data collection)



Figure (related data) Changes in the value of imports of ICT equipment and devices by country

Source: UNCTAD “UNCTAD STAT”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00210>

(Data collection)

⁸ Computers, communications equipment, consumer electronics, electronic components, etc.

⁹ It should be noted that due to differences in the scope of calculation, the figures do not necessarily match the export, import, and export/import values of ICT goods based on the Ministry of Finance’s “Trade Statistics,” as stated in Part II, Chapter 1, Section 1, Item 4, “Exports and imports in the ICT field.”

¹⁰ <https://unctadstat.unctad.org/EN/Index.html>

4. Trends in the semiconductor¹¹ market

The global semiconductor market (shipment value) reached 90.6 billion dollars in 2024 (a 4.7% decrease from the previous year). Looking at the breakdown, discrete semiconductors are the most abundant. For image sensors, which have seen the highest growth rate since 2013, a Japanese company (Sony Semiconductor Solutions) holds a 51.1% share.

Japan's semiconductor market (shipment value) had been declining since 2018, but increased from 2021 before falling again in 2023, reaching 6.6 billion dollars in 2024 (a 6.5% decrease from the previous year). Similar to the global market, discrete semiconductors are the most abundant when looking at the breakdown.



Figure (related data) Changes in global semiconductor market (value of shipments)

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00211>

(Data collection)



Figure (related data) Changes in global imaging sensor market share (value of shipments in 2024)

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00212>

(Data collection)



Figure (related data) Changes in Japan's semiconductor market (value of shipments)

Source: Omdia

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00213>

(Data collection)

¹¹ In this section, this means the discrete semiconductors used for the imaging sensors, MCUs, MEMS sensors and indispensable power sources that are positioned as key devices in the electronic equipment implementing IoT and AI, which are being introduced as part of the DX.

Section 6 Trends in platforms

1. Market trends

Comparing major players in the ICT-related market based on their market capitalization as of March 2024 and March 2025, Apple surpassed Microsoft to take the top spot. While the U.S.-based GAFAM companies continue to dominate, NVIDIA has risen to second place, buoyed by strong performance and expansion in de-

mand for semiconductor-related products in the generative AI space. Samsung Electronics (the Republic of Korea), which was ranked 11th in 2024, has fallen out of the top 15, while stock market valuations of media and software companies are increasing (**Figure 2-1-6-1**).

Figure 2-1-6-1 Changes in the top 15 companies by market capitalization in the global ICT market

2024					2025			
Company name	Major business	Country or region	Market capitalization (100 million dollars)		Company name	Major business	Country or region	Market capitalization (100 million dollars)
Microsoft	Cloud service	U.S.	31,420		↑ Apple	Hardware, software, services	U.S.	33,610
Apple	Hardware, software, services	U.S.	26,380		↑ NVIDIA	Semiconductor	U.S.	29,450
NVIDIA	Semiconductor	U.S.	23,750		↓ Microsoft	Cloud service	U.S.	29,380
Amazon.com	Cloud service, e-commerce	U.S.	18,670		Amazon.com	Cloud service, e-commerce	U.S.	21,800
Alphabet/Google	Search engine	U.S.	18,660		Alphabet/Google	Search engine	U.S.	20,790
Meta Platforms/ Facebook	SNS	U.S.	12,820		Meta Platforms/ Facebook	SNS	U.S.	15,870
Taiwan Semiconductor Manufacturing	Semiconductor	Taiwan	6,350		↑ Broadcom	Hardware, semiconductor	U.S.	8,850
Broadcom	Hardware, semiconductor	U.S.	6,260		↓ Taiwan Semiconductor Manufacturing	Semiconductor	Taiwan	7,760
Visa	Payment	U.S.	5,650		Visa	Payment	U.S.	6,730
Mastercard	Payment	U.S.	4,440		↑ Tencent	SNS	China	5,860
Samsung Electronics	Hardware	Republic of Korea	3,960		↓ Mastercard	Payment	U.S.	4,970
Oracle	Cloud service	U.S.	3,470		Oracle	Cloud service	U.S.	4,320
Tencent	SNS	China	3,440		new Netflix	Media	U.S.	4,270
Salesforce	Cloud service	U.S.	2,970		new SAP	Software	Germany	3,270
Advanced Micro Devices (AMD)	Semiconductor	U.S.	2,890		new Alibaba	e-commerce	China	3,150

* The figures for 2024 are as of March 27, 2024, and the ones for 2025 are as of March 27, 2025.

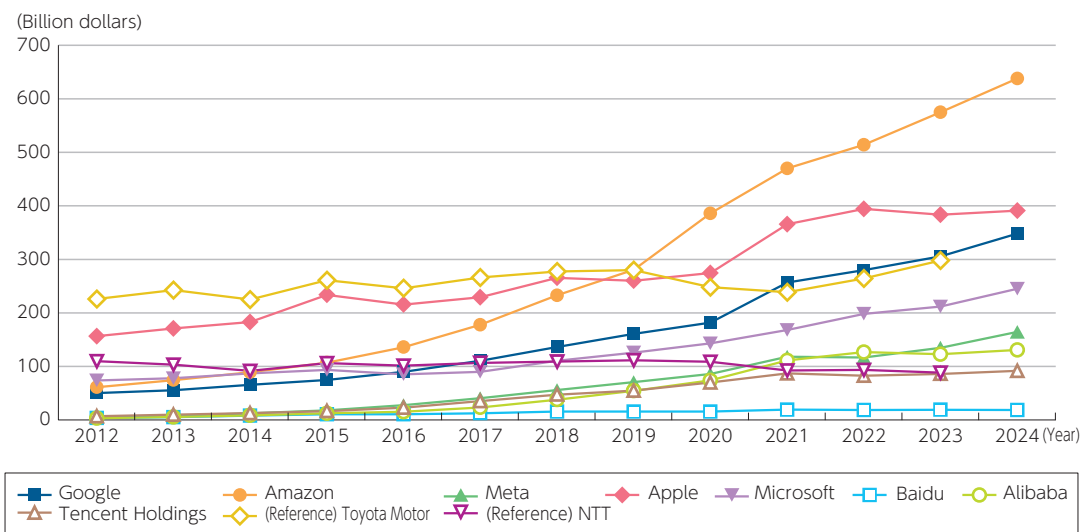
(Source) Acquired from Wright Investors' Service, Inc.¹

Looking at the sales trends of the world's leading platform providers in the U.S. and China, while many of them

continue to see sales growth, Apple, Alibaba, and Baidu are experiencing sluggish growth (**Figure 2-1-6-2**).

¹ <https://www.corporateinformation.com/#/tophundred>

Figure 2-1-6-2 Sales of platform providers in the U.S. and China



*For Japanese and Chinese companies, figures are converted into dollars using the average exchange rate for each year. For Japanese companies, fiscal year closing values are used.

(Source) Prepared based on Statista data and the financial information of each company

2. Trends of major platform providers

The major platform companies in the U.S. and China are leveraging their respective strengths and enhancing their services that utilize generative AI. In particular, multiple platforms are investing in the development of

generative AI, so it is anticipated that generative AI will be utilized in various scenarios in the future (Figure 2-1-6-3).

Figure 2-1-6-3 Trends of major platform providers in the U.S. and China

<The U.S.>			
Key areas	Company	Business overview and areas	New areas and businesses
Advertising, search	Alphabet (Google)	It provides the largest search engine service in the world, and is developing a massive economic sphere including cloud and devices focused mainly in search advertising.	In addition to strengthening its search engine services using generative AI, Google is likely to focus on using AI in the physical world, such as in robots.
E-commerce	Amazon	It is one of the largest e-commerce operator in the world, with a huge economic sphere centered on cloud services (AWS).	In addition to providing generative AI-related services on AWS, Amazon is strengthening its efforts related to generative AI by announcing its own generative AI model.
SNS, apps	Meta (Facebook)	The company provides one of the world's largest social media services. In 2021 it changed its name to Meta Platforms to promote its metaverse business.	Meta is focusing on developing its generative AI assistant "Meta AI" and the large-scale language model "Llama," as well as AI infrastructure such as data centers and undersea cables.
Communications devices, terminals	Apple	It is the world's largest manufacturer and retailer of the internet and digital home appliances. The company has developed a massive economic sphere centered on iPhone and other devices.	Apple is expanding its business centered around iPhone at its core and is focusing on on-device generative AI using a small language model (SLM).
Terminals, cloud	Microsoft	It is one of the largest software vendors in the world. The company has a massive economic sphere centered on software and cloud services such as Windows and Office.	While focusing on utilizing generative AI in collaboration with OpenAI, Microsoft also announced that it will develop its own generative AI model for business software, therefore future developments are likely to draw attention.
<China>			
Key areas	Company	Business overview and areas	New areas and businesses
Advertising, search	Baidu	Baidu is the largest search engine operator in China. It is using abundant data obtained from its search services to advance AI technology development. It is focusing on collaboration with various industries, and is expanding into autonomous driving.	Baidu launched its generative AI service called "ERNIE Bot." The number of its users reached 430 million people in November 2024, making it the most used LLM in China. The company is focused on the AI business, including providing AI AgentBuilder.
E-commerce	Alibaba	It is the world's largest e-commerce operator based on gross merchandise volume. The company is leveraging data technology to provide services ranging from marketing to logistics and payments, and also expanding to cloud.	Alibaba is promoting an AI-driven business strategy, increasing investment in AI infrastructure and focusing on industrial LLMs, as well as AI agents for corporate digital transformation.
SNS, apps	Tencent	It is the China's largest social media app platformer. The company has built a massive digital ecosystem to provide payment services, games and other services based on "WeChat".	Tencent reorganized its AI team in 2024 to focus on research and development of its own AI model "Konggen," while also introducing models from other companies, such as DeepSeek, into its SNS to improve usability.
Communications devices, terminals	Huawei	It is a leading global communications device vendor with operations in the following areas: ICT infrastructure, devices, cloud services, digital energy, and automobile solutions.	In 2024, Huawei released the world's first tri-fold smartphone, which attracted attention, and continues to focus on its device business, as well as its automotive and energy businesses, which have turned profitable.

(Source) Prepared based on published materials of each company



Figure (related data) Sales of major platform providers in the U.S. and China by business

Source: Prepared based on published materials of each company

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00236>

(Data collection)

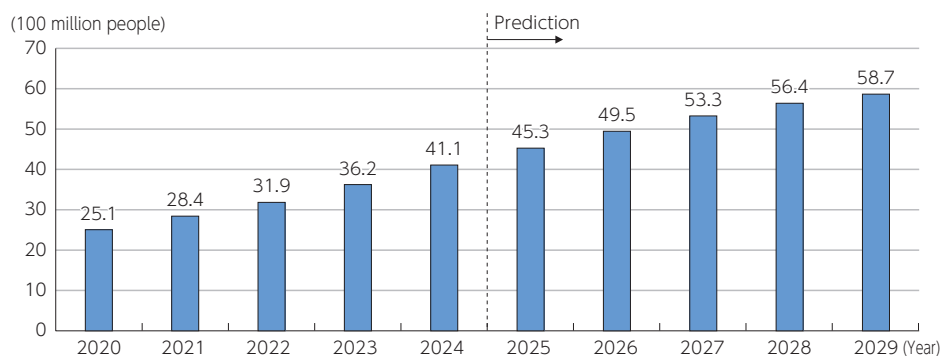
Section 7 Trends in the market of ICT services and contents and application services

1. SNS

The number of social media users worldwide¹ is expected to increase from 4.11 billion in 2024 to 5.87 billion by 2029. Social media is being used not only for text

communication purposes but also for other purposes such as watching short video content (Figure 2-1-7-1).

Figure 2-1-7-1 Changes and forecasts of the number of global social media users



(Source) Prepared based on Statista (data obtained on February 1, 2025)²

2. EC

The global EC market sales continue to show an increasing trend, with an estimated expansion from 7.2 trillion dollars in 2024 to 10.4 trillion dollars in 2028. The average annual growth rate by country from 2024 to 2029 is expected to be high in Turkey, Brazil, India and

Mexico, while countries such as Japan, the U.S., and Germany are expected to fall below the global average, and South Korea is expected to have a particularly low growth rate.



Figure (related data) Changes and forecasts of sales in the global EC market

Source: Prepared based on Statista (a.o. eMarketer, Activate, Digital Commerce 360) (data obtained on February 1, 2025)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00238>
(Data collection)



Figure (related data) Growth rate of EC market by country (2024 to 2029)

Source: Prepared based on Statista "Statista Digital Market Insights" (data obtained on February 1, 2025)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00239>
(Data collection)

3. Searching services

In the world market for desktop search services, Google holds a high share, but its share has gradually decreased to 79.1% as of December 2024. On the other hand, Bing's share is expanding, reaching double digits at 11.9% as of December 2024. Microsoft's browser "Edge" sets Bing as the default search service, contributing to the expansion of Bing's share.

In Japan, as of December 2024, Google holds the highest share, accounting for over 70% in personal computers, smartphones and tablets. Additionally, Bing's share is roughly 12% in personal computers, while Yahoo! holds a share of less than 1% in smartphones and tablets, indicating differences in trends by device.

¹ The people using social media sites and applications at least once a month.

² <https://www.statista.com/forecasts/1146659/social-media-users-in-the-world>



Figure (related data) Changes in global market share of search engines (desktop)

Source: Prepared based on StatCounter (cited from Statista) (data obtained on January 31, 2025)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00242>
(Data collection)



Figure (related data) Changes in global market share of search engines (mobile)

Source: Prepared based on StatCounter (cited from Statista) (data obtained on January 31, 2025)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00243>
(Data collection)



Figure (related data) Market share of searching engines in Japan

Source: Prepared based on StatCounter (cited from Statista) (data obtained on January 31, 2025)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00244>
(Data collection)

4. Video streaming, music streaming and e-book

The global market for video streaming, music streaming, and e-books has continued to grow, driven by the increasing popularity of subscription-based services and

the rise in at-home time due to the spread of COVID-19. The total market size reached 180.3 billion dollars in 2024, marking a 12.1% increase from the previous year.



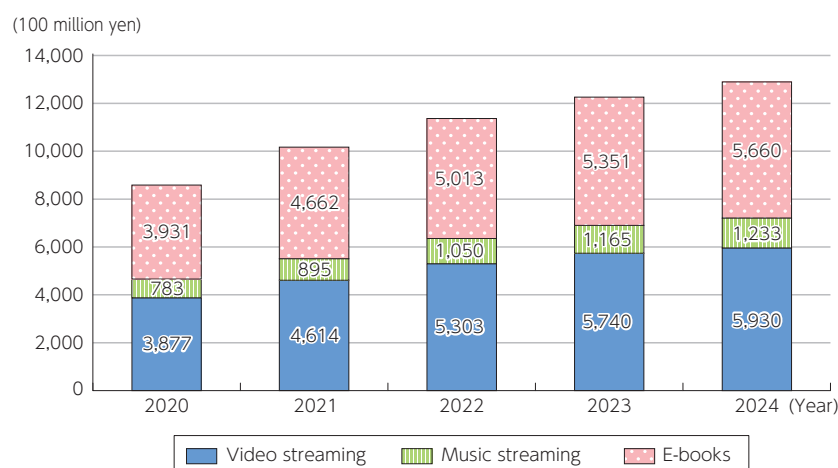
Figure (related data) Changes in and forecast for the size of the global video streaming, music streaming and e-book markets

Source: Prepared based on Omdia and Statista (data obtained on March 14, 2025)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00245>
(Data collection)

In Japan, the video streaming market reached 593 billion yen (a 3.3% increase from the previous year), the music streaming market 123.3 billion yen (a 5.8% increase), and the e-book market 566 billion yen (a 5.8%

increase) in 2024 (**Figure 2-1-7-2**). These markets are all experiencing growth trends similar to those seen globally.

Figure 2-1-7-2 Changes in the size of the video streaming, music streaming and e-book markets in Japan



(Source) Prepared based on GEM Partners "Video Streaming (VOD) Market Forecast for Five Years (2025-2029) Report"³, the Recording Industry Association of Japan "Japan's Recording Industry 2025"⁴ and the All Japan Magazine and Book Publisher's and Editor's Association/Research Institute for Publications (2025) "Quarterly Publication Index - Winter 2025 Issue"⁵.

³ <https://www.gem-standard.com/columns/1029>

⁴ <https://www.riaj.or.jp/t/pdf/issue/industry/RIAJ2025.pdf>

⁵ <https://shuppankagaku.com/wp/wp-content/uploads/2025/01/%E3%83%8B%E3%83%A5%E3%83%BC%E3%82%B9%E3%83%AA%E3%83%AA%E3%83%BC%E3%82%B92501.pdf>

5. New trends in the market of ICT services and contents and application services

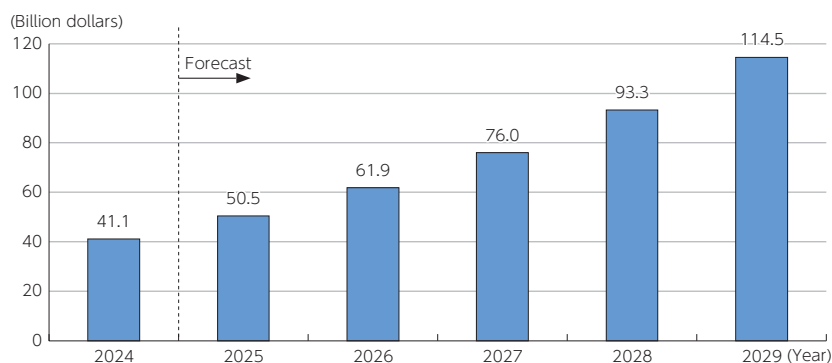
(1) Autonomous Driving

For autonomous driving, efforts are underway to achieve Level 4 (fully autonomous driving under limited conditions) through the implementation of autonomous driving by local governments and private companies, as well as research and development by universities and private companies. There is a shift towards systems that use AI technology, and development of hybrid frame-

works is also underway, integrating traditional robotics approaches which allow for detailed protocol descriptions⁶.

The size of the global autonomous driving market is predicted to exceed 40 billion dollars in 2024 and reach approximately 110 billion dollars by 2029 (**Figure 2-1-7-3**).

Figure 2-1-7-3 The size of the global autonomous driving market



(Source) Prepared based on BNP Paribas (cited from Statista) (data obtained on March 12, 2025)⁷

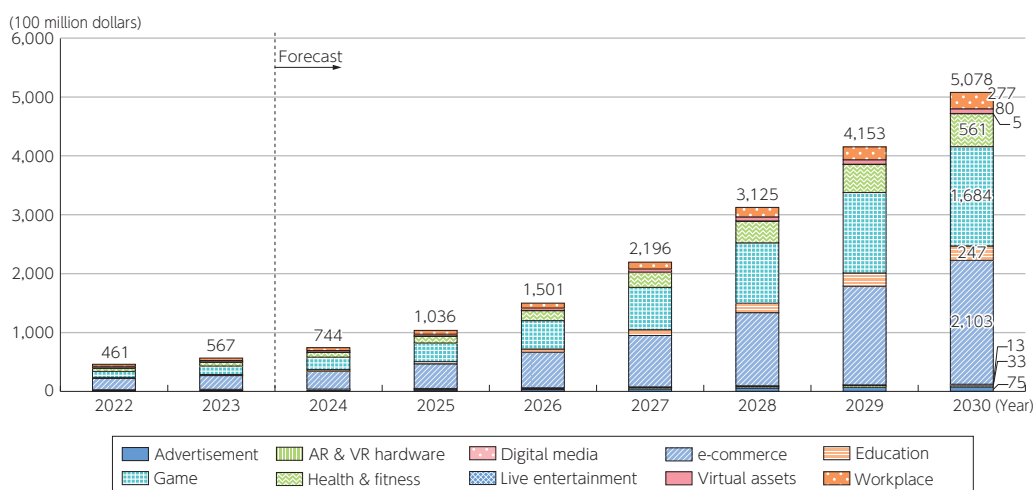
(2) Metaverse

The global metaverse market is forecasted to expand from 74.4 billion dollars in 2024 to 507.8 billion dollars by 2030 (**Figure 2-1-7-4**). The largest segment within the metaverse is e-commerce, followed by games and health and fitness. The market is primarily driven by consumer-oriented metaverse services, rather than the hardware needed to enjoy the metaverse.

The Japanese metaverse market (including metaverse

platforms, content, infrastructure, and XR (VR, AR, MR) devices used in metaverse services)⁸ is expected to reach 275 billion yen in FY2024, a 47.6% increase from the previous fiscal year, and expand to 1.87 trillion yen by FY2028 (**Figure 2-1-7-5**). In the future, the market is expected to expand with the advancement of XR devices, development of AI technology, and increase in awareness of the metaverse.

Figure 2-1-7-4 Changes and forecasts of the size of the global metaverse market



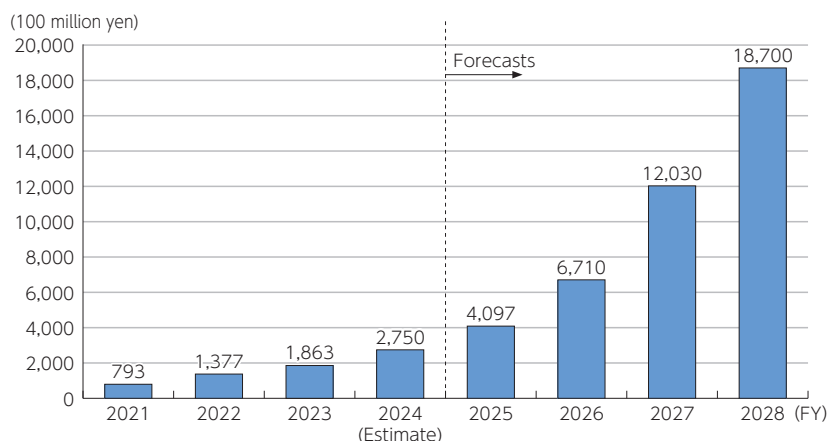
(Source) Prepared based on Statista (data obtained on February 1, 2025)⁹

⁶ https://tier4.jp/media/detail/?sys_id=6UQbLxseKbqGhwFOd0573W&category=NEWS

⁷ <https://www.statista.com/statistics/428692/projected-size-of-global-autonomous-vehicle-market-by-vehicle-type/>

⁸ The figures for platforms, content, and infrastructure are calculated based on sales of business operators, while the figures for XR devices are calculated based on sales prices.

⁹ <https://www.statista.com/outlook/amo/metaverse/worldwide>

Figure 2-1-7-5 Changes and forecasts of the size of the Japan's metaverse market (in terms of sales)

*1 The total market size is the sum of metaverse platforms, content, infrastructure, etc., and XR (VR, AR, MR) equipment used in metaverse services. The figures for platforms, content, and infrastructure, etc. are calculated based on sales of business operators, while the figures for XR equipment are calculated based on sales prices.

*2 The enterprise (corporate) metaverse and consumer metaverse are included in the scope, while game-only metaverse services are excluded.

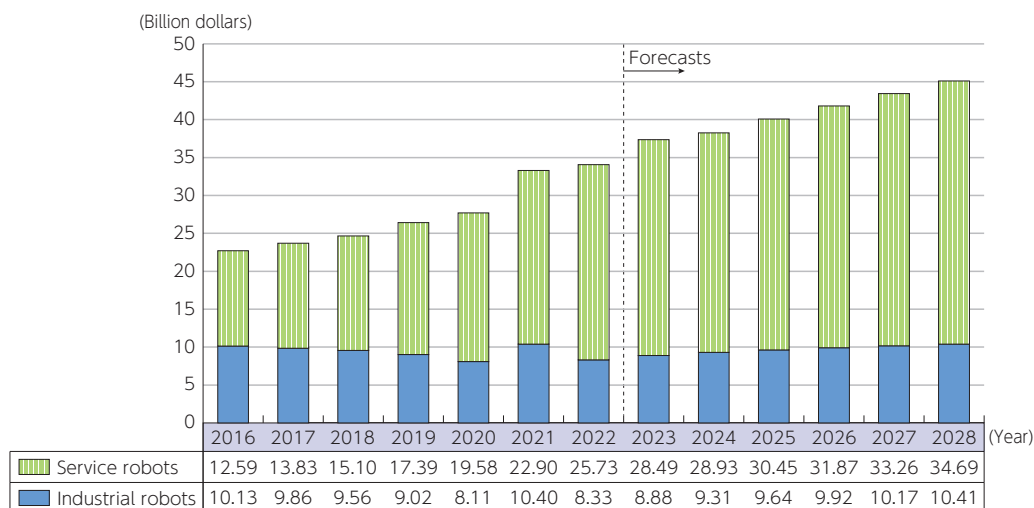
(Source) Yano Research Institute Ltd., "Metaverse Market in Japan: Key Research Findings 2024" (published on December 17, 2024)

(3) Robots

A wide variety of robots are used in various fields, such as among others, industry, home, healthcare, entertainment. In particular, the application of AI technology is expected to lead to the emergence of even more advanced robots.

The global robot market, valued at 34.1 billion dollars in 2022, is projected to grow to 45.1 billion dollars by 2028, representing a compound annual growth rate (CAGR) of 4.8% from 2022 to 2028. Looking at the break-

down, the service robot segment is projected to increase from 25.7 billion dollars in 2022 to 34.7 billion dollars in 2028 (a CAGR of 5.1%), while the industrial robot segment is projected to increase from 8.3 billion dollars in 2022 to 10.4 billion dollars in 2028 (a CAGR of 3.8%). In terms of the trend of the market size since 2016, the service robot segment has been driving the overall growth of the global robot market (**Figure 2-1-7-6**).

Figure 2-1-7-6 Changes and forecasts of the size of the global robot market

(Source) Prepared based on Statista (data obtained on March 12, 2025)¹⁰

¹⁰ <https://www.statista.com/forecasts/1384829/global-robotics-revenue-by-category>

Section 8 Trends in the data center market and cloud services market

1. Data centers

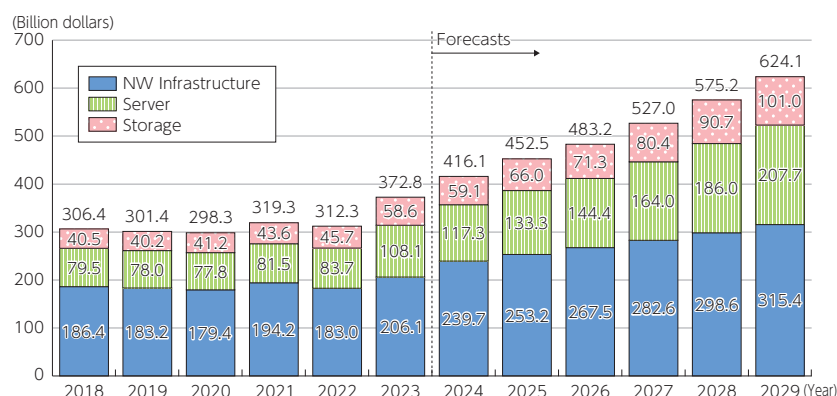
The number of data centers worldwide is overwhelmingly high in the U.S., with 5,426 as of March 2025. The combined total for the 15 countries ranked second and below is 3,975, highlighting the concentration in the U.S. Japan has 222 data centers, which is approximately 4% of the U.S.

The global market size (sales) for data center systems

is expected to reach 416.1 billion dollars in 2024 and expand to 624.1 billion dollars by 2029. Approximately half of the sales is comprised of equipment and services related to network infrastructure (**Figure 2-1-8-1**).

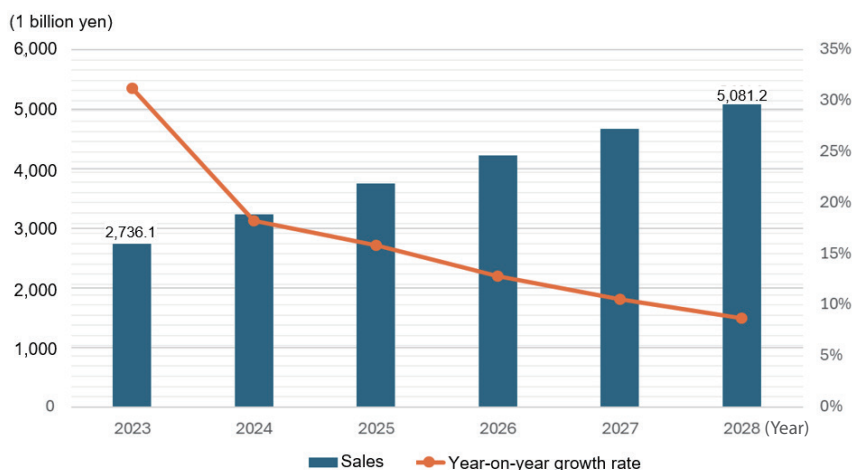
The market size (sales) for data center services in Japan was 2.7361 trillion yen in 2023 and is projected to reach 5.0812 trillion yen by 2028 (**Figure 2-1-8-2**).

Figure 2-1-8-1 Changes and forecasts of the size of the global data center systems market (sales)



(Source) Prepared based on Statista Market Insights (data obtained on February 1, 2025)¹

Figure 2-1-8-2 Changes and forecasts of the size of Japan's data center services market (sales)



* The values for 2023 are actual results, and the values for 2024 onwards are forecasts.

(Source) IDC Japan, October 2024 "Domestic Data Center Service Market Prediction 2024-2028" (JPJ51508524)



Figure (related data) Changes and forecasts of the size of data center systems markets by country (sales)

Source: Prepared based on Statista Technology Market Insights (data obtained on February 1, 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00260>

(Data collection)



Figure (related data) The number of data centers by country and region

Source: Prepared based on Statista (Cloudscene) (data obtained on March 28, 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00261>

(Data collection)

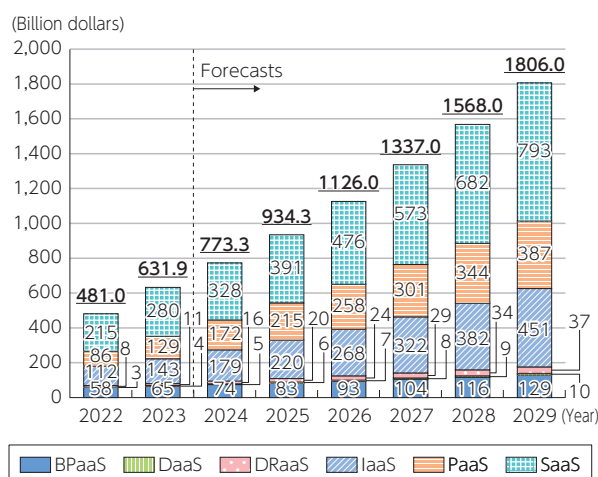
¹ <https://www.statista.com/forecasts/1441973/revenue-data-center-market-for-different-segments-worldwide>

2. Cloud services

The global sales of public cloud services is expected to increase to 773.3 billion dollars in 2024 (a 22.4% increase from the previous year). This is attributed to the essential role of cloud services in business operations and the growing demand towards flexibility and scalability among companies. Moreover, the development of foundational model for generative AI and the growing use of related applications are also driving the market growth. (Figure 2-1-8-3). The share of global expendi-

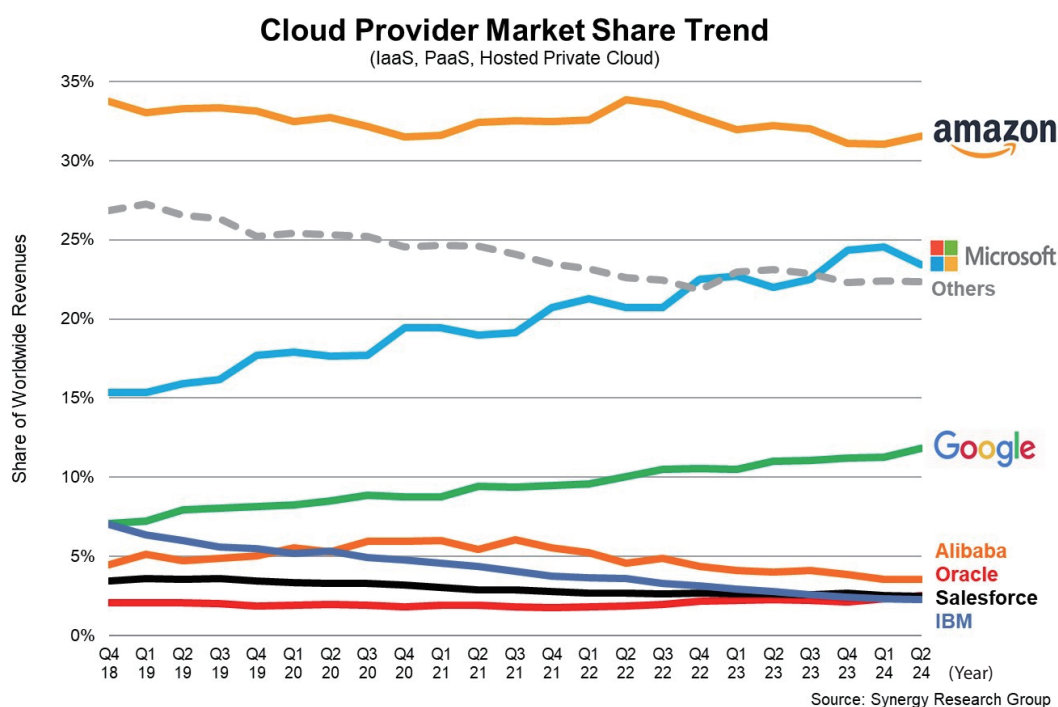
ture on cloud infrastructure services² continues to be dominated by Amazon, followed by Microsoft and Google, with Amazon accounting for approximately 32%, Microsoft 23%, and Google 12% as of the second quarter of 2024. While the market share of Microsoft and Google has been increasing in recent years, the cloud services of the three major companies still hold a large share of the market (Figure 2-1-8-4).

Figure 2-1-8-3 Changes and forecasts of the size of the global public cloud service market (sales)



(Source) Prepared based on Statista Market Insights (data obtained on March 14, 2025)³

Figure 2-1-8-4 Changes in the global market share in cloud infrastructure services



(Source) Synergy "Cloud Market Growth Stays Strong in Q2 While Amazon, Google and Oracle Nudge Higher"⁴

² Total of IaaS, PaaS and hosted private cloud.

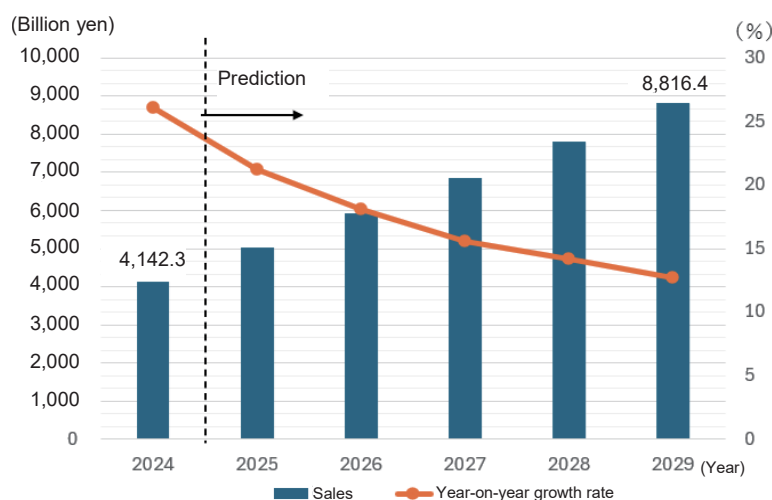
³ <https://www.statista.com/outlook/tmo/public-cloud/worldwide>

⁴ <https://www.srgresearch.com/articles/cloud-market-growth-stays-strong-in-q2-while-amazon-google-and-oracle-nudge-higher>

The public cloud services market in Japan⁵ achieved significant growth, reaching 4.1423 trillion yen in 2024, a

26.1% increase compared to the previous year (Figure 2-1-8-5).

Figure 2-1-8-5 Changes and forecasts of the size of the public cloud service market in Japan (sales)



(Source) IDC Japan, February 2025 "Domestic Public Cloud Service Market Prediction 2025-2029" (JPJ52152425)

3. Edge computing

The global edge computing market size (expenditure) is projected to expand to 227 billion dollars in 2024 and further to 380 billion dollars by 2028 (Figure 2-1-8-6).

In Japan, the edge computing market size (expenditure) is estimated to reach 1.9 trillion yen in 2025 (a 12.9% increase from the previous year) and is expected to grow to 2.6 trillion yen by 2028 (Figure 2-1-8-7).

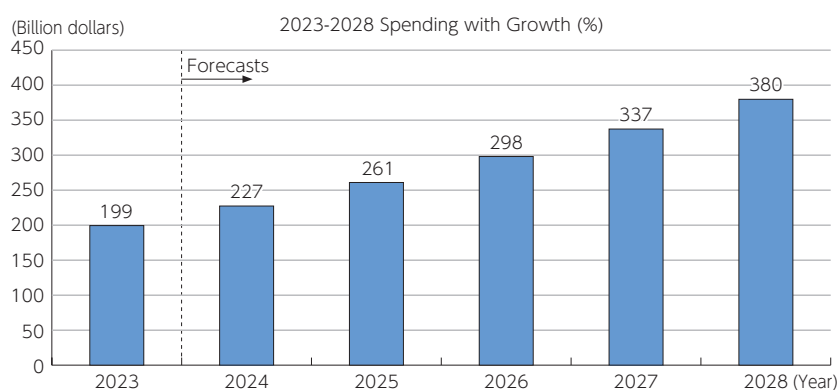
Among edge computing technologies, Multi-access Edge Computing (MEC), which takes mobile communications into account, is a technology that processes data exchanged between the cloud and devices on edge servers (edge data centers) located at the edge of the communication network (near the device) instead of per-

forming computation in the cloud. This approach is expected to help avoid the impact of latency.

MEC services being used and provided in Japan include "docomo MEC"⁶ by NTT Docomo, "AWS Wavelength"⁷ by KDDI, and "5G MEC"⁸ by SoftBank. Major use cases are video transmission and analysis, remote control and operation, real-time energy control, XR, and autonomous driving.

Furthermore, the market for solutions that utilize edge AI⁹ is highly compatible with IoT, therefore it is continuing to expand steadily along with the expansion of the IoT market.

Figure 2-1-8-6 Changes and forecasts of the global market size of edge computing (expenditure)



(Source) Prepared based on IDC "Worldwide Edge Spending Guide 2025 V1"

⁵ Cloud services that specialize in IT-related functions provided to a wide range of users without special regulations or restrictions.

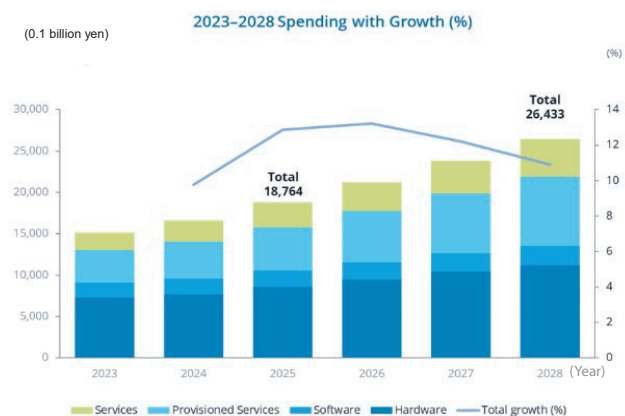
⁶ <https://www.mec.docomo.ne.jp/>

⁷ https://biz.kddi.com/5g/aws_wavelength/

⁸ https://www.softbank.jp/corp/news/press/sbkk/2022/20220526_01/

⁹ Edge AI cameras, edge AI computers and edge AI platforms

Figure 2-1-8-7 Changes and forecasts of the market size of edge computing in Japan (expenditure)



(Source) IDC "Investment in edge computing in the domestic market is predicted to reach 1.9 trillion yen in 2025, up 12.9% from the previous year, and reach approximately 2.6 trillion yen by 2028 - the Forecast for the Domestic Edge Infrastructure Market Announced -" (April 8, 2025)¹⁰



Figure (related data) Changes and forecasts of the market size of the Japanese edge AI solutions (FY2023 - FY2029)
 Source: Deloitte Tohmatsu MIC Research Institute "Reality and Future Prospects of Edge AI Solutions Market - FY2025 Version"
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00270>
 (Data collection)

¹⁰ <https://my.idc.com/getdoc.jsp?containerId=prJPJ53301925>

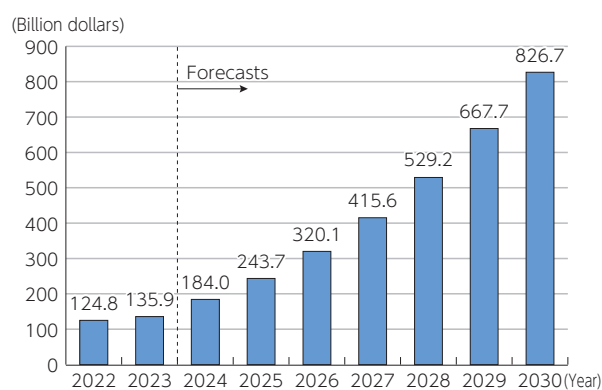
Section 9 Trends in AI

1. Market overview

The global AI market size (sales) is expected to expand to 184 billion dollars in 2024 and 826.7 billion dollars by 2030 (Figure 2-1-9-1). The market size for AI systems¹ in Japan (expenditure) is projected to reach

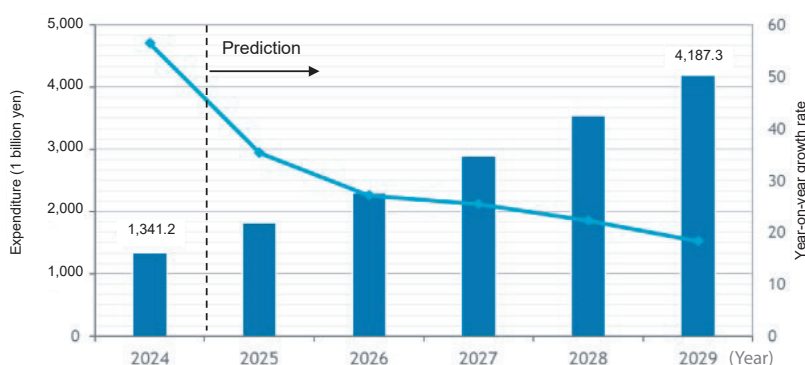
1.3412 trillion yen in 2024, a 56.5% increase from the previous year, and continue growing to 4.1873 trillion yen by 2029 (Figure 2-1-9-2).

Figure 2-1-9-1 Changes and forecasts of the size of the global AI market (sales)



(Source) Prepared based on Statista (data obtained on March 27, 2025)²

Figure 2-1-9-2 Changes and forecasts of the size of the AI market in Japan (expenditure)



(Source) IDC "Announced Market Prediction of Domestic AI System in 2024" (May 1, 2025)³

The social adoption of AI is advancing, and generative AI, which creates text, images, audio, and video, is gaining attention. The global generative AI market is expected to expand from 20.5 billion dollars in 2023 to 36.1 billion dollars in 2024 (19.6% of the total AI market) and to 356.1 billion dollars by 2030 (43.1% of the total AI market). This growth is driven by the rapid adoption of many models and services such as Gemini, Copilot, and DeepSeek, following the release of ChatGPT in 2022. Companies are increasingly using generative AI for a

variety of purposes, including programming, text summarization, marketing, call centers and customer support, as well as the creation of illustrations and posters. While it was mainly used to address labor shortages and improve business efficiency, going forward, it is expected to be increasingly used to create new services. In addition, the advancement of AI agents⁴ and the physical intelligence⁵ that utilize generative AI technology is also expected to further drive the market expansion (Figure 2-1-9-3).

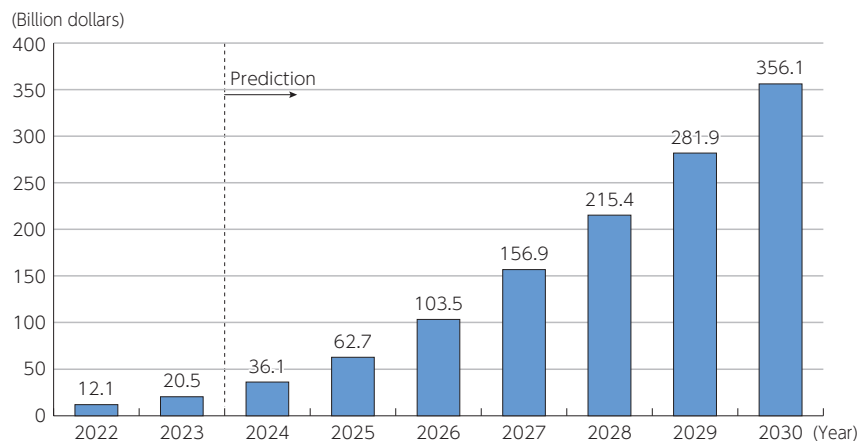
¹ Hardware and software platforms for using AI functions and IT services related to the construction of AI systems

² <https://www.statista.com/forecasts/1474143/global-ai-market-size>

³ <https://my.idc.com/getdoc.jsp?containerId=prJPJ53362125>

⁴ AI systems that autonomously perform specific tasks without human intervention

⁵ Systems realized through advanced integration of AI and machinery (robots, etc.)

Figure 2-1-9-3 Changes and forecasts of the size of the global generative AI market

(Source) Prepared based on Statista (data obtained on March 27, 2025)⁶

2. Trends in AI by country

AI research is being conducted across the globe. According to AIRankings, which publishes leading countries, companies, and universities based on the number

of research papers and other factors, the top countries are the U.S., China, the UK, Germany, in the respective order, with Japan ranking 11th or 12th in recent years.

**Figure (related data) Changes of AI rankings by country (top 15)**

Source: Prepared based on AIRankings (data obtained on February 25, 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00274>

(Data collection)

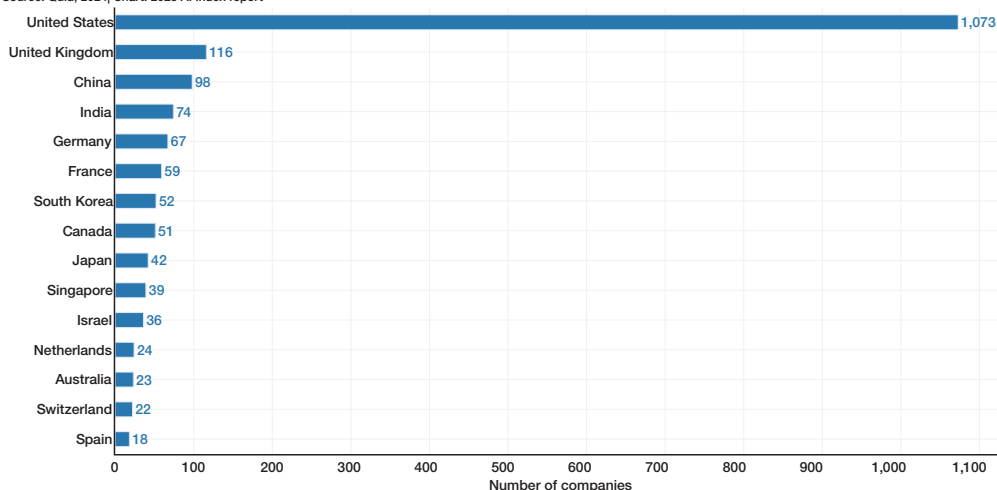
Investment in AI-related companies is also increasing. According to Stanford University's "Artificial Intelligence Index Report 2025," the number of AI companies that received new funding in 2024 was highest in the

U.S. (1,073 companies), followed by the U.K. (116 companies), and Japan ranked 9th with 42 companies (**Figure 2-1-9-4**).

Figure 2-1-9-4 Number of newly funded AI companies by country in 2024

Number of newly funded AI companies by geographic area, 2024

Source: Quid, 2024 | Chart: 2025 AI Index report



(Source) Stanford University "Artificial Intelligence Index Report 2025"⁷

⁶ <https://www.statista.com/forecasts/1449838/generative-ai-market-size-worldwide>

⁷ https://hai-production.s3.amazonaws.com/files/hai_ai_index_report_2025.pdf

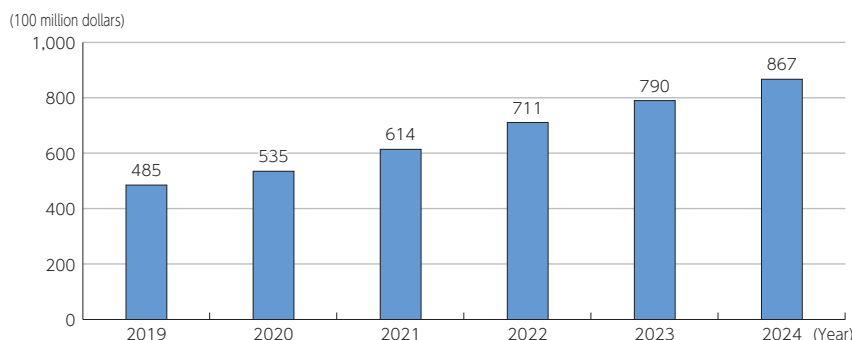
Section 10 Trends of cybersecurity

1. Market overview

The global market for cybersecurity has remained robust, reaching 86.7 billion dollars in 2024, representing a

9.7% increase from the previous year (**Figure 2-1-10-1**).

Figure 2-1-10-1 Changes in the global cybersecurity market size



(Source) Prepared based on Canalis data

As for the major players in the cybersecurity market, Palo Alto Networks, Cisco, and Fortinet held the top three global market shares since 2019, however, as of the second quarter of 2024, Microsoft has replaced Cisco and entered the top three. In recent years, Palo Alto Networks, which holds the top share, has been expand-

ing its market share, approaching 10%. Microsoft has also been rapidly expanding its share in recent years, and is gaining recognition in this field, for features such as the ease of implementation, as it offers advanced security features such as Microsoft 365 E5 Security as part of its Microsoft 365 series.



Figure (related data) Major global cybersecurity companies

Source: Prepared based on Canalis data

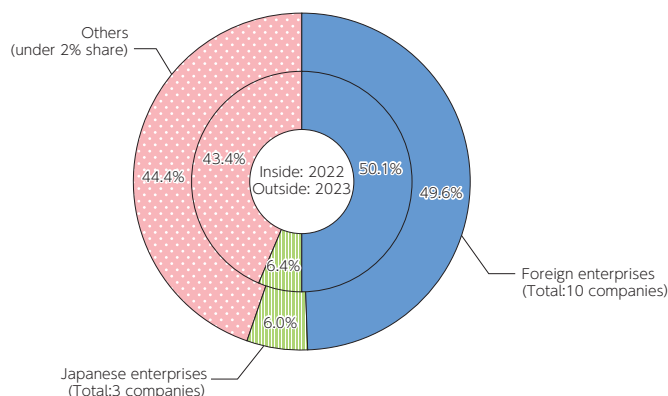
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00277>

(Data collection)

In 2023, the domestic market for information security products (sales) in Japan reached 557.404 billion yen, a 12.0% increase from the previous year. By functional market segments of security products, the sales of security software, including endpoint security software and network security software, accounted for 89.1% of the total market at 496.511 billion yen in 2023, while security appliances, including content management, UTM, and VPN, accounted for 10.9% at 60.893 billion yen.

Furthermore, the domestic market share of information security product vendors (sales) in 2022 and 2023 was categorized into “Foreign Companies” and “Domestic Companies” for those with a market share of 2% or more, and the sales amounts of those companies were calculated for 2022 and 2023. The results showed that foreign companies held a share of over 50% for both years, indicating that a significant portion of Japan’s cybersecurity products rely on overseas sources (**Figure 2-1-10-2**).

Figure 2-1-10-2 Domestic information security products market share (sales) (2022 and 2023)



(Source) Prepared based on IDC Japan, April 2025 “Japan IT Security Products Market Shares in the 1st Half of 2024: The Growing SaaS Security Market” (JPJ50704524)

2. Current status of cybersecurity

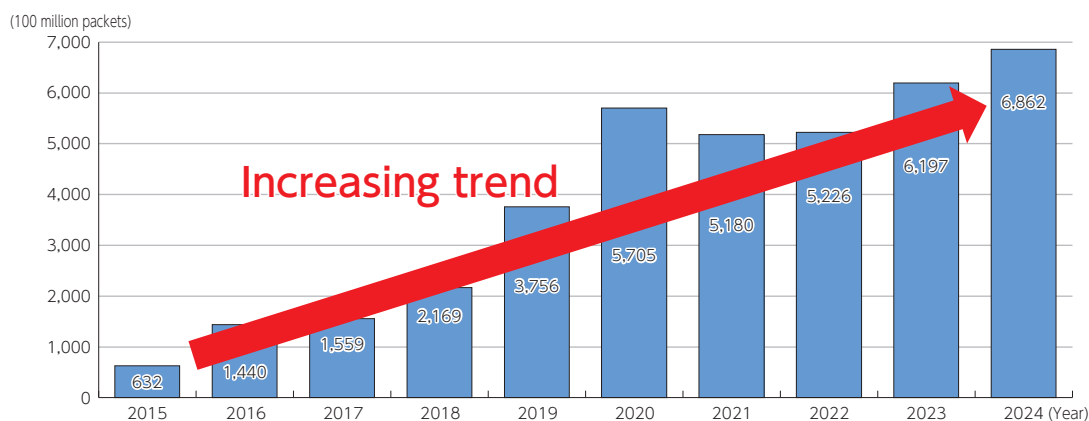
(1) The increasing threat of cybersecurity

The large-scale cyberattack observation network (NICTER), which is operated by the NICT, observed a total of approximately 686.2 billion packets through darknet monitoring in 2024, a 10.86-fold increase compared with 2015 (approximately 63.2 billion packets). This indicates that a significant number of observation packets are still being received. (Figure 2-1-10-3). In

addition, the total observed packet count in 2024 corresponds to an observation occurring approximately every 13 seconds for each IP address.

It should be noted that 2024 has recorded the highest number of observations to date, and the observation packets flying around the Internet are even more active compared with 2023.

Figure 2-1-10-3 Changes in the number of cyberattack-related communications detected by NICTER

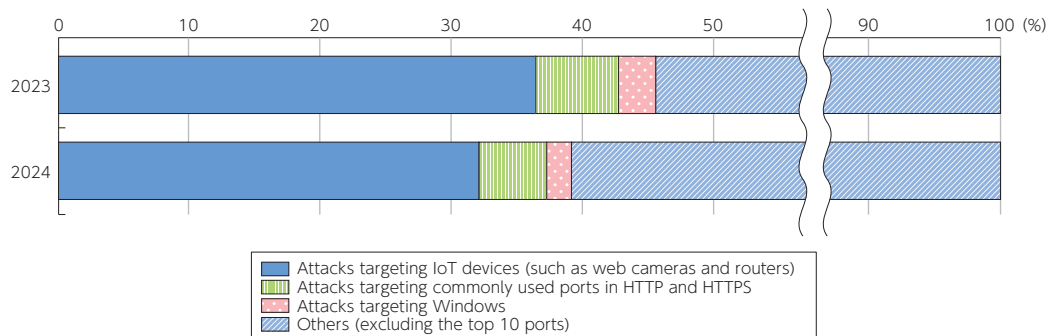


(Source) Prepared based on NICT "NICTER Observation Report 2024"

Furthermore, the observed communications related to cyberattacks in NICTER shows that, similar to 2023, communications targeting IoT devices were most frequently observed, accounting for about 30% of all cyber-

attack-related communications. The next most frequently observed attacks were on ports used by HTTP and HTTPS (Figure 2-1-10-4).

Figure 2-1-10-4 Targets of cyberattack-related communications detected by NICTER



(Source) Prepared based on NICT "NICTER Observation Report 2024"

In 2024, there were 563 cases of violations of the Act on Prohibition of Unauthorized Computer Access (hereinafter referred to as the "Unauthorized Computer Ac-

cess Prohibition Act"), an increase of 42 cases from the previous year.



Figure (related data) Changes in arrests for violation of the Unauthorized Computer Access Prohibition Act

Source: Prepared based on the National Police Agency, the MIC and the METI "Status of Unauthorized Access Activities and Research and Development of Access Control Technology",
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00283>
(Data collection)

(2) Economic losses caused by cybersecurity issues

Various organizations have conducted research and analysis on the economic losses caused by cybersecurity issues (Figure 2-1-10-5). The numerical values vary depending on the scope of the losses, but for example,

according to a survey conducted by Trend Micro in 2024, the average cumulative damage caused by cyberattacks experienced by corporate organizations over the past three years was approximately 171 million yen.

Figure 2-1-10-5 Economic losses caused by cybersecurity issues

Investigation/analysis entity	Target area	Period covered	Overview of economic loss	Amount of loss
Trend Micro	Japan	2024 [research period]	Average cumulative damage amount for corporate organizations that experienced damage from cyber attacks in the past three years	171 million yen (an increase of approximately 4.6 million yen from the previous year)
National Police Agency	Japan	First half of 2024	Total investigation and recovery costs associated with ransomware damage	25%: <1 million yen 21%: 1 million to <5 million yen 8%: 5 million to <10 million yen 27%: 10 million to <50 million yen 19%: ≥ 50 million yen or more
FBI	The U.S.	2023	Total amount of reported damage by cybercrime incidents	12.5 billion dollars (a 22% increase from the previous year)
Sophos	14 countries (North America, Central and South America, Europe, Asia Pacific)	2024	Ransom paid per organization to recover from a ransomware attack	• Average: Approximately 3.96 million dollars (a 2.6-fold increase from the previous year) • Median: 2 million dollars (a 5-fold increase from the previous year)
			Average annual cost per organization to recover from a ransomware attack (excluding ransom payment)	2.73 million dollars
IBM	World	2024	Global average cost of single data breach for an organization	4.88 million dollars
Statista	World	2018 - 2029	Estimated global cost of cybercrime	9.22 trillion dollars in 2024 15.63 trillion dollars in 2029

(Source) Prepared based on published materials

(3) Trends in wireless LAN security

According to a survey conducted by the MIC¹ in November 2024 to understand the security awareness among wireless LAN users, the recognition of public wireless LAN is high (approximately 92%), but only about half of the respondents actually use it. The most common reason for not using public wireless LAN is “Security Concerns”, cited by about 60% of respondents. Among users of public wireless LAN, nearly 90% feel “Security Concerns”, with many users citing information theft and unauthorized access from outside as their particular concerns.

Public Wi-Fi that supports OpenRoaming² uses technology to encrypt communications and prevent connections to fake public Wi-Fi, allowing users to safely use public Wi-Fi. In addition, once a user registers to use OpenRoaming, the user can use any public Wi-Fi that supports OpenRoaming around the world without any additional settings. In Japan, OpenRoaming is being introduced in urban areas such as Tokyo and Osaka, and the number of public Wi-Fi networks that support OpenRoaming is expected to expand gradually.

(4) Adoption status of sender domain authentication technologies

As of September 2024, the adoption status of sender domain authentication technologies in the JP domain for preventing spoofed emails is approximately 88.4% for

SPF and approximately 32.6% for DMARC, both showing an increase.



Figure (related data) Adoption status of sender domain authentication technologies in the JP domain

Source: Compiled by the MIC with the cooperation of four telecommunications companies

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00283>

(Data collection)

¹ https://www.soumu.go.jp/main_sosiki/cybersecurity/wi-fi/

² An international Wi-Fi Roaming platform supported by the Wireless Broadband Alliance, a global organization that introduces and promotes the latest Wi-Fi technologies and services.

Section 11 Trends in digital usage

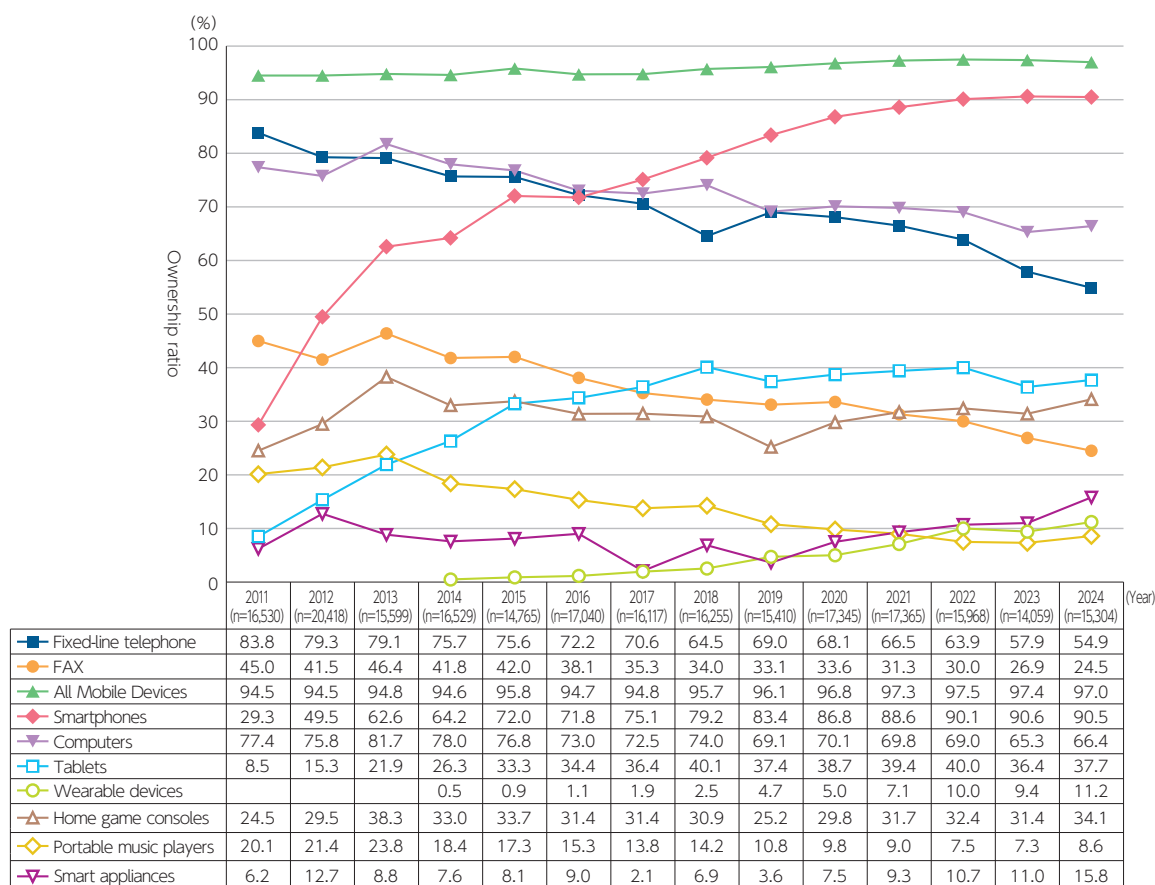
1. Trends in digital usage in the daily life of the citizens

(1) Information and communication devices and terminals

Regarding the terminals necessary for connecting to the Internet and utilizing digital services, the household ownership rate of information and communication devices in 2024 was 97.0% for “All Mobile Devices,” with

“Smartphones” accounting for 90.5% of that figure. Additionally, the ownership rate for personal computers was 66.4% (Figure 2-1-11-1).

Figure 2-1-11-1 Changes in the rate of household ownership of ICT devices



* Includes no responses

(Source) MIC “Communications Usage Trend Survey”¹

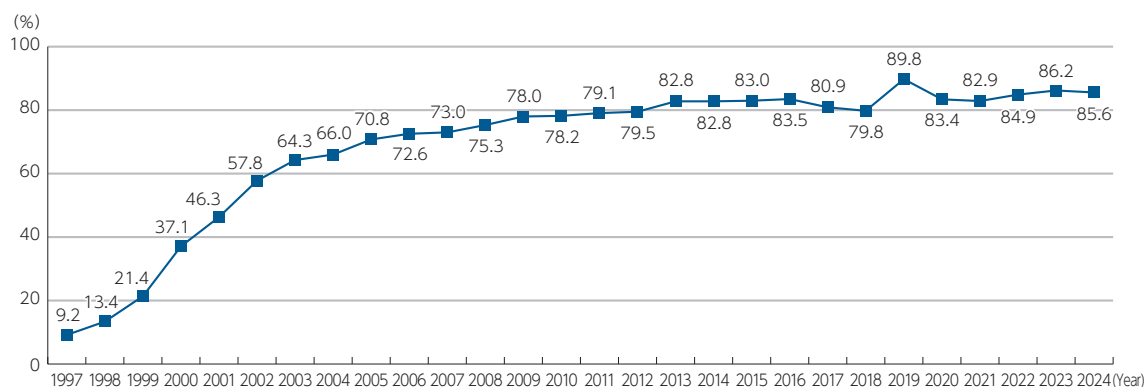
(2) Internet

A Usage status

The Internet usage rate (individual) in 2024 was 85.6% (Figure 2-1-11-2). When broken down by device, the Internet usage rate (individual) for “Smartphones”

(74.4%) surpassed that for “Personal Computers” (46.8%) by 27.6 percentage points.

¹ <https://www.soumu.go.jp/johotsusintokei/statistics/statistics05.html>

Figure 2-1-11-2 Changes in Internet usage rate (individuals)²

(Source) MIC "Communications Usage Trend Survey"



Figure (related data) Device types of Internet use (individuals)

Source: MIC "Communications Usage Trend Survey"

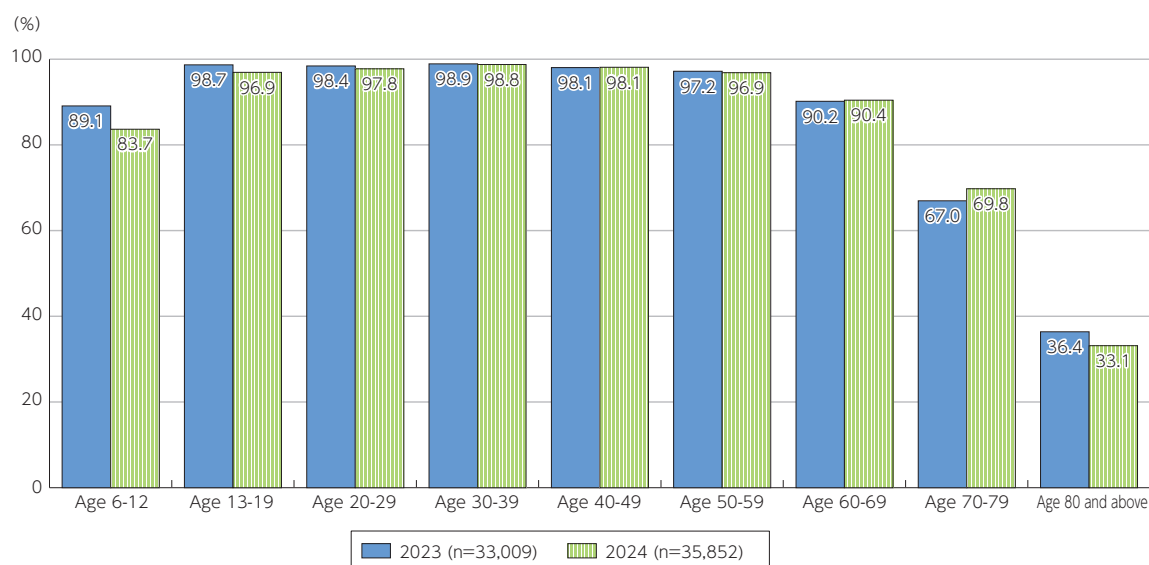
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00294>

(Data collection)

Examining the Internet usage rate by age group, it exceeds 90% for each group from ages 13 to 69, while it tends to decrease as the age group rises beyond 70 years old (Figure 2-1-11-3). Additionally, the Internet usage rate by household income shows that it exceeded

80% for all income brackets above 4 million yen (Figure 2-1-11-4). Furthermore, by prefecture, 38 prefectures had an Internet usage rate exceeding 80%, and in all prefectures, the usage rate for smartphones exceeded 60%.

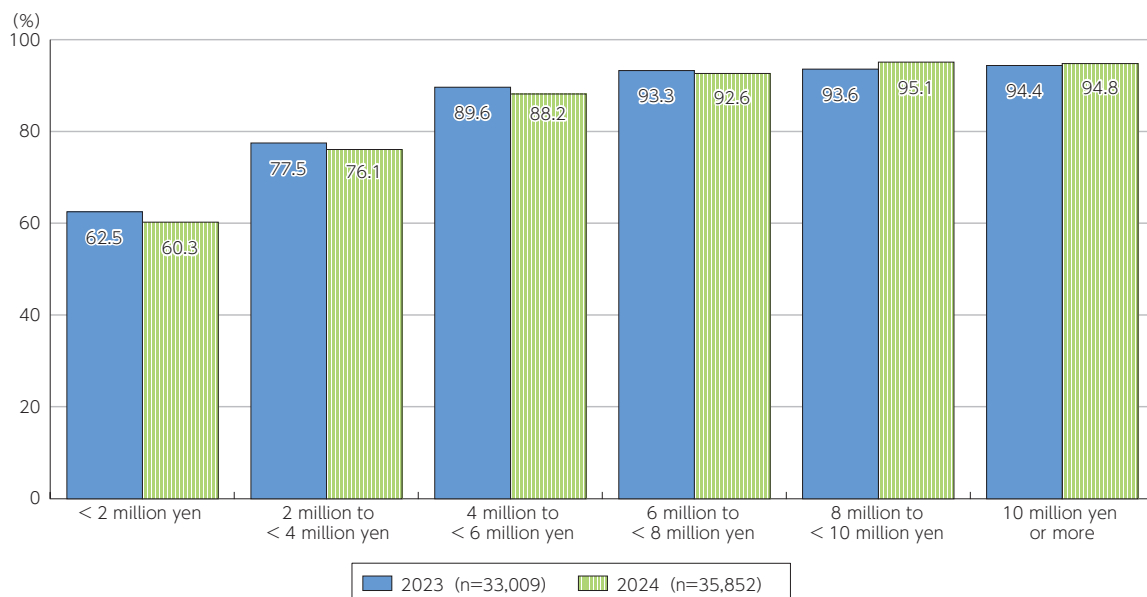
Figure 2-1-11-3 Internet usage rate by age group



(Source) MIC "Communications Usage Trend Survey"

² The design of the questionnaire in the 2019 survey was partially different from that in previous years, so care should be taken when comparing data across years.

Figure 2-1-11-4 Internet usage rate by annual household income



(Source) MIC "Communications Usage Trend Survey"



Figure (related data) Rate of Internet usage by prefecture and the status of usage by device (individuals) (2024)

Source: MIC "Communications Usage Trend Survey"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00297>

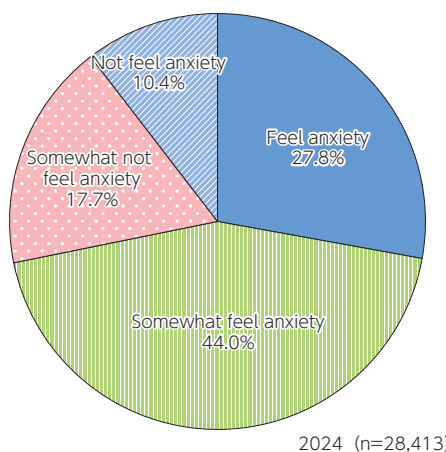
(Data collection)

B Concerns about Internet usage

Approximately 70% of Internet users felt some form of anxiety when using the Internet (**Figure 2-1-11-5**). The specific concerns included "Leakage of Personal Information and Internet Usage History" at 90.2%, fol-

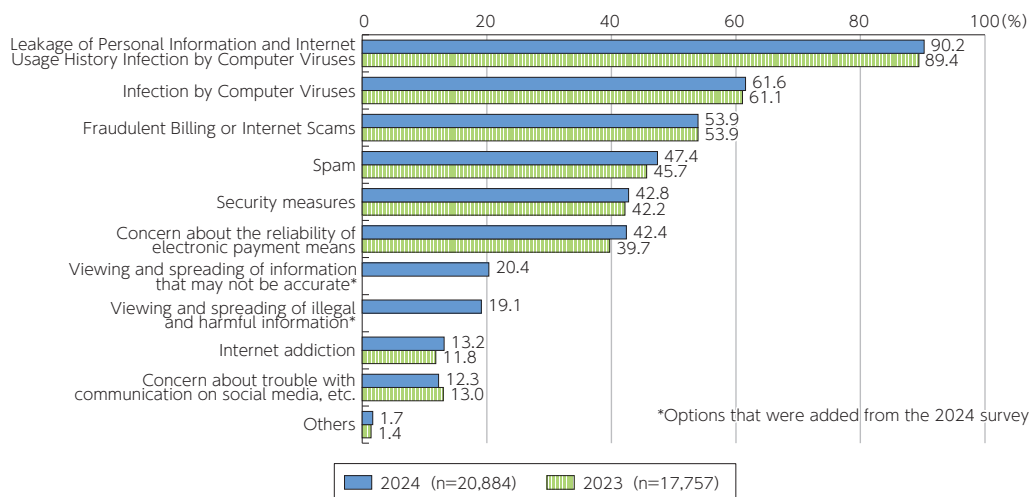
lowed by "Infection by Computer Viruses" at 61.6%, and "Fraudulent Billing or Internet Scams" at 53.9% (**Figure 2-1-11-6**).

Figure 2-1-11-5 Percentage of individuals who feel anxiety when using the Internet



(Source) MIC "Communications Usage Trend Survey"

Figure 2-1-11-6 Anxiety felt when using the Internet (multiple answers allowed)



(Source) MIC "Communications Usage Trend Survey"

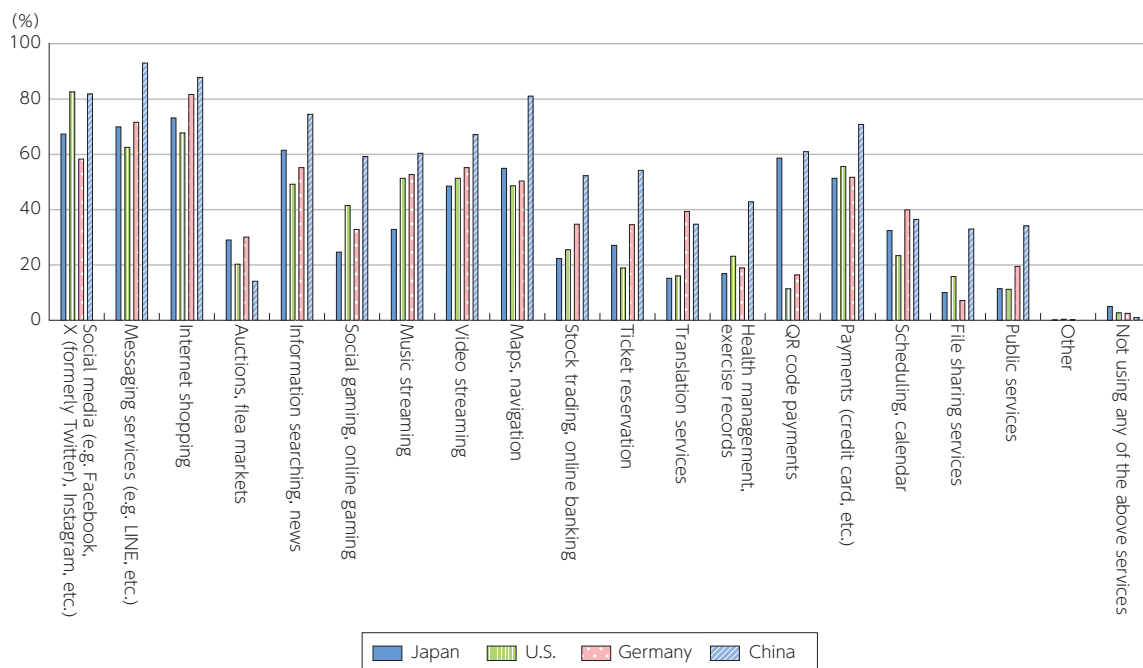
(3) Utilization of digital services

A General utilization of digital services

A survey was conducted in Japan, the U.S., Germany, and China regarding the digital services people commonly use. In Japan, the services with over 60% usage included "Internet Shopping," "Messaging Services," "Social Media," and "Information Search and News," which were higher compared with other services. The

relatively high usage of "QR Code Payments" in Japan can be attributed to the widespread use of smartphones, promotional campaigns by QR code payment providers, government initiatives to promote cashless transactions, and support for small and medium-sized enterprises (Figure 2-1-11-7).

Figure 2-1-11-7 Status of overall usage of digital services



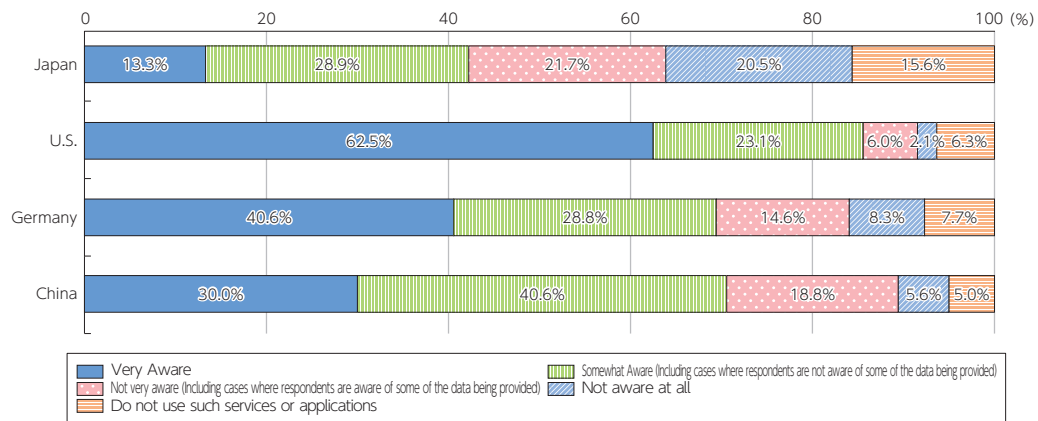
(Source) MIC (2025) "Survey Research on R&D on the Latest Information and Communications Technologies and Trends of Use of Digital Technologies in Japan and Abroad"

Additionally, when asked whether they were aware of providing personal data when using services or applications offered by platform companies, the percentage of respondents who answered "Aware" (sum of "Very Aware" and "Somewhat Aware") was highest in the U.S. (85.6%), while in Japan it was 42.2% (Figure 2-1-11-8).

When asked about their concerns, the most common

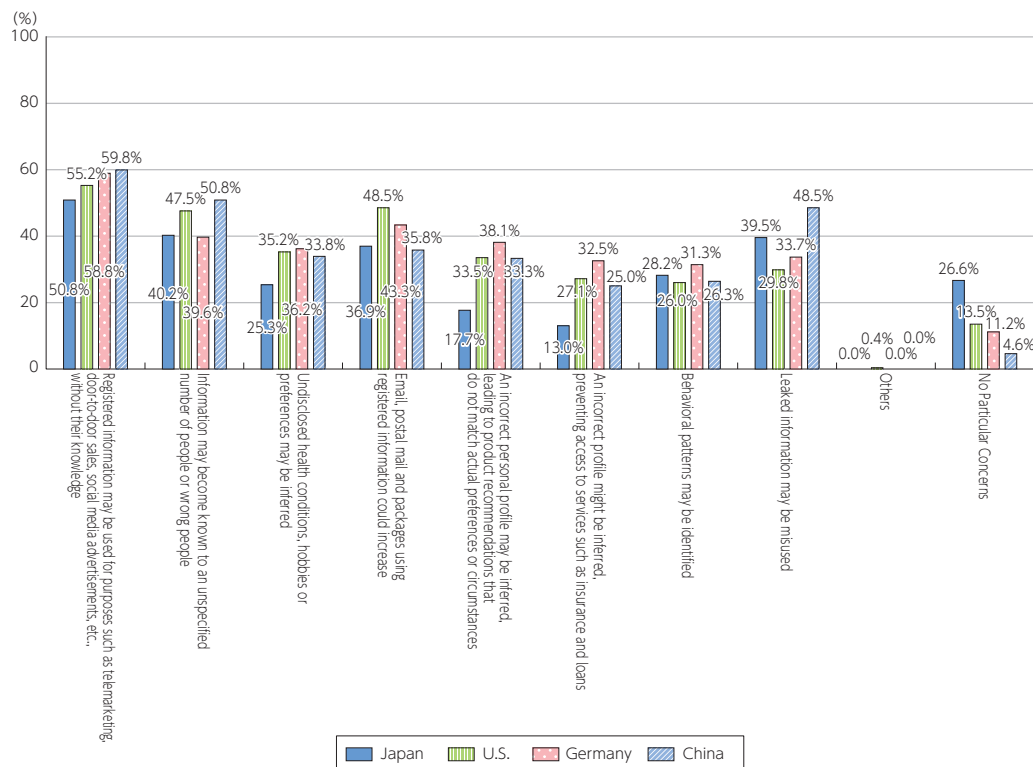
concern across all countries, including Japan, was that "registered information may be used for purposes such as telemarketing, door-to-door sales, social media advertisements, etc., without their intention." On the other hand, the percentage of respondents in Japan who answered "No Particular Concerns" was 26.6%, which was higher than other countries (Figure 2-1-11-9).

Figure 2-1-11-8 Awareness concerning the provision of personal data



(Source) MIC (2025) "Survey Research on R&D on the Latest Information and Communications Technologies and Trends of Use of Digital Technologies in Japan and Abroad"

Figure 2-1-11-9 Concerns regarding services which require the provision of personal data



(Source) MIC (2025) "Survey Research on R&D on the Latest Information and Communications Technologies and Trends of Use of Digital Technologies in Japan and Abroad"

When asked about the conditions under which they would be willing to provide personal data to platform companies, the number of respondents who chose "no worry about the data being leaked," "no worry about companies misusing data," and "protection of privacy is

ensured" was particularly high in Japan compared to other countries. The increase in opportunities to provide personal data and to set conditions for its use may have raised awareness among users.



Figure (related data) Conditions under which users are willing to provide personal data

Source: MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

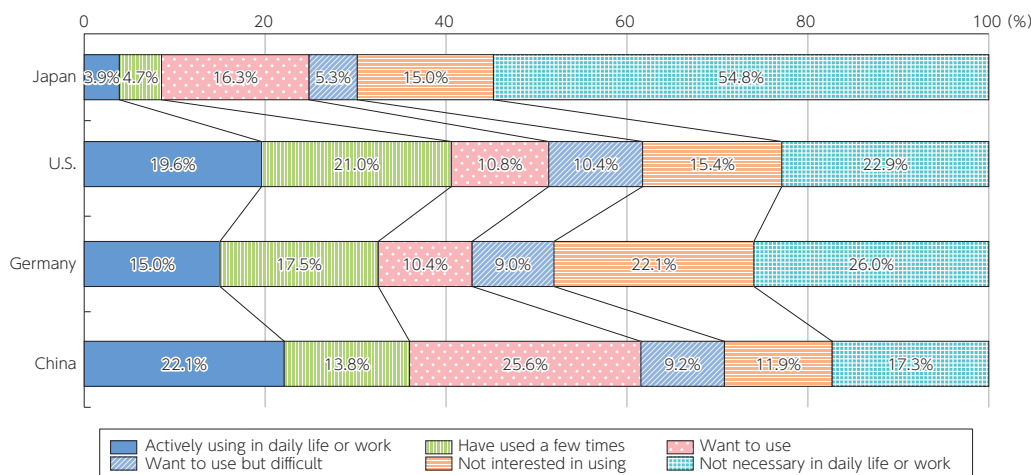
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00303>
(Data collection)

B Utilization of digital services in virtual spaces (XR content)

The percentage of respondents who have used experiential entertainment services in virtual spaces³ (sum of “Actively Using in Daily Life or Work” and “Have Used a Few Times”) was about 30-40% in the U.S., Germany, and China, while in Japan it was significantly lower at 8.5%. The percentage of respondents who indicated low intention to use such services (sum of “Not Necessary

in Daily Life or Work” and “Not Interested in Using”) was 69.8% in Japan, which was higher than other countries (Figure 2-1-11-10). Looking at the usage in Japan by age group, the usage rate was highest among respondents in their 40s (12.1%), and the percentage of those who “Want to Try Using It in the Future” was highest among respondents in their 20s (25.7%).

Figure 2-1-11-10 Usage of experiential entertainment services in virtual spaces (comparison by country)



(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”



Figure (related data) Usage of experiential entertainment services in virtual spaces (by age)

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00305>

(Data collection)



Figure (related data) Reasons why people do not use entertainment services in virtual spaces

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00306>

(Data collection)

C Media usage time

Since 2012, the MIC’s Institute for Information and Communications Policy has been conducting joint research with Professor Emeritus HASHIMOTO Yoshiaki of the University of Tokyo, Professor KITAMURA Satoshi of Tokyo Keizai University, and others⁴ on the us-

age time, time slots, purposes, and reliability of information and communication media⁵. Below is an overview of the usage time of information and communication media based on the FY2024 survey results⁶.

³ XR content (experiential entertainment services in virtual space) is a type of services in which users have interactive relationships with others in real-time, such as online games and virtual events.

⁴ Assistant Professor KAWAI Daisuke in School of Cultural and Creative Studies in Aoyama Gakuin University

⁵ “Survey on Usage Time of Information and Communications Media and Information Behavior”: 1,800 men and women aged 13 to 79 (selected by sex and age group (in 10 years increments) in proportion to the actual situation in the Basic Resident Register; the register of January 2024 was used for the FY2024 survey) were visited and received questionnaires based on random location quota sampling. The FY2024 survey was conducted from December 2 to December 8, 2024.

⁶ In the past, the survey targeted 1,500 people between the ages of 13 and 69, but the 2024 survey targeted 1,800 people, including those in their 70s, and therefore the figures for “all age groups” are calculated as the overall figures for those between the ages of 13 and 79. Accordingly, figures for “all age groups” from past survey results have been recalculated to include figures for those in their 70s, which had previously been surveyed and collected for reference purposes, and therefore those figures may not necessarily match the figures of the survey results published until last year.

(A) Average usage time⁷ and user rate⁸ of major media

The average usage time and user rate of “Real-time TV Viewing,”⁹ “Recorded TV Viewing,” “Internet Usage,”¹⁰ “Newspaper Reading,” and “Radio Listening” are shown in (Figure 2-1-11-11).

The FY2024 survey results showed that for all age groups combined, the average usage time for “Internet Usage” was the longest on both weekdays and holidays, followed by “Real-time TV Viewing.” The user rate for “Internet Usage” exceeded that of “Real-time TV Viewing” on both weekdays and holidays.

By age group, the average usage time for “Internet Usage” on holidays exceeded that of “Real-time TV Viewing” for the first time among those in their 40s. The user rate for “Internet Usage” exceeded that of “Real-time TV Viewing” on both weekdays and holidays for those in their teens to 50s. Additionally, the user rate for “Newspaper Reading” increased with age from the 20s, but compared with the previous FY2023 survey results, the user rate for those in their 40s to 70s either decreased or remained almost flat.

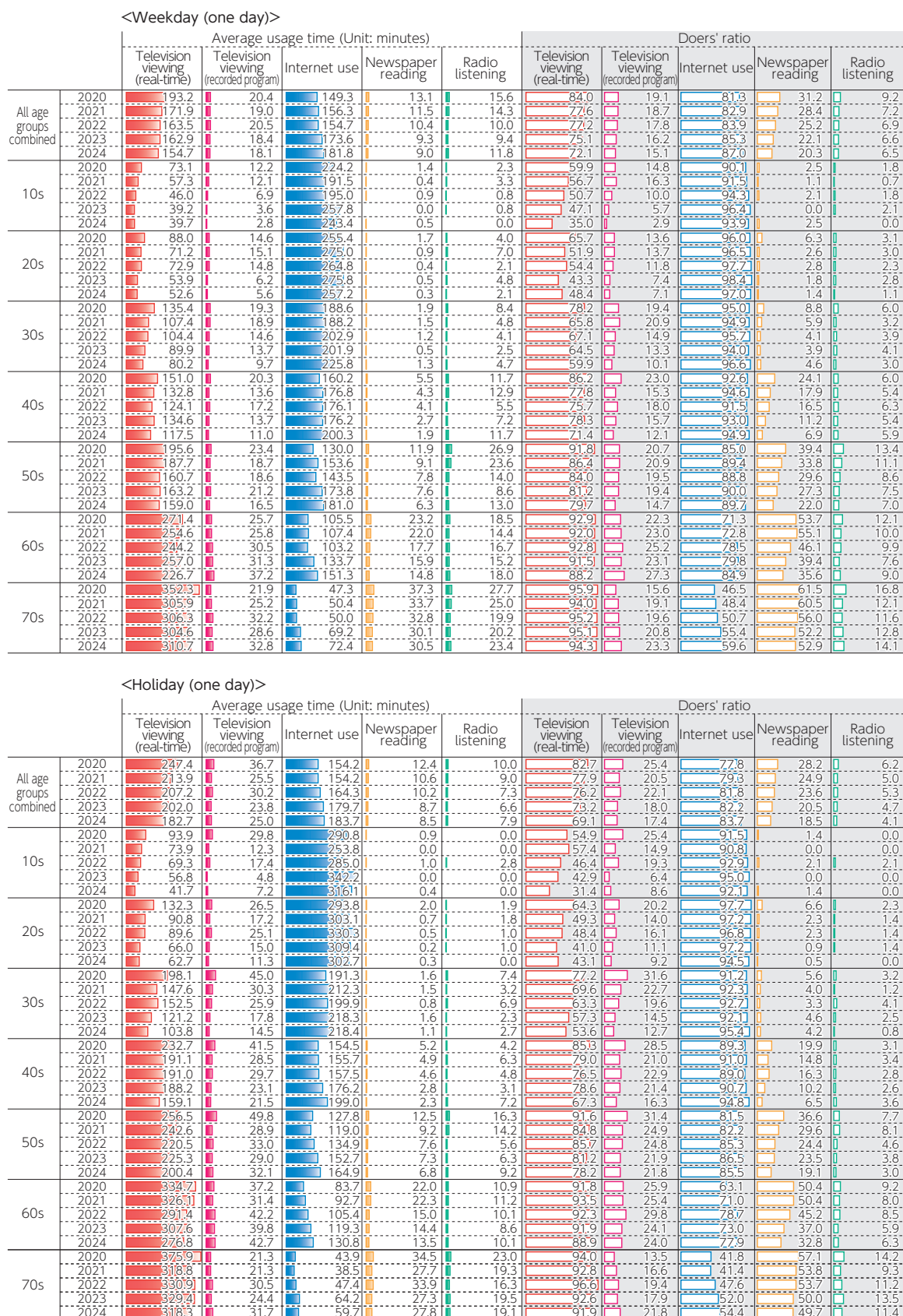
⁷ The total number of hours of all people surveyed for a particular information behavior per survey day, divided by the number of people surveyed. The average time is calculated by including the respondents who did not do the activities throughout the day.

⁸ For weekdays, the ratio of people who performed a particular information behavior for each day of the two survey days was calculated and averaged over the two days. For holidays, this is the ratio of survey days.

⁹ Television viewing (real-time): Real-time television viewing with any device not limited to TV receiver.

¹⁰ Internet use: The use of services over an Internet connection, including email, website, social media, video sites, and online games, regardless of device.

Figure 2-1-11-11 Average usage time and user rate of major media



(Source) MIC Institute for Information and Communications Policy "FY2024 Survey on Usage Time of Information and Communications Media and Information Behavior"

(B) Position of the Internet as a medium

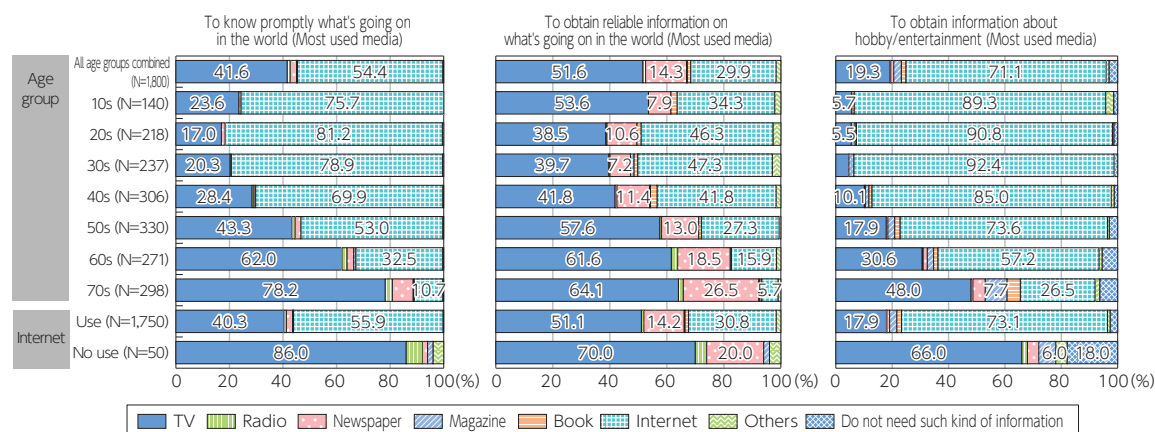
The comparison of the Internet with other media for different usage purposes is shown in (Figure 2-1-11-12).

The Internet was the most used medium for “quickly knowing about events and trends in the world” for all age groups combined. By age group, the “Internet” was most used by those in their teens to 50s, while “TV” was most used by those in their 60s and 70s. For “obtaining reliable information about events and trends in the world,” “TV” was the most used medium for all age groups combined. By age group, the “Internet” was most used by those in their 20s and 30s, “TV” and the

“Internet” were equally used by those in their 40s, and “TV” was most used by other age groups. “Newspapers” were used more than the “Internet” by those in their 60s and 70s.

For “obtaining information about hobbies and entertainment,” the “Internet” was the most used medium for all age groups combined. By age group, the “Internet” was most used by those in their teens to 60s, and “TV” was most used by those in their 70s. The percentage of “Internet” usage was around 90% for those in their teens to 30s.

Figure 2-1-11-12 Media used by purpose (most used media by all groups, by age group and by using or not using the Internet)



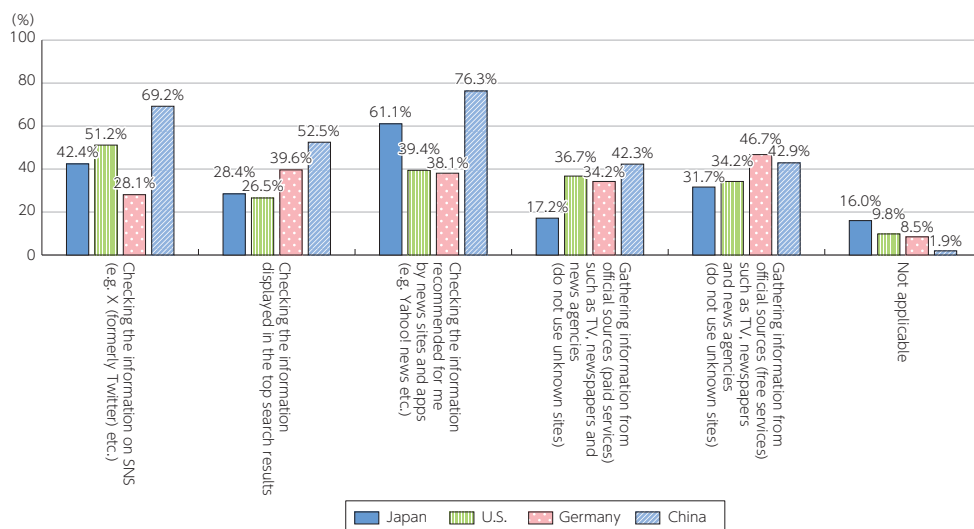
(Source) MIC Institute for Information and Communications Policy “FY2024 Survey on Usage Time of Information and Communications Media and Information Behavior”

D Utilization of Internet media, etc.

When asked about their actions when they want to know the latest news online, the percentage of respondents in Japan who “look at recommended information from news sites/apps” (61.1%) and “look at information

on social media” (42.4%) was high, while relatively fewer people relied on traditional mass media such as TV, newspapers, and news agencies (Figure 2-1-11-13).

Figure 2-1-11-13 Ways to obtain the latest news online (by country)

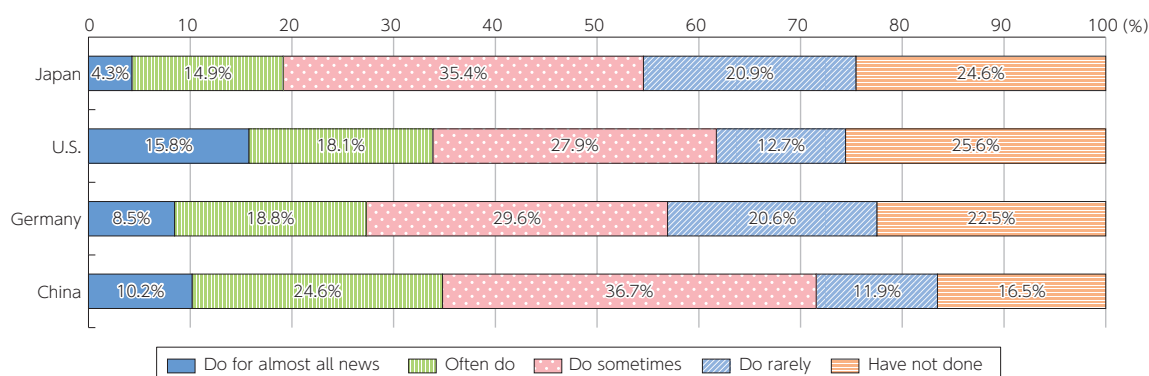


(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

When asked whether they check the source (organization or individual) of the information flowing online, the percentage of respondents in Japan who answered

that they do (sum of “Do for Almost All News” and “Often Do”) was 19.1%, lower compared with other countries (Figure 2-1-11-14).

Figure 2-1-11-14 Frequency of checking the source of information (organizations and individuals) (by country)



(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”



Figure (related data) The proportion of comparing news reports from multiple media (broadcasters, news media and news agencies)

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00320>

(Data collection)



Figure (related data) The proportion of checking official information announced by the government etc.

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00321>

(Data collection)



Figure (related data) The proportion of checking the results of verification by experts and fact-checking organizations

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

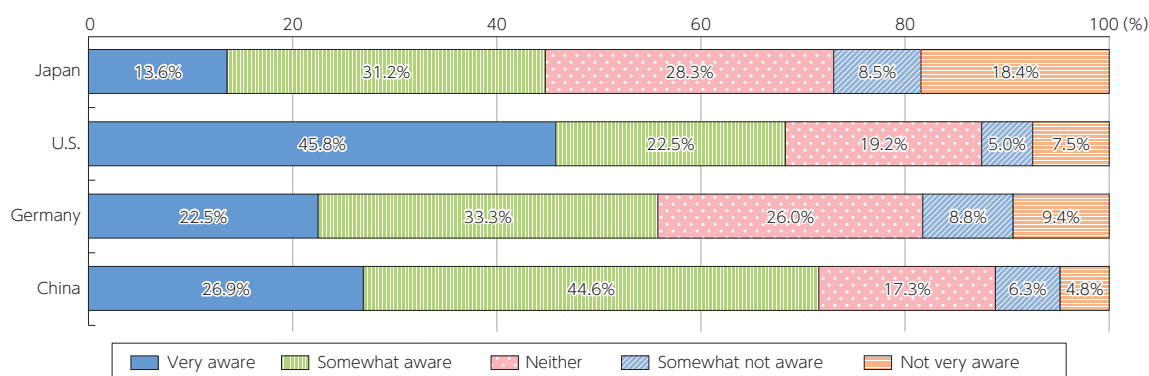
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00322>

(Data collection)

Additionally, when asked about their awareness of the characteristics of online services and apps (such as searching services and social media), including the “Information displayed, such as search results, social media, videos, and music, is optimized (personalized) for the user,” “Recommended accounts or content on social media may be those that the social media provider wants

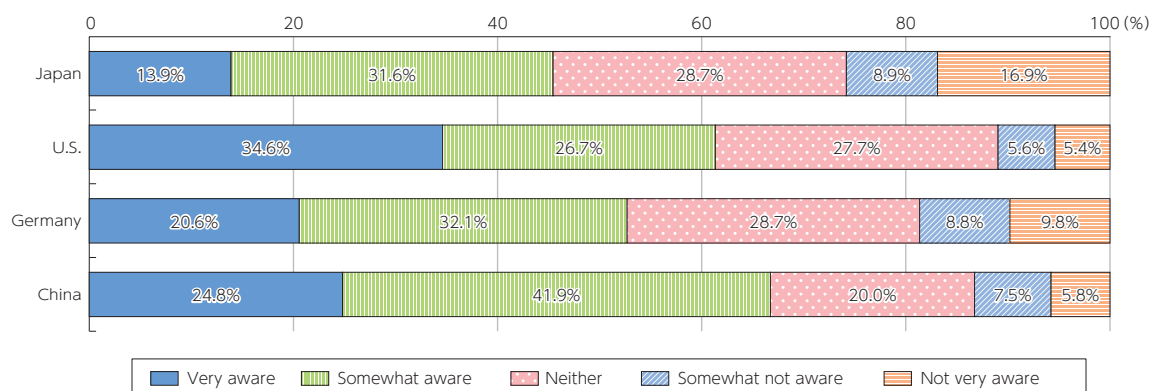
the user to see,” and “Information close to the user’s opinions and thoughts is displayed on social media,” the percentage of respondents in Japan who answered that they were aware (sum of “Very Aware” and “Somewhat Aware”) was below 50% for these items (Figure 2-1-11-15) (Figure 2-1-11-16) (Figure 2-1-11-17).

Figure 2-1-11-15 Awareness that the information displayed in search results and on social media is personalized



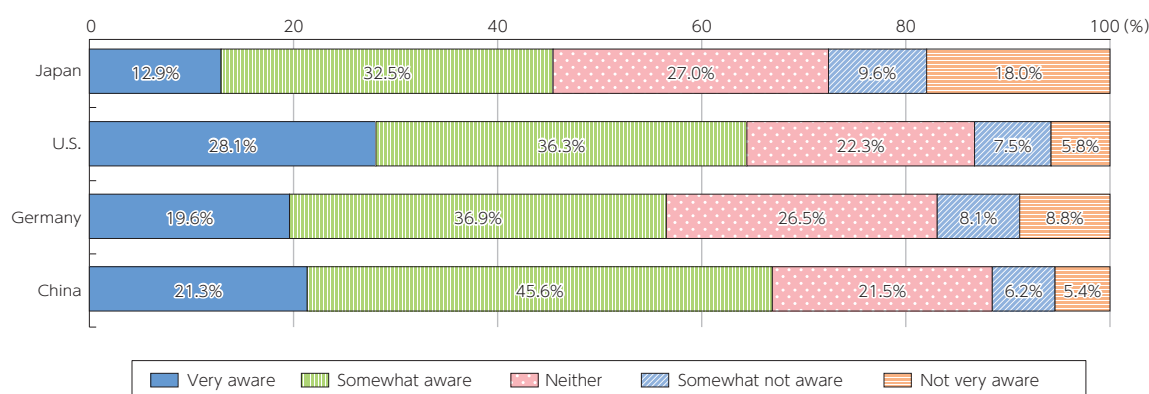
(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

Figure 2-1-11-16 Awareness that service providers may display accounts or content they want users to see



(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

Figure 2-1-11-17 Awareness that opinions and information similar to the user's views tend to be displayed on social media etc.



(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

2. Trends in utilization in corporate activities

(1) The Status of digitalization by companies in each country

A Efforts in digitalization

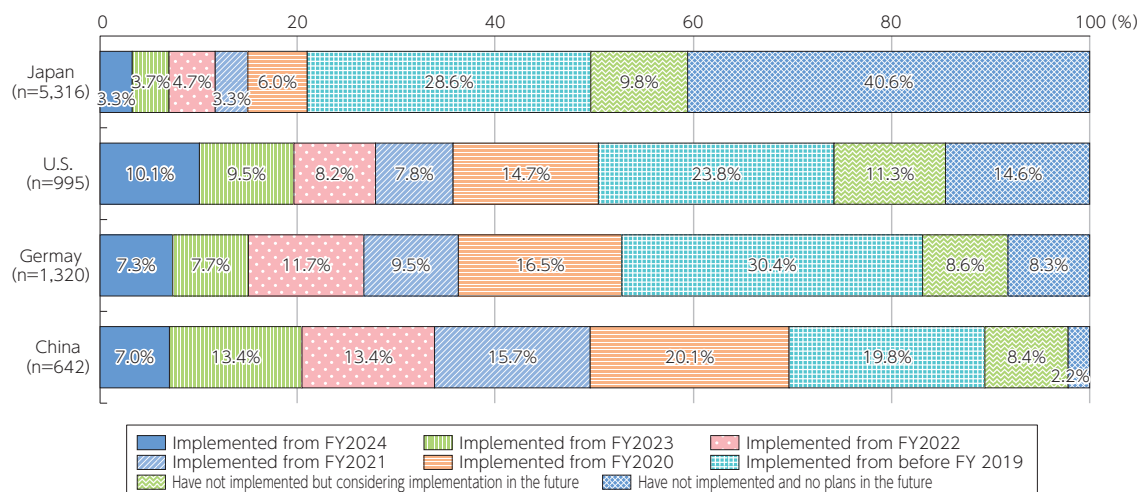
A survey was conducted on the efforts toward digitalization among companies in Japan, the U.S., Germany, and China. After excluding those who responded with "Do not know,"¹¹ it was found that in Japan, the proportion of companies that had not implemented digitalization efforts (combining "Have not implemented but considering implementation in the future" at 9.8% and "Have not implemented and no plans in the future" at 40.6%) was approximately 50%, indicating a delay in promoting digitalization compared with overseas. When looking at the efforts by company size in Japan, it was observed that about 25% of large companies and about 70% of small and medium-sized enterprises responded with "Have not implemented," indicating that there are differences in the status of digitalization efforts depending on the

company size (Figure 2-1-11-18).

In Japanese companies, while there are many comprehensive efforts in digitalizing new ways of working (such as telework) and improving/reforming business processes (such as optimizing business flows with ERP), there are fewer comprehensive digitalization efforts in creating new businesses or creating and improving customer experiences. In Japanese companies, there is a tendency to focus more on defensive digitalization rather than proactive digitalization. In contrast, in the U.S. companies, there is a trend of comprehensive efforts toward new business creation, but partial efforts at the departmental level to create and improve customer experiences (Figure 2-1-11-19).

¹¹ The data were compiled based on the screening data collected until the number of samples for this study was secured.

Figure 2-1-11-18 Status of initiatives to promote digitalization (comparison by country)



* Based on screening research results to extract companies which are taking on digitalization.

(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"



Figure (related data) Status of digitalization (Japan: comparison by company size)

Source: MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00327>

(Data collection)

Figure 2-1-11-19 Detailed initiatives to promote digitalization (comparison by country)



(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

B Effects of digitalization

Regarding the effects of digitalization in terms of “Creating New Business,” “Improving/enhancing Customer Experiences,” “Adding High Value to Existing Products/services,” “Creating/improving Business Processes,” “Streamlining Operations,” and “Realizing New

Ways of Working,” it was found that in Japan, the proportion of responses indicating “Exceeding Expectations” was the lowest across all aspects, and the proportion of responses indicating “Not Achieving the Expected Effects” was the highest among the four countries.



Figure (related data) Effects of digitalization

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

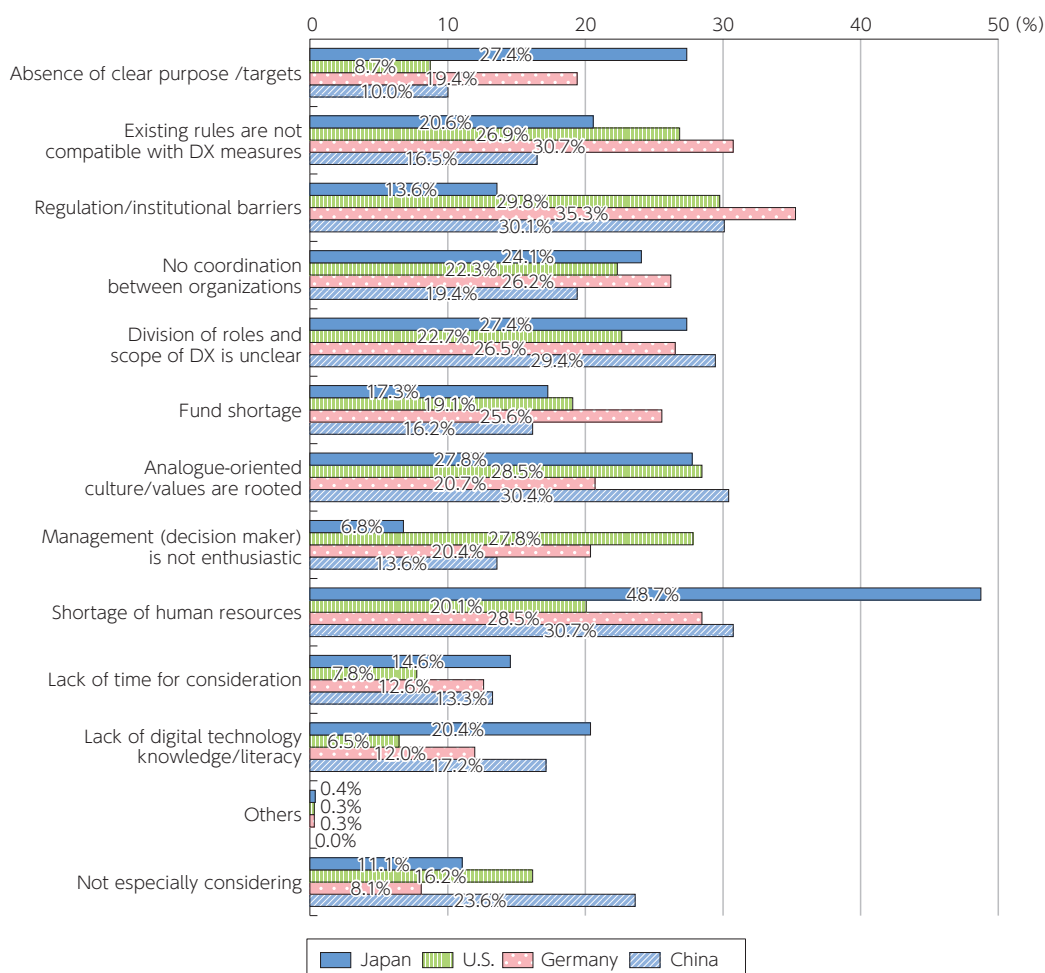
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00329>
(Data collection)

C Challenges in digitalization

In terms of challenges and barriers currently recognized or anticipated in digitalization, Japanese companies had the highest response rate for “Insufficient human resources (48.7%),” which was overwhelmingly higher compared with companies in other countries.

This was followed by “Analogue-oriented culture/values are rooted (27.8%),” “Division of roles and scope of DX is unclear (27.4%),” and “Absence of clear purpose /targets (27.4%)” (Figure 2-1-11-20).

Figure 2-1-11-20 Challenges and barriers currently recognized or anticipated in digitalization (comparison by country)

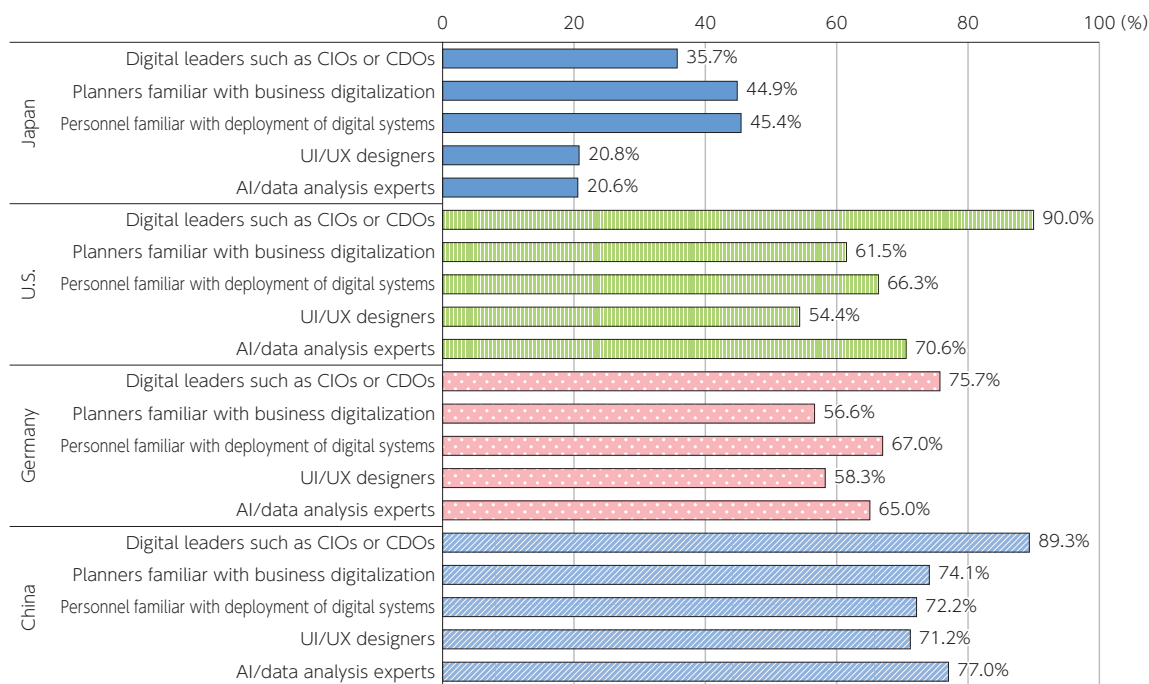


(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

Particularly notable in Japanese companies is the scarcity of UI/UX designers and AI/digital analytics specialists compared with other countries. The proportion of companies indicating the “Presence of UI/UX designers” was 20.8% in Japan, while it was approximate-

ly 55-70% in other countries. Similarly, the proportion of companies indicating the “Presence of AI/digital analytics specialists” was 20.6% in Japan, while it was approximately 65-80% in other countries (Figure 2-1-11-21).

Figure 2-1-11-21 Status of specialized digital human resources



(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"



Figure (related data) Initiatives to secure digital human resources (comparison by country)

Source: MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00332>

(Data collection)

Furthermore, when asked about the status of internal system development, it was found that in Japan, 35.7% of companies responded that they conduct system development under their own leadership ("almost all development is carried out by in-house engineers" and "mainly

developed by in-house engineers, with some development outsourced to external vendors"). In contrast, overseas, approximately 80-90% of companies reported that they conduct system development under their own leadership, showing a significant difference from Japan.



Figure (related data) In-house development of systems (comparison by country)

Source: MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00333>

(Data collection)

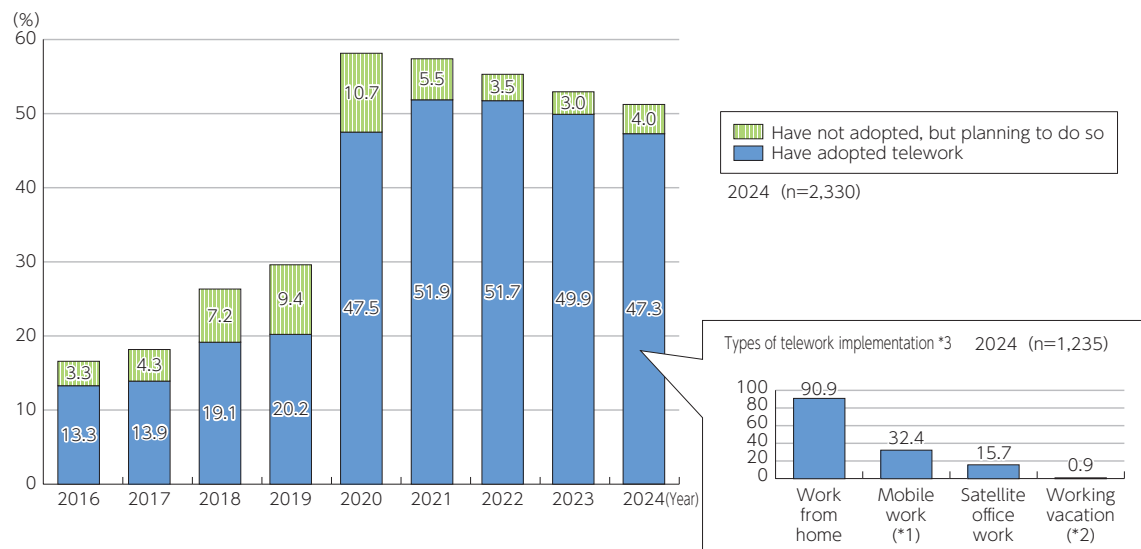
(2) Telework and online meetings

A Adoption of telework in Japanese companies

The adoption of telework in private companies rapidly progressed after the spread of COVID-19 in 2020, however, it has been on a declining trend since 2022.

According to the 2024 Communication Usage Trend Survey conducted by the MIC, about 47.3% of companies have adopted telework (Figure 2-1-11-22).

Figure 2-1-11-22 Changes in the adoption rate of telework



*1 Working outside of the office for sales activities and other similar work, including work such as checking email and writing daily reports during commutes or at locations such as cafes.

*2 Telework performed in a location other than the usual workplace or the home, while also spending time for personal matters.

*3 The total includes entities that provided no response to adoption type.

(Source) MIC "Communications Usage Trend Survey"



Figure (related data) Purpose of adopting telework (multiple answers allowed)

Source: MIC "Communications Usage Trend Survey"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00338>
(Data collection)



Figure (related data) Reasons for not adopting telework (time series)

Source: MIC "Communications Usage Trend Survey"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00339>
(Data collection)

B Utilization of telework and online meetings (individual and international comparison)

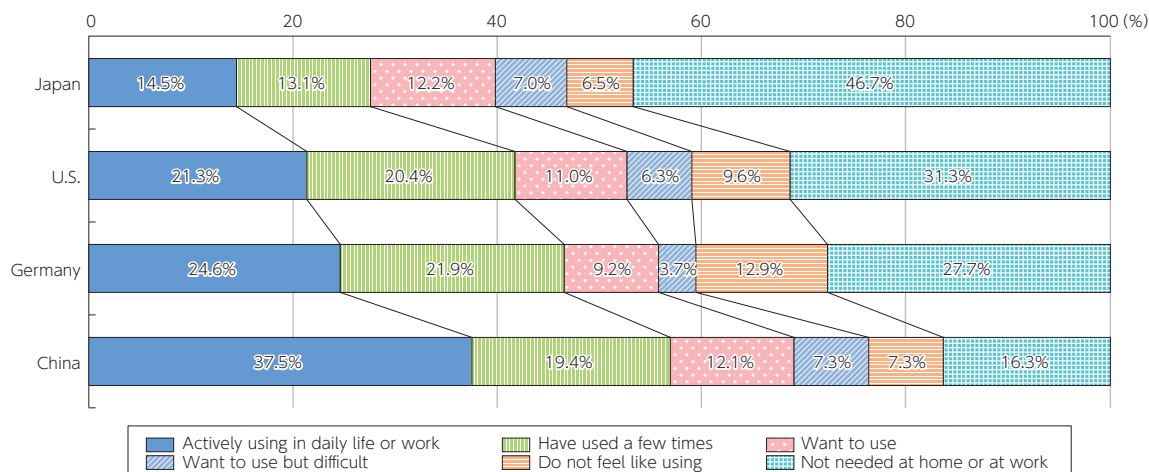
A survey was conducted among citizens of Japan, the U.S., China, and Germany regarding the utilization of telework and online meetings (hereinafter referred to as "telework, etc.>").

The percentage of respondents who answered that they "use telework, etc. actively in their daily life and work" slightly decreased compared with the previous year in the three countries other than Japan, suggesting that this may be due to the social trend of people returning to offices (Figure 2-1-11-23). In Japan, the most common reason cited for the difficulty in implementing telework, etc. was the "lack of services they want to use

in the company" at 36.0%.

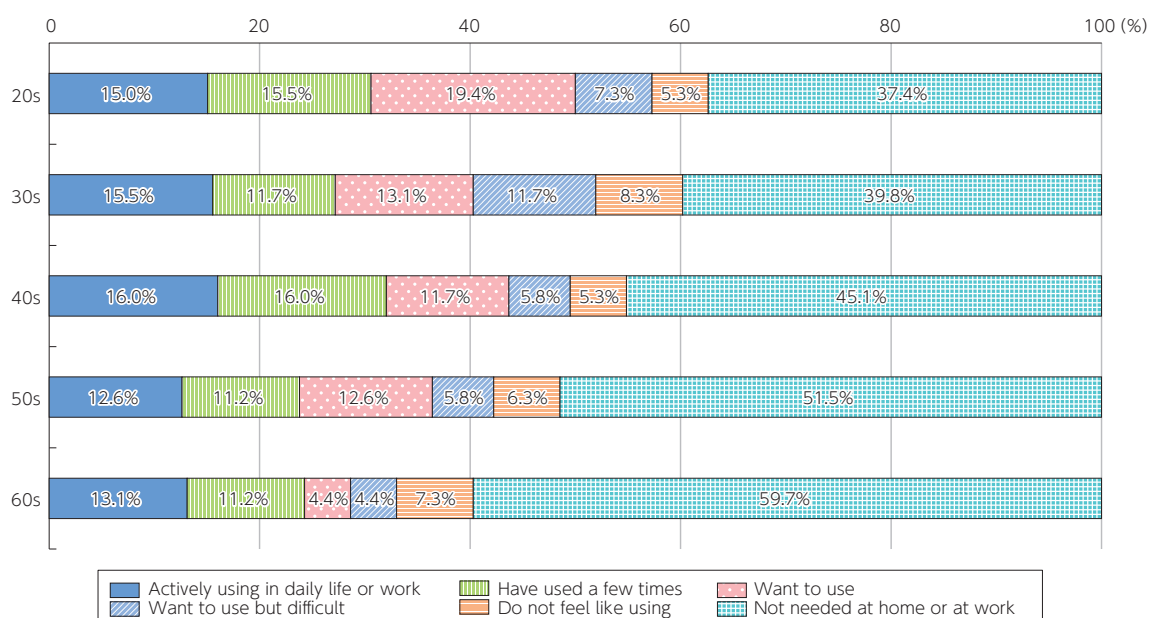
When examining the utilization of telework, etc. in Japan by age group, the highest utilization was among those in their 40s, followed by those in their 20s and 30s, with 32.0% in their 40s. Additionally, a high percentage of respondents in their 20s expressed that they "want to use telework, etc. in the future," indicating their strong willingness to use telework, etc. On the other hand, the percentage of respondents who answered that telework, etc. is "not necessary in their daily life and work" increased with age, with 37.4% in their 20s and 59.7% in their 60s (Figure 2-1-11-24).

Figure 2-1-11-23 Usage of telework and online meetings (international comparison)



(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

Figure 2-1-11-24 Usage of telework and online meetings (Japan, by age)



(Source) MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"



Figure (related data) Reasons why people don't use telework or online meetings

Source: MIC (2025) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00342>

(Data collection)

3. Trends in digital usage in administration

(1) Usage of electronic administrative services (electronic applications, electronic tax filing, electronic notifications)

Regarding the usage of electronic administrative services (electronic applications, electronic tax filing, electronic notifications), about 41% of people in Japan had used these services, which was roughly at the same level as in the previous survey (approximately 41%)¹². It

was also roughly the same as the usage level in the U.S (Figure 2-1-11-25). The main reasons for not using these services included "security concerns," "not knowing how to use the services, devices and applications required for these services," and "lack of desired ser-

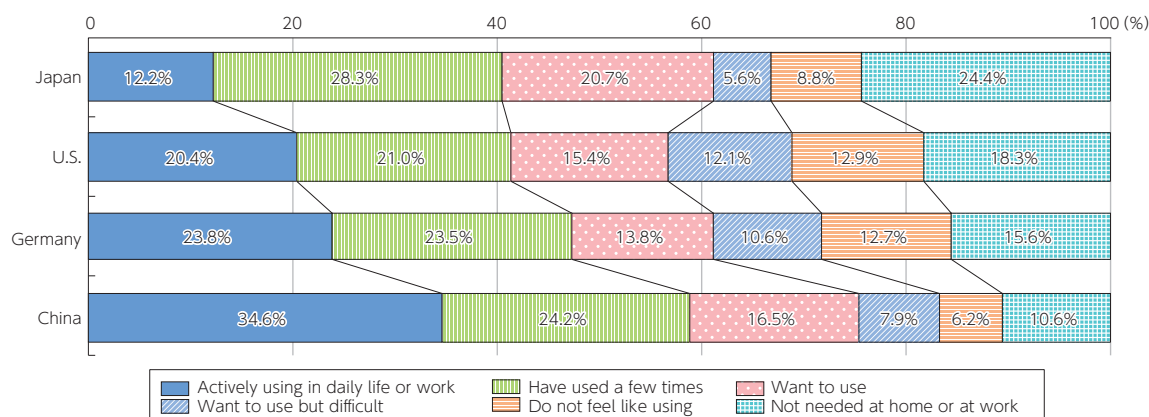
¹² The 2024 White Paper on Information and Communications in Japan. MIC (2024) "Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally"

vices.”

When examining the usage of electronic administrative services in Japan by age group, the percentage of

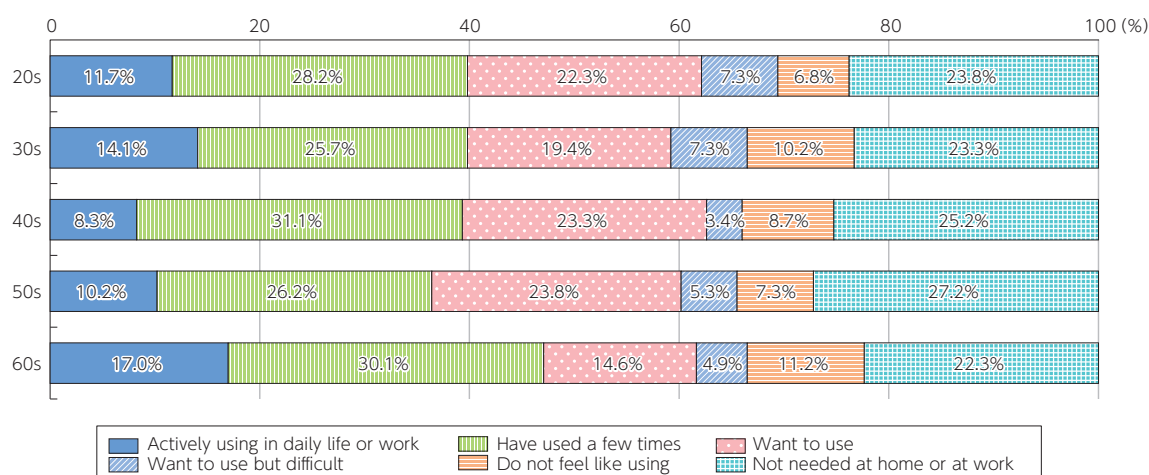
people who have used these services was relatively high among those in their 60s compared with other age groups. (Figure 2-1-11-26).

Figure 2-1-11-25 Usage of digital administrative services (by country)



(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

Figure 2-1-11-26 Usage of digital administrative services (Japan, by age)



(Source) MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”



Figure (related data) Reasons why people do not use public digital services (by country)

Source: MIC (2025) “Research and study on the latest trends in information and communication technology research and development, as well as digital utilization, both domestically and internationally”

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/dashu.html#f00345>

(Data collection)

(2) Promotion of digital government in Japan

A International indicators

Below is an overview of Japan’s position in the world regarding digitalization in the public sector based on in-

ternational indicators.

(A) United Nations Department of Economic and Social Affairs (UNDESA) “World E-Government Ranking”

The UNDESA e-government survey aims to improve transparency and accountability in public policy through ICT and promote citizens’ participation in public policy in the UN member states. It has been conducted since 2003 and biennially since 2008. The survey ranks countries based on the average of three indicators: Online Service Index, Human Capital Index, and Telecommunications Infrastructure Index, to calculate the E-Govern-

ment Development Index (EGDI).

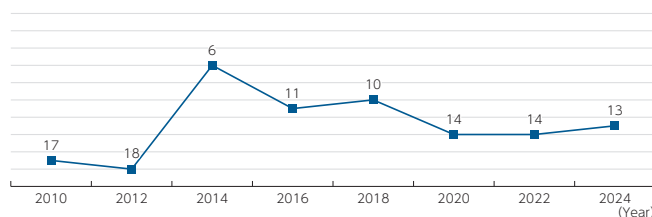
In the 2024 World E-Government Ranking, Denmark continued to rank first as it did in the previous survey (2022), followed by Estonia, Singapore, the Republic of Korea, and Iceland. Japan ranked 13th, up one rank from the previous survey (2022), and its score also increased since the previous survey (Figure 2-1-11-27).

For individual indicators, Japan’s scores improved in

all indicators: Online Service Index (0.9094→0.9427), Human Capital Index (0.8765→0.9117), and Telecom-

munications Infrastructure Index (0.9147→0.9509).

Figure 2-1-11-27 Changes in Japan's ranking in the UN (UNDESA) "World E-Government Ranking"



(Source) UN E-Government Surveys

(B) Waseda University "World Digital Government Ranking"

The Waseda University Institute of e-Government has been publishing the "World Digital Government Ranking" annually since 2005, evaluating the progress of digital government promotion in 66 ICT-advanced countries from multiple perspectives, using 10 main indicators (35 sub-indicators). The top five countries were Singapore, the UK, Denmark, the U.S., and the Republic of Korea. Denmark, which had held the top spot for three consecutive years, fell to third place, while Singapore returned to the top spot for the first time in seven years. In the last

year's survey, Japan fell out of the top 10 for the first time since the survey began, and it remained in 11th place this year. In light of Japan's declining birthrate, aging population, and declining population, the following issues were pointed out as actions that should be taken now: reducing administrative and financial costs and improving efficiency by promoting public-private partnerships and innovation through the use of digital technology, and making proactive and optimal investments in digitalization.



Figure (related data) Changes of the rank of Japan in Waseda University "World Digital Government Ranking"

Source: Institute of Digital Government in Waseda University

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00347>

(Data collection)

B Development of data linkage and authentication infrastructure

(A) My Number Card

As of the end of February 2025, the number of My Number Cards held by the population (calculated by subtracting cards abolished due to death or expiration from the total number issued) reached 78.0%. As of the end of January 2025, approximately 81.53 million cards were registered in total as health insurance cards, with a registration rate of 84.1% relative to the total number of

issued My Number Cards. Regarding the registration of public money receiving accounts, as of the end of January 2025, the cumulative number of registrations was approximately 63.46 million, with a registration rate of 65.5% relative to the total number of issued My Number Cards.



Figure (related data) Changes in the status of adoption of My Number Card

Source: Prepared based on MIC "The Status of Issuance of My Number Card"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00348>

(Data collection)



Figure (related data) Changes in the registration status of My Number Card as health insurance cards

Source: Prepared based on Digital Agency "Dashboard on the adoption of My Number Card" (data obtained on January 31, 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00349>

(Data collection)



Figure (related data) Changes in public fund receipt account registrations of My Number Card

Source: Prepared based on Digital Agency "Dashboard on the adoption of My Number Card" (data obtained on January 31, 2025)

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00350>

(Data collection)

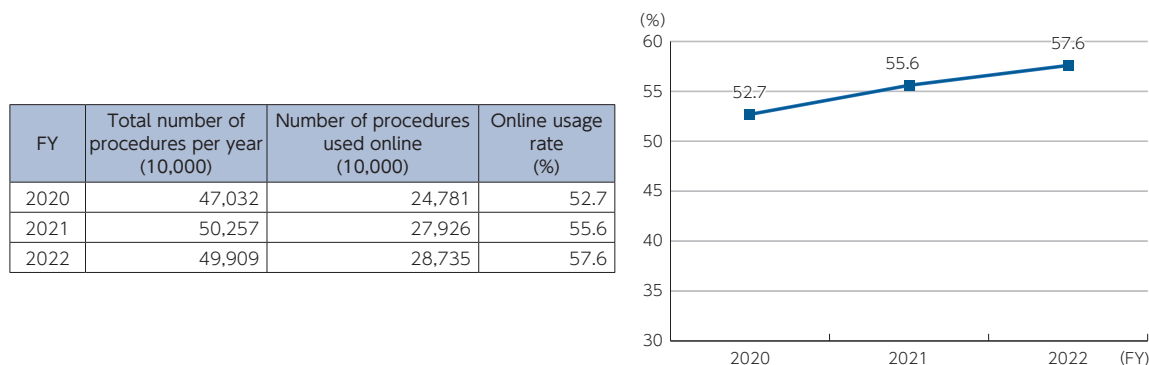
C Digitalization efforts in local governments

(A) Current status of online procedures

Online usage of procedures that local governments should prioritize for online implementation under the

“Priority Plan for Realizing a Digital Society” is as follows (Figure 2-1-11-28).

Figure 2-1-11-28 Changes in the online usage of procedures that local governments should prioritize for digitalization



*1 Online usage for FY2020 was calculated based on a resurvey of the 59 procedures that local governments should prioritize for online implementation as listed in the “Priority Policy Program for Realizing Digital Society” (approved by the Cabinet on June 7, 2022). From FY2021 onwards, the survey continues to conduct the survey on the procedures that local governments should prioritize for online implementation as listed in the “Priority Policy Program for Realizing Digital Society.”

*2 Online usage rate (%) = Number of procedures used online / total number of procedures per year × 100

The total number of procedures per year is a national estimate based on the total number of procedures and the population for organizations that have already gone online for these procedures.

The number of procedures used online is estimated in the same way as the total number of procedures per year, in order to more precisely calculate the online usage rate.

(Source) Prepared based on MIC “Overview of Promotion of DX and Use of Information by Local Governments: Summary of FY2023 Survey on Promotion of Use of Administrative Information by Local Governments”¹³

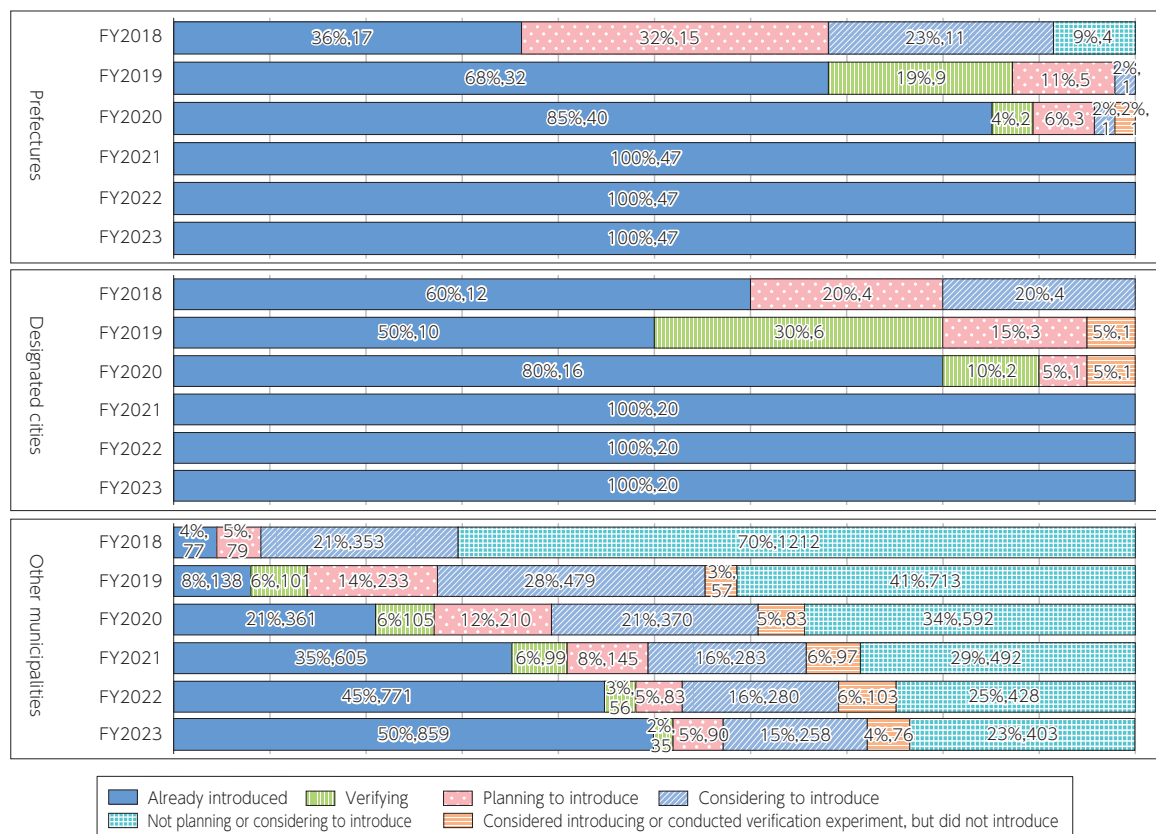
(B) Promotion of AI and RPA utilization

As of FY2021, 100% of prefectures and designated cities had introduced AI. Among other municipalities, 50% had introduced AI as of FY2023, and including those in the process of verification, planning to introduce, or considering to introduce, about 72% of local governments are working towards AI introduction (Figure 2-1-11-

29). By function, the three functions of voice recognition, character recognition, and chatbot responses have been introduced at the highest rates across prefectures, designated cities, and other municipalities. Other functions, although still small in number, have continued to increase.

¹³ https://www.soumu.go.jp/denshijiti/060213_02.html

Figure 2-1-11-29 Status of introduction of AI in local governments

(Source) MIC "Promotion of Utilization of AI and RPA in Local Governments"¹⁴**Figure (related data) Status of introduction of AI in local governments (by AI function)**

Source: MIC "Promotion of Utilization of AI and RPA in Local Governments"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00353>

(Data collection)

Additionally, the number of organizations that had introduced RPA increased to 94% for prefectures and 100% for designated cities as of FY2023. For other municipalities, the introduction rate stood at 41%, but when including those in the process of verification, planning to introduce, or considering to introduce, approximately 65% of

local governments are working towards RPA adoption (Figure 2-1-11-30). By sector, RPA was most commonly introduced in "Finance, Accounting, and Treasury," followed by "Child Welfare and Childcare," "Health and Medical Care," and "Organization and Personnel (including administrative reforms)."

¹⁴ https://www.soumu.go.jp/main_content/000934146.pdf

Figure 2-1-11-30 Status of introduction of RPA in local governments

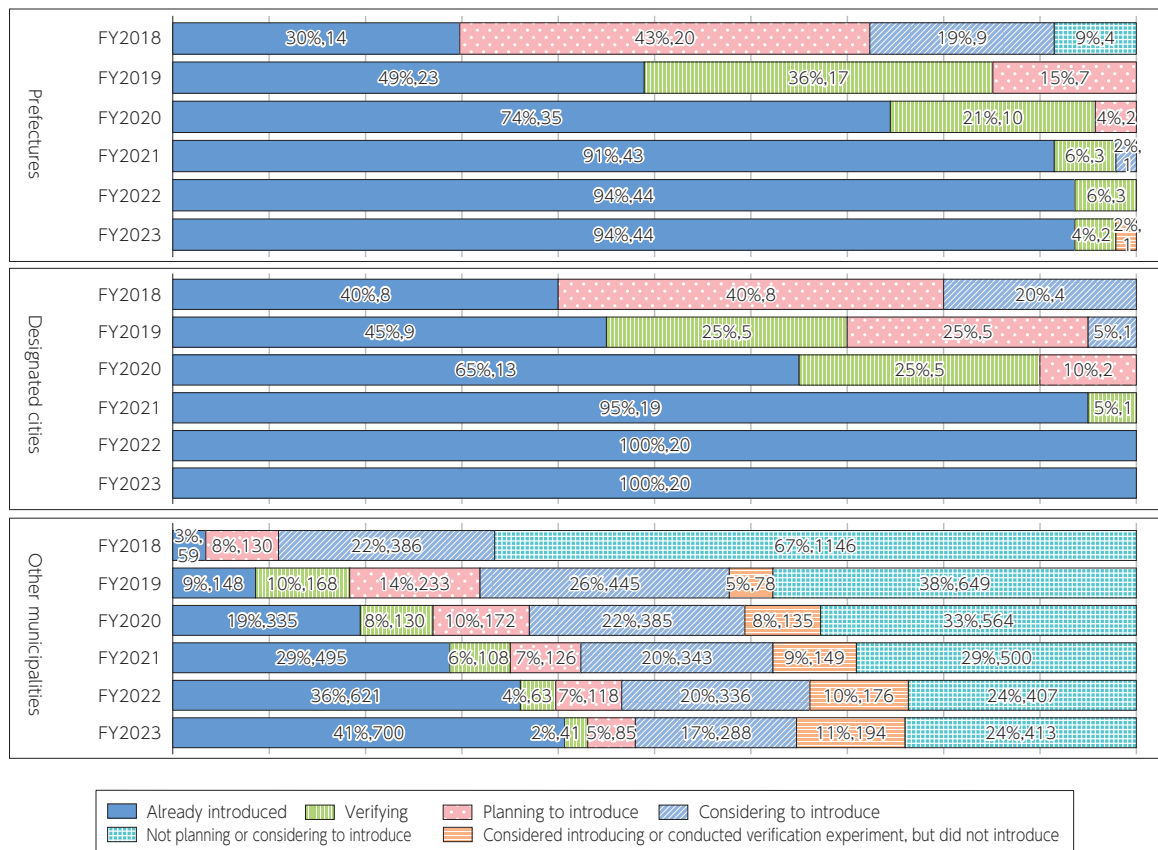
(Source) MIC "Promotion of Utilization of AI and RPA in Local Governments"¹⁵

Figure (related data) Status of introduction of RPA in local governments (by RPA field)

Source: MIC "Promotion of Utilization of AI and RPA in Local Governments"

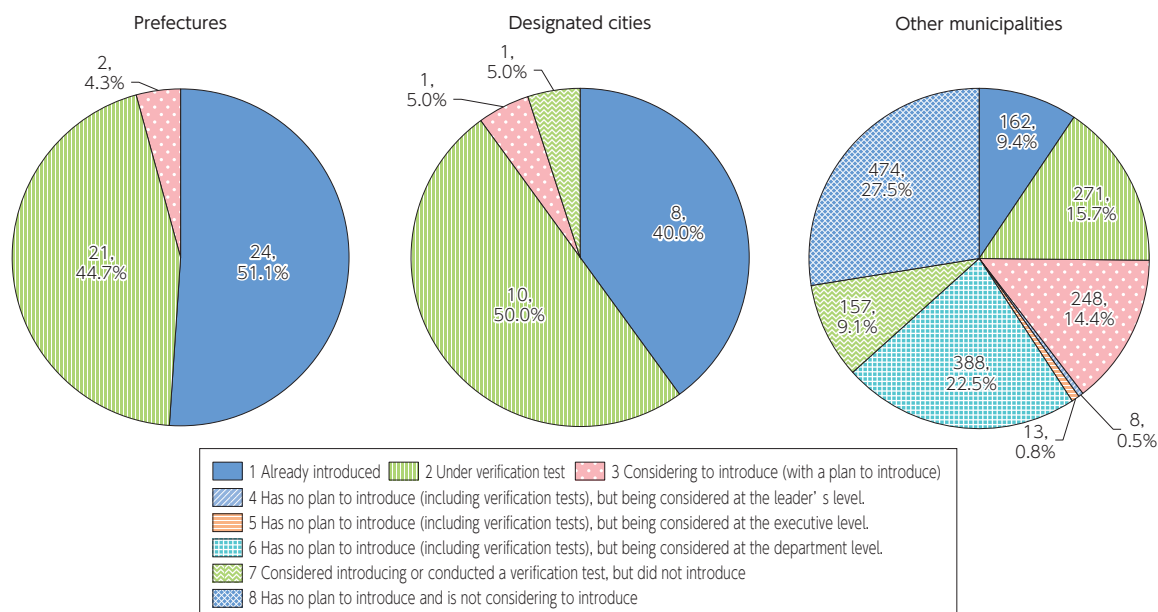
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00355>

(Data collection)

As of the end of 2023, 51.1% of prefectures, 40.0% of designated cities, and 9.4% of other municipalities had

introduced generative AI (Figure 2-1-11-31).

¹⁵ https://www.soumu.go.jp/main_content/000934146.pdf

Figure 2-1-11-31 Status of introduction of generative AI in local governments (as of December 31, 2023)(Source) MIC "Introduction of Generative AI in Local Governments"¹⁶**Figure (related data) Examples of generative AI introduction in local governments (Including Verification Tests) (as of December 31, 2023)**

Source: MIC "Introduction of Generative AI in Local Governments"

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00357>

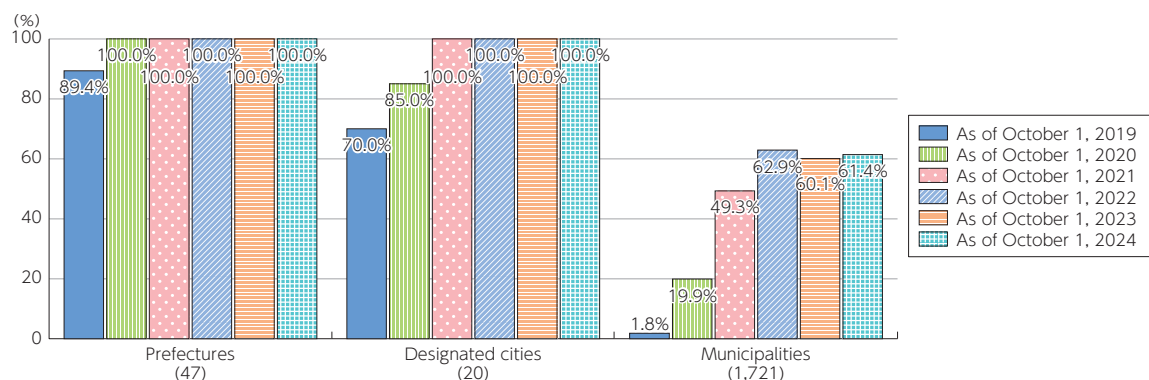
(Data collection)

(C) Status of telework implementation for staff

As of October 2024, all prefectures and designated cities had implemented telework. Among municipalities, the implementation rate was 61.4% as of October 2024, versus 60.1% as of October 2023 (**Figure 2-1-11-32**).

Organizations that had introduced telework identified the following significance and benefits: improvement of the work-life balance of employees; realization of flexible

and diverse working styles; effective use of time; and infection control measures. On the other hand, organizations that had not introduced telework cited the following reasons: many employees are engaged in front-line and field work that is not suited for teleworking; it is costly to introduce telework; and it is difficult to manage employee labor.

Figure 2-1-11-32 Status of telework implementation for staff(Source) Prepared based on MIC "Survey on Telework Initiatives by Local Governments"¹⁷¹⁶ https://www.soumu.go.jp/main_content/000956953.pdf¹⁷ MIC "Survey on Telework Initiatives by Local Governments" (October 1, 2019, October 1, 2020, October 1, 2021, October 1, 2022, October 1, 2023, October 1, 2024) (https://www.soumu.go.jp/main_content/001005074.pdf)

Column Digital Utilization Trends in the 2024 Noto Peninsula Earthquake

1. Survey on ICT usage in the disaster-affected areas of the 2024 Noto Peninsula Earthquake

From November 2024 to March 2025, the MIC conducted a survey of affected people (on an individual basis)¹ and interviews with local governments, etc. (on an organization basis)² (hereinafter referred to as the “Survey of Disaster-Affected Areas”) to clarify how information and communication tools were utilized, as well as related issue, among residents of the disaster-affected areas as well as local governments, businesses, and organizations, etc. involved in the disaster response and reconstruction efforts following the earthquake that

struck the Noto region of Ishikawa Prefecture in January 2024 (hereinafter referred to as the “Noto Peninsula Earthquake”). The results were compared with those of the survey on the Kumamoto Earthquake that occurred in April 2016³ and a nationwide survey on the Noto Peninsula Earthquake conducted in March 2024 (hereinafter referred to as the “Nationwide Survey”)⁴ to analyze the characteristics of ICT usage and related issues in the disaster-affected areas of the Noto Peninsula Earthquake.

2. Use of ICT media immediately after the earthquake

Compared with the methods used to gather information and confirm people’s safety immediately after the main shock of the Kumamoto Earthquake that occurred on April 16, 2016 (during the first few hours after the earthquake), the use of mobile phones, mobile email, and AM radio decreased, while the use of terrestrial broadcasting (television) showed a high percentage of usage (**Figure 1**). One possible reason for the high usage of terrestrial broadcasting during the Noto Peninsula Earthquake is that while the main shock of the Kumamoto Earthquake occurred at around 1:30 a.m., the Noto Peninsula Earthquake struck at around 4:00 p.m.

on New Year’s Day. Therefore, it is possible that a higher percentage of people were watching television just before the earthquake, or were able to turn it on immediately after the earthquake, compared with the Kumamoto Earthquake. Furthermore, there was an overall increase in the use of Internet-based services, such as disaster-prevention apps, Internet-based safety confirmation services, and social media platforms such as X (formerly Twitter). This suggests that, with the widespread use of smartphones and other digital tools, people used a wide range of methods to gather information and confirm people’s safety via the Internet.

¹ Survey Period: November 2024 – February 2025

Method: A web-based survey was conducted for individuals registered as web survey participants, as well as a survey for those who had agreed to participate in interviews.

Respondents: Individuals who resided in the following areas at the time of the Noto Peninsula Earthquake, as well as those who were staying in Area A, which suffered particularly severe damage (a total of 1,092 people).

Area A: Anamizu Town, Uchinada Town, Shika Town, Suzu City, Nanao City, Noto Town, and Wajima City in Ishikawa Prefecture, and Himi City in Toyama Prefecture

Area B: Kanazawa City, Nakanoto Town, and Hakui City

Area C: Kaga City, Kahoku City, Komatsu City, Tsubata Town, Nomi City, and Hodatsushimizu Town

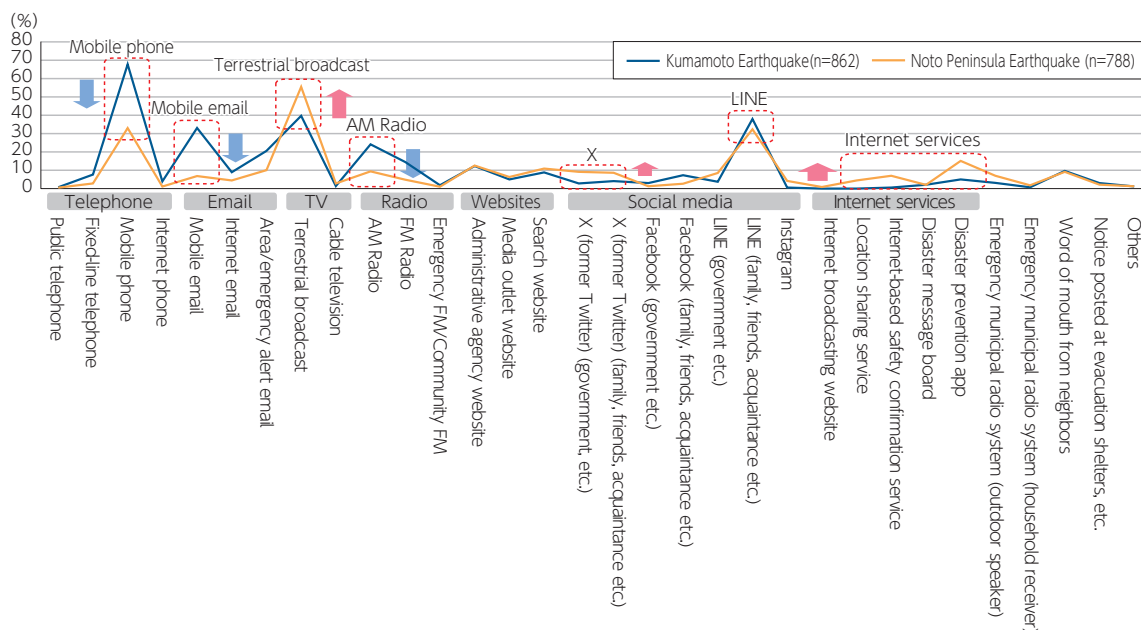
² Survey Period: December 2024 – March 2025

Respondents: Interviews were conducted with 57 organizations, including local governments in Ishikawa Prefecture that suffered particularly severe damage from the Noto Peninsula Earthquake, as well as local governments, businesses, hospitals, agricultural and fishery cooperatives, commerce and industry associations, and non-profit organizations located in Kanazawa City, which accepted a large number of secondary evacuees and served as a hub for external support and disaster response activities.

³ MIC Press Release (April 13, 2017) “Survey Results on the State of Information and Communications in the Kumamoto Earthquake” (https://www.soumu.go.jp/menu_news/s-news/01tsushin02_02000108.html)

⁴ A nationwide web-based survey was conducted for registered participants in March 2024. Responses were evenly distributed by gender (male/female) and age group (20s, 30s, 40s, 50s, and 60s and above), and a total of 2,060 responses were received.

Figure 1: Methods used immediately after the earthquake (multiple answers allowed)



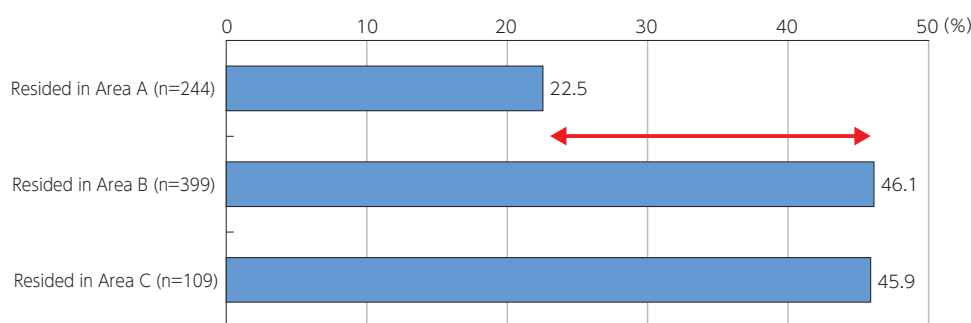
(Source) MIC "Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake"

3. Usage rate of television broadcasting by area of residence

Looking at the percentage of people who first used television broadcasting⁵ immediately after the earthquake by area of their residence, the figure was 22.5% for people who lived in areas that suffered particularly severe damage (Anamizu Town, Uchinada Town, Shika Town, Suzu City, Nanao City, Noto Town, and Wajima City in Ishikawa Prefecture, as well as Himi City in Toyama Prefecture; hereinafter referred to as "Area A"). This was significantly lower than the corresponding percentage (approximately 45%) observed in other surveyed areas (Areas B and C⁶) (Figure 2). Also, when comparing the percentages of respondents who "considered

television broadcasting to be useful before the earthquake" with those who "actually used television broadcasting at the time of the earthquake" by area, the values for the two options were similar in Areas B and C, whereas the percentage of those who "actually used television broadcasting at the time of the earthquake" was lower in Area A (Figure 3). This suggests that in Area A, where damage from the earthquake was particularly severe, many affected residents were unable to access television broadcasting immediately after the earthquake.

Figure 2: Percentage of respondents who first used television broadcasting (by area of residence)



Note: Respondents of these questions are survey respondents who "gathered information and checked the safety of others at the time of the earthquake".

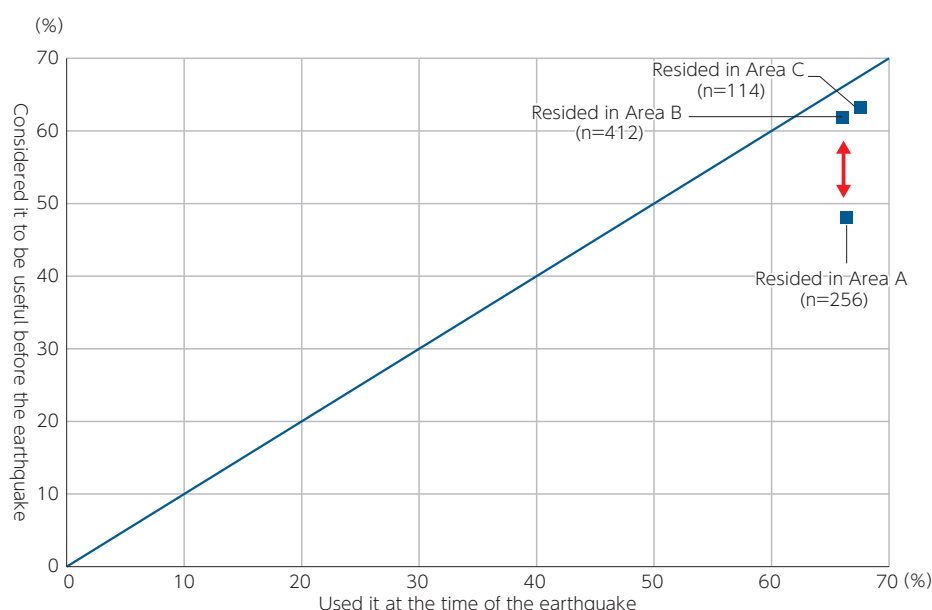
(Source) MIC "Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake"

⁵ In this context, "television broadcasting" includes terrestrial broadcasting, simulcast streaming of TV programs, catch-up/on-demand streaming of TV programs, satellite broadcasting, and cable television broadcasting. Among the 289 respondents who selected "television broadcasting" in Figure 3, the number of those who selected "catch-up/on-demand streaming of TV programs" was zero, and those selected "simulcast streaming of TV programs" was seven. Together they only account for approximately 2% of the total, indicating that the overwhelming majority of respondents obtained information through conventional "television devices."

⁶ Area B: Kanazawa City, Nakanoto Town, and Hakui City

Area C: Kaga City, Kahoku City, Komatsu City, Tsubata Town, Nomi City, and Hodatsushimizu Town

Figure 3: Relationship between the percentage of respondents who considered television broadcasting to be useful before the earthquake and the percentage of those who used it at the time of the earthquake (by area of residence)



(Source) MIC "Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake"

The results of the Survey of Disaster-Affected Areas highlight the importance of television broadcasting as an information-gathering tool during disasters for residents of the affected areas. However, the results also suggest that in areas that suffered particularly severe damage, people were unable to obtain information through television broadcasting, although it had been recognized as a useful tool for gathering information during disasters.

During the Noto Peninsula Earthquake, television broadcasts were interrupted due to power outages and disconnections in transmission lines. In order to deliver comprehensive information to affected residents during disasters in a reliable manner, it is necessary to facilitate the provision of disaster-related information through various communication channels and to further strengthen the resilience of broadcast networks.

4. Impact of unverified information posted on social media

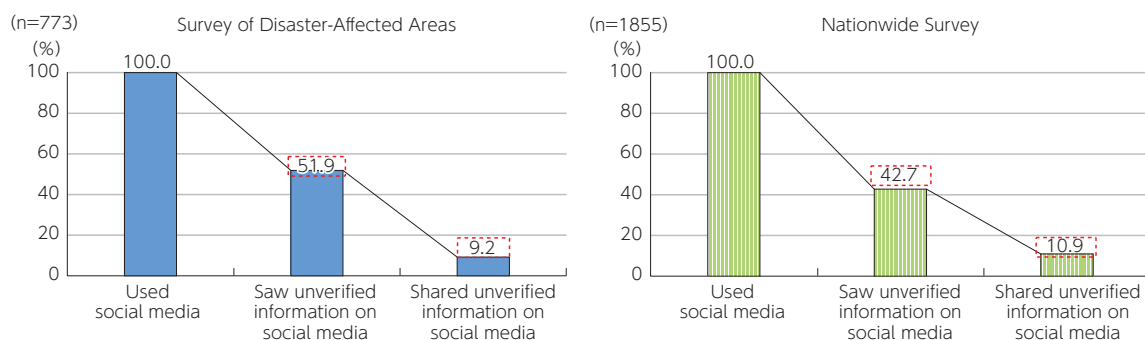
With respect to ICT usage during the Noto Peninsula Earthquake and the Kumamoto Earthquake, a major difference between the two is that the use of smartphones and social media had spread across a wide range of generations at the time of the Noto Peninsula Earthquake. The Nationwide Survey confirmed that unverified information was circulated and spread on social media plat-

forms, and the Survey of Disaster-Affected Areas also confirmed instances where unverified information was circulated and spread on social media, and that such information affected disaster people in disaster-affected areas, including temporary visitors, as well as on local governments and other organizations.

(1) Awareness and spread of unverified information on social media

51.9% of respondents who used social media encountered unverified information related to the Noto Peninsula Earthquake on social media, and 9.2% of respondents said they had shared the information they saw on social media. Compared with the Nationwide Survey, the percentage of respondents who encountered unveri-

fied information on social media was higher in the Survey of Disaster-Affected Areas. This suggests that residents of affected areas were more likely to encounter unverified information related to the earthquake on social media (**Figure 4**).

Figure 4: Awareness and spread of unverified information on social media

Note: Respondents of these questions are survey respondents who “used at least one type of social media”.

(Source) MIC “Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake”

Looking at the percentage of respondents who encountered unverified information by information type and social media platform, X was the highest in both the Survey of Disaster-Affected Areas and the Nationwide Survey, with little difference between the two surveys. However, a notable characteristic of the respondents of the Survey of Disaster-Affected Areas, when compared with those of the Nationwide Survey, was that the overall

percentage of respondents who encountered unverified information on X was relatively lower, while the percentage of those who encountered such information on LINE was higher. In particular, the percentage of respondents who saw posts related to public safety on LINE was significantly higher in the Survey of Disaster-Affected Areas.

(2) Impact of unverified information posted on social media

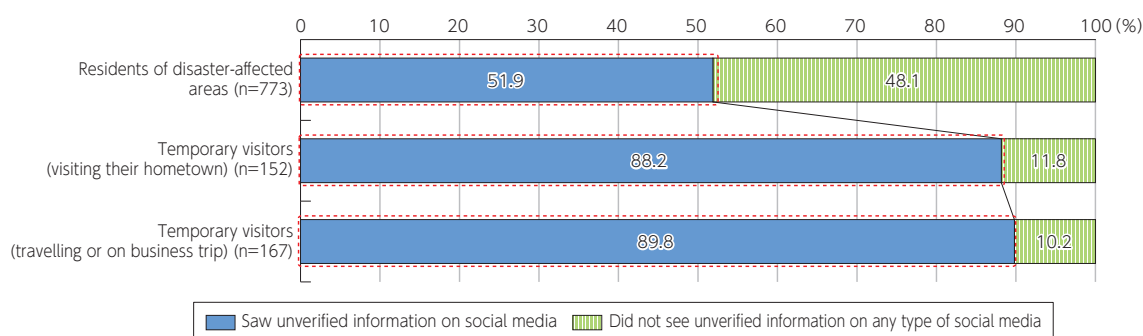
It was also confirmed through the interviews that there were cases where dis-/mis-information was shared and circulated via LINE in the disaster-affected areas of the Noto Peninsula Earthquake, including through LINE’s open chat function within local community groups. This suggests that while LINE was actively used for information sharing in the disaster-affected areas, it also became a route through which unverified information could easily circulate. Furthermore, the interviews

revealed that in areas that suffered particularly severe damage, local governments, etc. received inquiries requesting emergency dispatches based on unverified information on persons in need of rescue that was circulated on social media. However, in many cases, when rescue personnel arrived at the scene, no one was found to be in need of rescue. This shows that unverified information on social media also affected the rescue operations of local governments.

(3) Comparison between residents and temporary visitors in the disaster-affected areas

Given that the earthquake occurred on New Year’s Day, the target of the Survey of Disaster-Affected Areas included not only residents of the disaster-affected areas but also “temporary visitors” in Area A, such as people who were visiting their hometowns for the holidays or travelers in the area. Among social media users, the percentage of those who encountered unverified information was approximately 50% among local residents. On

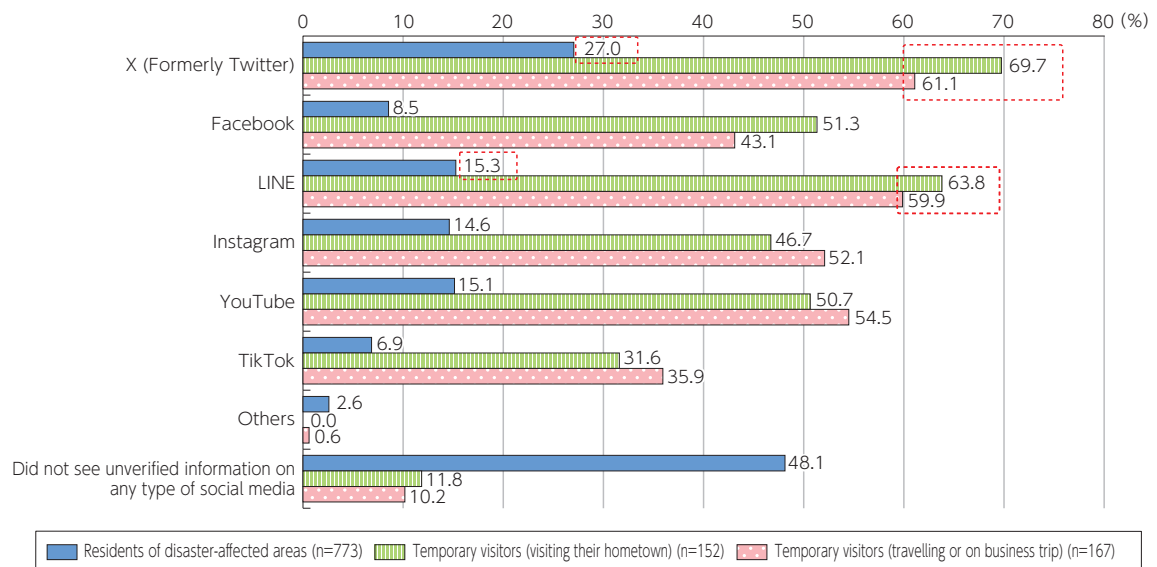
the other hand, the corresponding percentage among temporary visitors was extremely high at around 90% (Figure 5). By social media platform, both groups most frequently encountered unverified information on X, but among temporary visitors, the percentage of people who encountered such information on LINE was as high as on XLINE was used as frequently as X, indicating a different trend from that of local residents (Figure 6).

Figure 5: Awareness of unverified information (single answer; by location of residence/visit)

Note: Respondents of these questions are survey respondents who “used at least one type of social media”.

(Source) MIC “Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake”

Figure 6: Awareness of unverified information (multiple answers allowed; by location of residence/visit and type of social media)



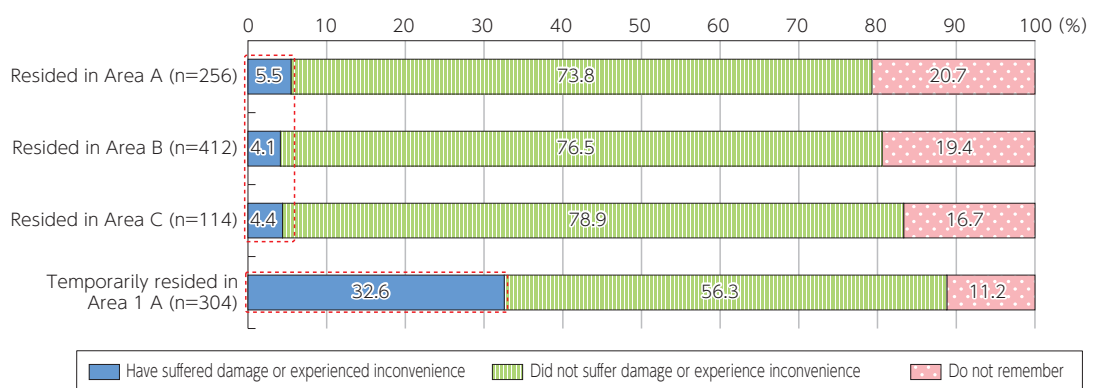
Note: Respondents of these questions are survey respondents who “used at least one type of social media”.

(Source) MIC “Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake”

The percentage of respondents who had actually suffered damage or experienced inconvenience from dis-/mis-information related to the earthquake was 32.6% among temporary visitors, compared with about 5% among local residents (**Figure 7**). Possible reasons for this are: 1) temporary visitors placed greater reliance on

social media as an information source during the disaster, thereby increasing their exposure to dis-/mis-information; and 2) they had difficulty obtaining reliable information because they were unfamiliar with the area, making them more susceptible to unverified information on social media.

Figure 7: Experience of suffering damage or being inconvenienced by dis-/mis-information (single answer; by location of residence/visit)



(Source) MIC “Survey on Digital Utilization Trends in the 2024 Noto Peninsula Earthquake”

The results of this survey confirm that, even in the awareness of affected residents, unverified information was circulated and spread on social media during the Noto Peninsula Earthquake. The results also revealed that the impact of such information was greater on temporary visitors, who tend to have less access to informa-

tion during disasters, and that unverified information also affected the actual rescue operations of local governments, etc. Going forward, addressing dis-/mis-information on social media during disasters remains an important issue.

Section 12 Trends in postal service and correspondence delivery business

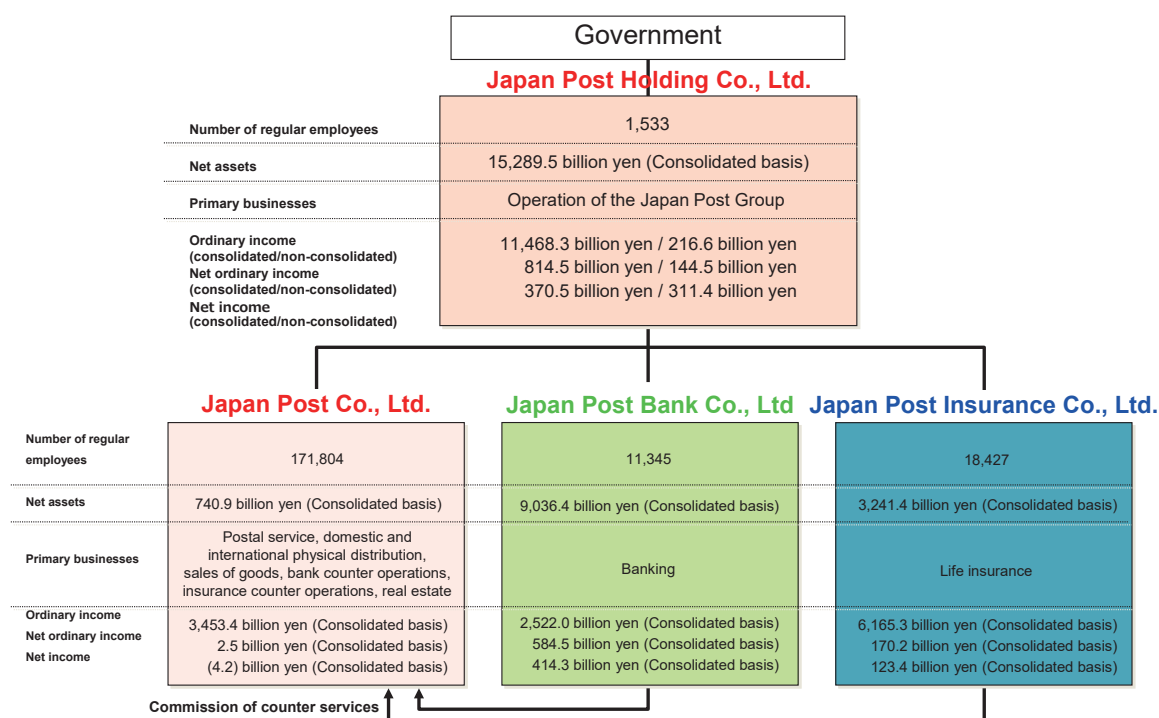
1. Postal service

(1) Japan Post Group

Since October 1, 2012, the Japan Post Group has been operating under a four-company structure with Japan Post Holding as the holding company. (Figure 2-1-12-1). Japan Post Holdings holds 100% of the issued shares

of Japan Post as well as 50.04% of the voting rights of Japan Post Bank and 49.8% of the voting rights of Japan Post Insurance (as of the end of March 2025).

Figure 2-1-12-1 Japan Post Group organization chart



*1 The "net income" of each company is the net income attributable to parent company shareholders.

(Source) Prepared based on financial results for the period ending March 2025 and Japan Post Group Integrated Report 2024 (disclosure report)

Japan Post Group's consolidated financial results for FY2024 show ordinary income of approximately 11 tril-

lion yen and net income of 370.5 billion yen (Figure 2-1-12-2).

Figure 2-1-12-2 Japan Post Group management status

(100 million yen)

Fiscal year	2019	2020	2021	2022	2023	2024
Ordinary income	119,501	117,204	112,647	111,385	119,821	114,683
Net ordinary income	8,644	9,141	9,914	6,576	6,683	8,145
Net income	4,837	4,182	5,016	4,310	2,686	3,705

(Source) Prepared based on Japan Post Holdings "Financial Highlights"

(2) Japan Post Co., Ltd.

A Financial status

For FY2024, Japan Post (consolidated) reported 3,442.3 billion yen in operating income, 3.5 billion yen in net operating income, 2.5 billion yen net ordinary income, and 4.2 billion yen in net loss, indicating an increase in revenue and a decrease in profit.

By business segment, the postal and domestic logis-

tics business recorded 2,080.8 billion yen in operating income, 2,119.2 billion yen in operating expenses, and 38.3 billion yen in net operating loss, an improvement of 30.4 billion yen compared with the previous fiscal year. The post office business recorded 1,008.7 billion yen in operating income, 985.5 billion yen in operating expenses,

es, and 23.1 billion yen in net operating income, a decrease of 25.3 billion yen¹ compared to the previous fis-

cal year (Figure 2-1-12-3).

Figure 2-1-12-3 Changes in net operating income (loss) of Japan Post (consolidated)

(100 million yen)

Fiscal year	2019	2020	2021	2022	2023	2024
Postal and Domestic Logistics Business	1,475	1,237	1,022	328	△ 688	△ 383
Post Office Business	445	377	245	493	729	231
Real Estate Business	—	—	—	—	—	139
International Logistics Business	△ 86	35	287	107	95	133
Japan Post (consolidated)	1,790	1,550	1,482	837	63	35

* Starting from the fiscal year ending March 2025, the business segment classification was changed, and the results of the new “real estate business segment” are disclosed.

(Source) Prepared based on Japan Post Holdings “Financial Highlights”

In addition, the postal business of Japan Post recorded net operating loss of 89.6 billion yen for FY2023.



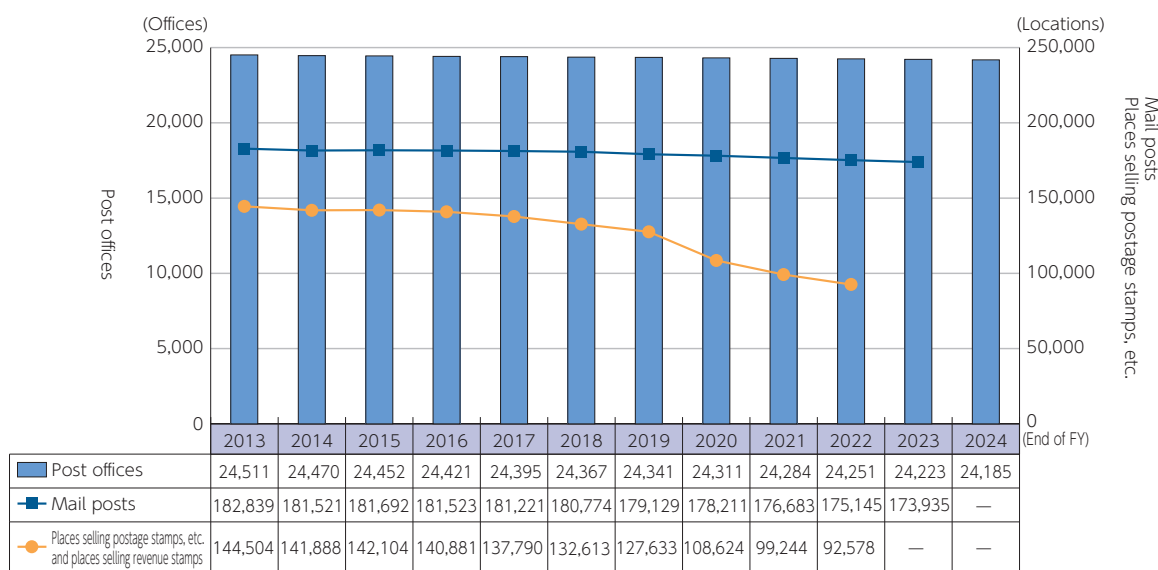
Figure (related data) Income and expenditure of the postal business

Source: Prepared based on Japan Post “Status of Income and Expenditure of the Postal Business”
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00369>
(Data collection)

B Number of postal facilities

As of the end of FY2024, the number of postal offices stood at 24,185, remaining stable (Figure 2-1-12-4).

Figure 2-1-12-4 Changes in the number of facilities related to postal services



(Source) Prepared based on Japan Post Group Integrated Report 2024 (disclosure report) and “Information on the number of postal offices (open data)” on the website of Japan Post

This includes 20,133 directly managed post offices (including branch offices and temporarily closed post

offices) and 4,052 simplified post offices (including temporarily closed simplified post offices).



Figure (related data) Breakdown of the number of post offices (as of the end of FY2024)

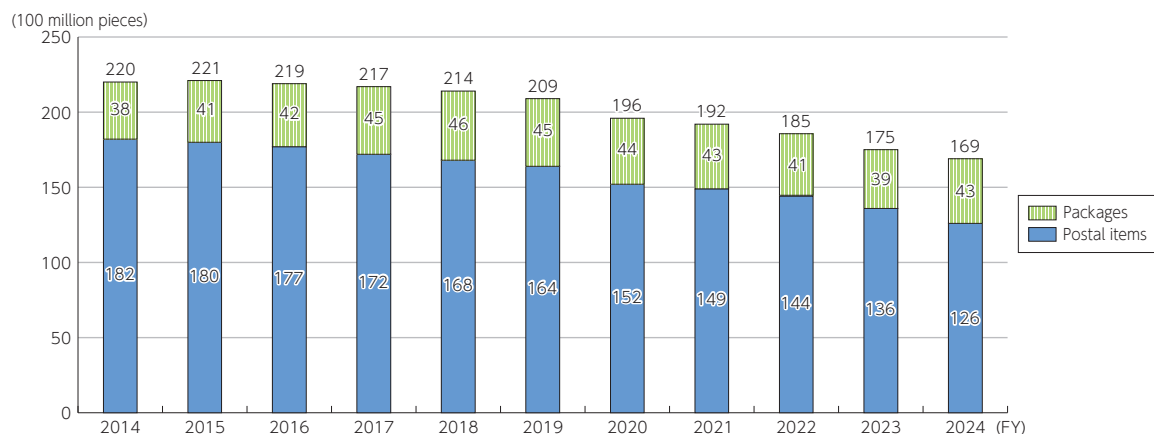
Source: Prepared based on “Information on the number of postal offices (open data)” on the website of Japan Post
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00371>
(Data collection)

¹ The difference from operating profit of the post office business in FY2023 after the reclassification to align with the change in the business segment classification from FY2024

C Volume of accepted postal items

The total volume of accepted postal items for FY2024 was 16.9 billion pieces (**Figure 2-1-12-5**).

Figure 2-1-12-5 Changes in the total number of postal items accepted



* Following the privatization of postal services, Yu-Pack and Yu-Mail are now provided as packages as defined by the Motor Truck Transportation Business Act, etc., and not as parcels as defined by the Postal Act.

(Source) Prepared based on Japan Post "Number of Accepted Postal Items" for each FY

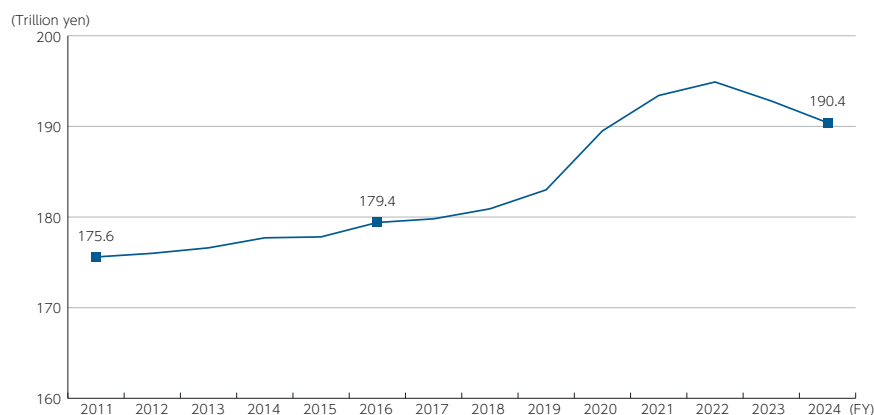
(3) Japan Post Bank Co., Ltd.

Japan Post Bank operates through its directly managed branches (233 branches) and delegates banking agency operations to post offices (approximately 20,000 offices).

The balance of deposits at Japan Post Bank, including

postal savings from the government-owned era, was 190.4 trillion yen at the end of FY2024, a decrease of 69.6 trillion yen (26.8%) from the peak of 260.0 trillion yen at the end of FY1999 (**Figure 2-1-12-6**).

Figure 2-1-12-6 Changes in the balance of deposits of Japan Post Bank



* The figure is the sum of savings before and after postal service privatization.

(Source) Prepared based on Japan Post Bank Annual Securities Report

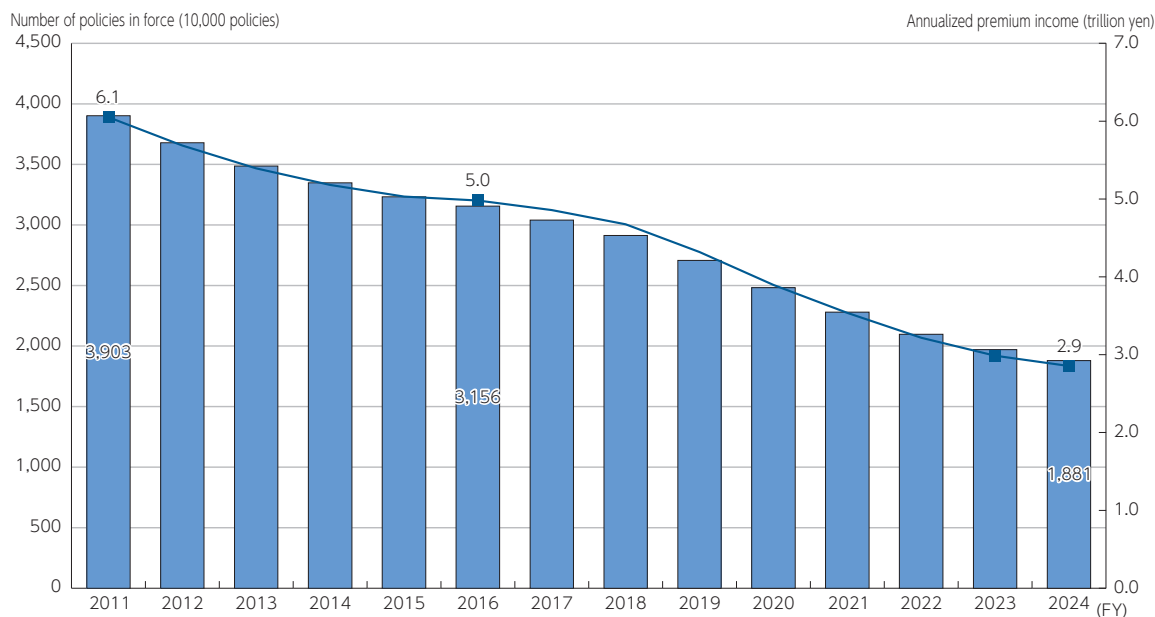
(4) Japan Post Insurance Co., Ltd.

Japan Post Insurance operates through its branches (82 branches) and delegates insurance solicitation operations to post offices (approximately 20,000 offices).

The number of policies in force, including postal life insurance from the government-owned era, was 18.81 million at the end of FY2024, a decrease of 65.51 million

(77.7%) from the peak of 84.32 million at the end of FY1996. The annualized premium income was 2.9 trillion yen at the end of FY2024, a decrease of 4.8 trillion yen (62.3%) compared with the end of FY2008 (7.7 trillion yen) (**Figure 2-1-12-7**).

Figure 2-1-12-7 Changes in the number of policies in force and annualized premium income of Japan Post Insurance



(Source) Prepared based on Japan Post Insurance Securities Report

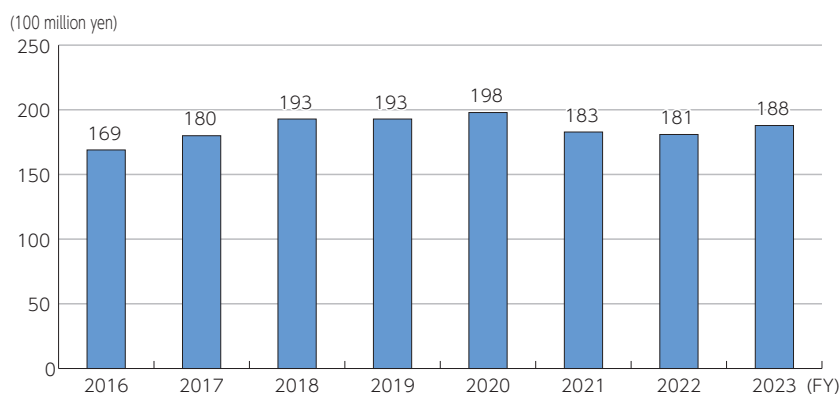
2. Correspondence delivery service

(1) Sales of correspondence delivery business

The sales of the specified correspondence delivery business for FY2023 were 18.8 billion yen, an increase of

3.9% from the previous fiscal year (Figure 2-1-12-8).

Figure 2-1-12-8 Changes in the sales of correspondence delivery service operators



(2) Number of correspondence delivery service providers

Since the enforcement of the Act on Correspondence Delivery by Private Business Operators (Act No. 99 of 2002) in April 2003, there have been no new entrants into the general correspondence delivery business², but as of the end of FY2024, 623 providers have entered the

specified correspondence delivery business³. In addition, by type of services provided, the number of entrants into the class 1 and class 3 services has been increasing.



Figure (related data) Changes in the number of specified correspondence delivery service operators

URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#00376>

(Data collection)

² "Nationwide full-scale entry" business that can deliver all types of correspondences on condition of providing general correspondence delivery service across the country.

³ "Specific service type" business with ingenuity. The organization must perform one of three types of specified correspondence delivery service (Class 1 to 3).



Figure (related data) Changes in the number of business operators by type of service provided
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00377>
(Data collection)

(3) Correspondence delivery handling performance

The number of accepted correspondence delivery items for FY2023 was 21.16 million pieces, an increase of 5.8% from the previous fiscal year.



Figure (related data) Changes in the number of correspondences accepted
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00378>
(Data collection)

Chapter 2

ICT Policy Initiatives at the Ministry of Internal Affairs and Communications

Section 1 Pursuing a Comprehensive ICT Policy

1. Current status and issues

(1) Low birthrate, aging population, stagnant Japanese economy

The number of births in Japan has continued to decline since 2016, and the problems of Japan's falling birthrate and aging population are becoming increasingly serious. In particular, labor shortages are growing worse with each passing year due to the dwindling working-age population (population aged 15-64), and there are concerns that this will lead to diminishing economic growth rates due especially to the exhaustion and decline of rural areas and future economic and market shrinkage. The Japanese economy has also been in a

prolonged period of stagnation and labor productivity has declined. Digital technology plays a major role in solving these issues. For example, further progress in digital technology, including AI and robotics, and in its penetration and utilization throughout society is expected to help resolve labor shortages and revitalize the economy by improving productivity and competitiveness. In addition, it is expected that the use of telework and satellite offices will expand employment options regardless of locations.

(2) Intensifying disasters and aging social infrastructure

In recent years, Japan has experienced frequent severe weather disasters due to the effects of climate change and other factors, and large-scale earthquakes such as the Nankai Trough Earthquake and the Tokyo Metropolitan Earthquake are said to be imminent. In the event of such a disaster, ICT must be utilized to accurately collect disaster-related information and provide evacuation information, etc., as well as to quickly restore communications and sustain continuous communications services.

There is concern that the infrastructure developed intensively during Japan's period of rapid economic growth will deteriorate rapidly, and this makes strategically maintaining and updating infrastructure an urgent issue. At the same time, it is becoming increasingly difficult to allocate sufficient labor and resources to maintain infrastructure with a declining supply of labor attributable to a falling birthrate and an aging population, and it is therefore important to make thorough use of digital and new technologies in pursuing initiatives.

(3) Increasingly complex international circumstances

The international situation surrounding Japan is becoming increasingly uncertain and opaque, with geopolitical tensions rising as a result of such factors as Russia's invasion of Ukraine, growing uncertainty in the global economy, cross-border cyber attacks on critical infrastructure, and the proliferation of disinformation. Under these circumstances, the Act on the Promotion of Ensuring National Security Through Integrated Implementation of Economic Measures" (Act No. 43 of 2022) enacted in May 2022 lists "telecommunications business," "broadcasting business," and "postal business" as business fields that could be covered by a system de-

signed to ensure the stable provision of specified essential infrastructure services. The government will be making steady efforts to ensure the effective operation of such a system in future. The era of AI and DX requiring large-capacity, high-speed communication networks that support enormous traffic as well as computational resources that can handle massive data processing has made it necessary to pursue initiatives to improve Japan's international competitiveness in the digital sector to address the crucial issue of ensuring Japan's autonomy in the digital sector from the perspective of economic security.

2. Efforts in pursuit of a comprehensive ICT policy

Japan's IT strategy began with the "e-Japan Strategy" formulated in January 2001 that mainly promoted infrastructure development and IT utilization, which underwent repeated reviews. Following the establishment of the Digital Agency in September 2021, a Digital Society Promotion Council chaired by the Prime Minister was established in accordance with the Act on the Establish-

ment of the Digital Agency to promote the implementation of measures needed to form digital societies as well as to coordinate among relevant administrative agencies as necessary on said measures needed to form a digital society. The Council discussed the "Priority Plan for the Advancement of a Digital Society", which specifies measures that the government should implement promptly

and intensively to realize the digital society to which it aspires, and serves as a compass for government ministries and agencies to undertake structural reforms and individual measures, and to communicate and recommend these to the rest of the world; revisions to this were approved by the Cabinet in June 2025. The Plan outlines six goals for the digital society – (1) growth strategies through digitalization, (2) digitalization of quasi-public sectors such as healthcare, education, disaster prevention, and childcare, (3) regional revitalization through digitalization, (4) a digital society in which no one is left behind, (5) development and securing of digital human resources, and (6) international strategies including promotion of DFFT (Data Free Flow with Trust) – and compiles policies to realize these strategies. In line with this plan, the MIC is currently pursuing measures relevant to it.

For citizens and businesses to reap the benefits of digitalization, it is necessary to improve local livelihoods, revitalize industry, realize sustainable societies, and increase happiness by resolving local issues through practical applications of digital technology. Accordingly, Vision of Digital Garden City Nation Realization Conference, chaired by the Prime Minister, was established in November 2021 to give concrete shape to the Vision and advance regional revitalization through practical applications of digital technology by promoting digitalization in rural areas, generating new waves of change, and narrowing the gap between rural and urban areas in order to achieve the world-connecting “Vision for a Digital Garden City Nation”. Based on the Council’s deliberations, the Cabinet in June 2022 approved the “Basic Policy for the Vision for a Digital Garden City Nation” and in December of the same year the “Comprehensive Strategy for the Vision of a Digital Garden City Nation”, which identifies the Vision’s basic medium- to long-term direction for the five-year period FY2023-FY2027. Furthermore, the Cabinet approved the “Comprehensive Strategy for the Vision for a Digital Garden City Nation (2023 Revised Version)” in December 2023 in keeping with digital administrative and fiscal reforms, and compiled the “Report on Digital Administrative and Fiscal Reform 2024” (approved in May 2024 by the Meeting on

Digital Administrative and Fiscal Reform) in June 2024.

Based on the idea that local communities are the main drivers of growth, the Headquarters for Creating New Regional Economies and Living Environments, headed by the Prime Minister, was established in October 2024 to transition from the Vision of Digital Garden City Nation Realization Conference in order to take large-scale regional development measures as catalysts for economic growth in Japan and thereby enable communities to achieve development in line with their own characteristics. Based on the discussions held by the Headquarters, the “Basic Concept” for Regional Revitalization 2.0 was finalized in December of the same year and, in June 2025, the Cabinet approved the “Basic Concept” for Regional Revitalization 2.0, which will be intensively implemented over the next ten years.

Given that the thorough utilization of digital and new technologies is one of the pillars of this “Basic Concept”, MIC – via the Information and Communications Policy Subcommittee under the Information and Communications Council – has been deliberating since February 2025 on the best approaches to information and communications policy for promoting the digital transformation (DX) of local communities in light of their socioeconomic circumstances and the latest trends in AI and other digital technologies; a report is expected in the summer of that same year.

The key factor in leveraging AI and advancing DX in rural areas to achieve Regional Revitalization 2.0 will be the development of new digital infrastructure centered on “all-optical networks” that utilize the expected game-changer of photonics-electronics convergence technology. A growing digital dependence on foreign countries in recent years requires from a security perspective as well that the technologies and systems that form the core of this digital infrastructure be made more competitive and be extended overseas.

To this end, MIC published its “DX and Innovation Acceleration Plan 2030” in May 2025 ¹(**Figure 2-2-1-1**). Going forward, MIC will make committed efforts to accelerate DX and innovation in line with the “Digital Infrastructure Development Plan 2030” and the “Comprehensive Strategy for Digital Overseas Promotion 2030”.

¹ Publication of “DX and Innovation Acceleration Plan 2030” (May 23, 2025)
https://www.soumu.go.jp/menu_news/s-news/01tsushin01_02000340.html

Figure 2-2-1-1 DX and Innovation Acceleration Plan 2030

DX and Innovation Acceleration Plan 2030

- Utilizing AI and otherwise accelerating social DX is essential for generating innovation and achieving economic growth in a society with a declining population.
- In particular, realizing a new digital infrastructure centered on an all-photonics network utilizing the likely game-changing optoelectronic convergence technology is key to pursuing DX in local communities to bring about "Regional Revitalization 2.0".
- Japan's increasing dependence on other countries in the digital field in recent years makes it necessary from a security perspective to make the technologies and systems that form the core of its digital infrastructure more competitive and to promote their deployment overseas.
- To this end, robust efforts will be made to accelerate DX and innovation in accordance with the "Digital Infrastructure Development Plan 2030" and the "Comprehensive Strategy for Digital Overseas Promotion 2030"

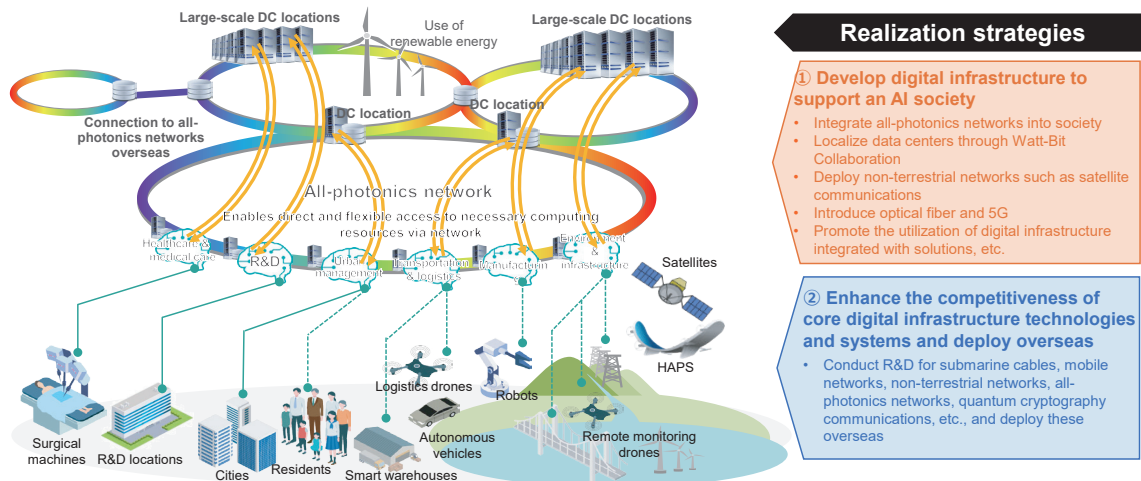


Figure (related data): Vision of Digital Garden City Nation Realization Conference
 URL: https://www.cas.go.jp/jp/seisaku/digital_denen/index.html



Figure (related data): Headquarters for Creating New Regional Economies and Living Environments
 URL: https://www.cas.go.jp/jp/seisaku/atarashii_chihausousei/index.html

Section 2 Trends in Telecommunications Business Policy

1. Summary

(1) Past initiatives

Many new carriers have entered the market over the past 40 years since the liberalization of telecommunications in 1985 and the enactment of the Telecommunications Business Act (Act No. 86 of 1984), and various communication technologies such as IP, digitalization, and mobile broadband have been developed and introduced under the principle of competition, resulting in lower rates and more diversified and sophisticated services. To date, MIC has conducted constant reviews of various policies and systems from the perspective of ensuring the provision of reliable telecommunications services while maintaining the innovation and dynamism of such telecommunications services.

For example, Japan's telecommunications market has been undergoing major environmental changes in recent years such as widespread adoption of mobile phones and broadband as well as the expansion of group-based competition primarily among mobile carriers.

(2) Future Issues and Directions

The telecommunications business provides telecommunications services that are indispensable to people's lives and socioeconomic activities. As Japan's social structure moves toward rapid population decline and super-aging, ICT is expected to play an increasing role in regional revitalization by strengthening local industrial bases and promoting migration to rural areas, as well as in stimulating economic activities such as creating new businesses and improving productivity, achieving safe and secure communities, and resolving social issues in such fields as medicine, education, and public administration.

In this context, developing digital infrastructure is extremely important as a foundation to support the promotion of innovation, digitalization and digital transformation across Japanese society as a whole, and to protect the interests of telecommunications service users, for each and every individual and for Japan's social and economic well-being.

Institutional improvements that continue to ensure a fair competitive environment in view of these environmental changes are needed. With regard to mobile phones that have now become essential everyday necessities, there were issues such as relatively high costs vis-à-vis other countries and the complex and difficult-to-understand fee plans of various carriers. Efforts have been carried out to put in place a fair competitive environment so as to resolve these issues and enable people to enjoy a diversity of low-cost mobile phone services.

The government has also made institutional improvements to address the increasing number of various troubles surrounding the use of telecommunications services due to the information gap between users and operators, inappropriate solicitation by operators, and other factors, as well as the growing seriousness of global risks such as increasingly complex and sophisticated cyber-attacks.

Not only Japan's telecommunications market but indeed its social structure itself is expected to undergo further radical changes in the future, and the social and economic models we have taken for granted until now will no longer apply. Therefore, there is an increasing need to use advanced information and communication technologies to resolve social issues and create value.

Telecommunication services have become indispensable for people's lives and socioeconomic activities, and it is thus essential that these services be continually available even during emergencies such as natural disasters and communication failures.

Accordingly, an environment must be developed in a way that enables any and all actors in Japan to utilize information and communications services in a safe, secure, and reliable manner.

holding company), NTT EAST and NTT WEST regarding research and development, was promulgated and enforced in April of that same year. A final report covering universal service, fair competition, economic security and other such matters that the first report recommended be further examined in the future was compiled in February 2025 based mainly on expert discussions conducted by three Committee working groups as well as interviews with related businesses. The final report makes a wide range of recommendations regarding telephone and broadband services, among them being to add services utilizing mobile networks (Fixed-Mobile

2. Approaches to Telecommunications Policy in Response to Changes in the Market Environment

In August 2023, the MIC consulted the Information and Communications Council on "Approaches to Telecommunications Policy in Response to Changes in the Market Environment" in order to respond quickly and flexibly to changes in the market environment, improve people's lives, and stimulate the economy. Based on the first report compiled in February 2024 following discussions at the Special Subcommittee on Telecommunications Policy established under the Council, the Act Partially Amending of the Act on Nippon Telegraph and Telephone Corporation, etc. (Act No. 20 of 2024), which abolished the obligations of NTT, Inc. (the NTT Group's

holding company), NTT EAST and NTT WEST regarding research and development, was promulgated and enforced in April of that same year. A final report covering universal service, fair competition, economic security and other such matters that the first report recommended be further examined in the future was compiled in February 2025 based mainly on expert discussions conducted by three Committee working groups as well as interviews with related businesses. The final report makes a wide range of recommendations regarding telephone and broadband services, among them being to add services utilizing mobile networks (Fixed-Mobile

Convergence [FMC] services, etc.) to universal service and the transfer, etc. of NTT East and West's poles, ducts, and other facilities will need official approval. Based on these recommendations, the MIC submitted to the Diet in March of that year a bill entitled "The Act Partially Amending the Telecommunications Business Act and the Act on Nippon Telegraph and Telephone Corporation", that concerned universal telecommunica-

tions services, in addition to prescribing last resort telecommunications carrier that is responsible for providing service in areas where other telecommunications carriers do not provide service, measures for reviewing NTT East and West's scope of business, etc., and this bill was passed into law in May of the same year. Specific institutional improvements are to be set forth in ministerial ordinances, etc., in the future.

3. Establishment of a fair competitive environment

(1) Analysis and verification of telecommunications markets

A Verification of telecommunications markets

Since FY 2016, the MIC has been implementing market review initiatives to analyze and verify market trends and confirm the appropriateness of telecommunications carriers' operations in an integrated manner, and the MIC holds Telecommunications Market Review Meetings attended by academic experts and others to obtain advice from objective and expert perspectives. With advancing digitalization making people's livelihoods and socioeconomic activities increasingly dependent on telecommunications, the MIC has also been monitoring major telecommunications carriers through interviews

and other means from the FY2023 verification onward in light of rapid changes in the market environment and the diversification of services and in light of the risks faced by carriers in providing telecommunications services in both emergency and non-emergency circumstances. Market verification has been carried out continuously since FY2023 in accordance with the "Basic Policy on Market Verification in the Telecommunications Business Sector" formulated in August 2023, which includes such monitoring.

B Establishment of a fair competitive environment, etc., in the mobile market

The MIC is undertaking efforts to establish a fair competitive environment in the mobile market in order to realize a diversity of low-cost services through active competition among carriers. In 2019, the Telecommunications Business Act was amended to separate telecommunications charges from handset charges and prohibit excessive locks on customers, etc., and the effects of the measures taken as a result of these amendments and their impact on the mobile market have been subject to continuing verification since 2020 by the Working Group on the Verification of Competition Rules (hereinafter, the "Competition WG") under the auspices of the Telecommunications Market Verification Council.

As part of its efforts to date, MIC in October 2020 released an "Action Plan for the Establishment of a Fair Competition Environment in the Mobile Market", which outlines specific measures to improve the fair competition environment in the mobile market. Based on deliberations by the Competition WG and on the Action Plan, MIC imposed a ban on SIM locks in principle (August 2021) and made institutional improvements to enable the early dissolution of existing contracts (January 2022). In addition, mobile phone carriers have made progress in establishing a fair competitive environment in the mobile market by eliminating penalty fees, launching carrier e-mail portability services, introducing eSIMs, and pursuing other initiatives. Subsequently, the system was revised in December 2023 to include regulations on discounts for

unlocked phones (SIM-free phones) based on the findings of a study by the Competition WG under Article 6 (consideration clause) of the Supplementary Provisions of the Act to Partly Amend the Telecommunications Business Act (Act No. 5 of 2019). In line with the "Plan for Promoting Competition in the Mobile Market to Enrich Everyday Life" (hereinafter, the "Mobile Market Competition Promotion Plan") published by MIC in November 2023, the Competition WG focused its consideration on (1) measures to further promote competition in the mobile market and (2) measures to revitalize the new and used handset market. In December 2024, the system was revised to relax the maximum discount amount for millimeter-wave compatible terminals based on the "2024 Report on the Verification of Competition Rules" that summarized the Competition WG's findings.

MIC is also working to promote understanding among users through consumer groups, etc. In December 2020, a "Mobile Phone Portal Site" was opened on the MIC website to offer impartial information with the aims of helping users select a plan that best suits their needs and furthering understanding among consumers. In keeping with the Mobile Market Competition Promotion Plan, MIC conducted a publicity campaign in conjunction with the animation "Gegege no Kitaro (6th Season)" through the end of March 2025 to improve user understanding of the key points of the mobile phone rate plan review, the MNP one-stop service, etc.



Figure (related data): Mobile phone portal sites

URL: https://www.soumu.go.jp/menu_seisaku/ictseisaku/keitai_portal/

(2) Development of rules on interconnection charges and other related regulations

A Review in light of changing circumstances in voice communications

With regard to connections for voice services such as telephone services provided by NTT EAST and WEST (voice connections), the Information and Communications Council deliberated on the appropriate approach to voice interconnection charges after transitioning to IP networks, taking into consideration the fact that the transition from fixed-line telephone networks to IP networks was completed in December 2024.

Based on the Council's June 2024 report, MIC defined the functions related to incoming and outgoing calls on metal IP phones, wireless fixed-line phones, and Hikari

phones as a single statutory function (combination applicable connection), stipulated methods for the calculation of interconnection charges from January 2025 onward in order to set the same interconnection charges for metal IP phones, wireless fixed-line phones, and Hikari phones after the transition of fixed-line telephone networks to IP networks (Ministerial Order for the Partial Amendment of the Regulations for the Enforcement of the Telecommunications Business Act, etc. (MIC Ministerial Order No. 110 of 2024).

B Revision of calculation method for mobile interconnection charges, etc.

The Telecommunications Business Act imposes rules (designated telecommunications facilities system) on specific carriers that install major networks to ensure the fairness and transparency of interconnection charges and conditions as well as connection promptness. MIC is working to ensure the appropriateness of interconnection charges for designated telecommunications facilities in administrative procedures such as approvals and notifications, and to improve the appropriateness of the calculation methods for these charges through discussions by the "Study Group on the Calculation of Interconnection Charges".

With regard to connection fees for MNO networks in mobile communications (mobile interconnection charges), a review of the approach for calculating both voice and data communication interconnection charges (the

criteria for allocating expenses and assets) in the FY2023 interconnection accounting of MNO companies was conducted based on Study Group discussions. In line with the outcomes of the Study Group's review, MIC revised the "Guidelines on the Application of the Telecommunications Business Act and the Radio Act to MVNOs" in March 2025 and also made the necessary institutional improvements (Ministerial Ordinance Partially Amending the Accounting Rules for Interconnections of Category II Designated Telecommunications Facilities [2025 MIC Ordinance No. 42]) in April 2025. Based on the September 2024 "Eighth Report of the Study Group on the Calculation of Interconnection charges", MIC will verify the status of negotiations among operators on the release of 5G (Standalone) functions and consider future interconnection rules, etc.

C Review of the system for wholesale telecommunications services

With regard to wholesale telecommunications services provided using designated telecommunications facilities, the Act Partially Amending the Telecommunications Business Act (Act No. 70 of 2022) imposed on wholesale telecommunications service providers the obligation to provide services that have a significant impact on proper competitive relations between providers and the obligation to present information in negotiations in order to rectify the negotiating advantages of wholesale suppliers and to ensure the appropriateness of discussions between wholesale providers and wholesale customers.

MIC has made continued efforts to properly juxtapose "Interconnection" and "Wholesale Telecommunications Services" usage patterns in the use of Category I and Category II designated telecommunications facilities by pursuing active and substantive consultations on the provision of wholesale telecommunications services, e.g., having the Study Group on Calculation of Interconnection Charges etc. verify the status of consultations and system operation after the revised act goes into effect and holding discussions on verifying wholesale fees focusing on the substitutability of wholesale telecommunications services and connection functions.

4. Development and maintenance of digital infrastructure

(1) Formulation of "Digital Infrastructure Development Plan 2030"

To maintain Japan's growth potential in the midst of a population decline and increasingly diverse and complex community and social issues, DX must be accelerated by thoroughly utilizing generative AI and other digital technologies, and the digital infrastructure that will be indispensable for achieving this is becoming increasingly important.

In developing digital infrastructure, it has become necessary to develop new digital infrastructure for the AI era that will ensure computing resources such as data centers, whose demand will rapidly increase as the de-

velopment and use of generated AI goes into full swing, and that will accelerate the use of data in rural areas. It has also become necessary to put in place an environment that can be connected anywhere through multi-layered networks utilizing non-terrestrial networks to meet diversifying infrastructure needs in addition to improving 5G and optical fiber in order to support the use of this new digital infrastructure and cope with the increase in traffic caused by the digitalization of society and the use of new technologies.

The Noto region of Ishikawa Prefecture experienced

an earthquake in January 2024 that left communication services unavailable for an extended period of time due to power outages, disruption of transmission lines, etc. Among the challenges posed by such disasters are making communication infrastructure more robust in preparation for future disasters as well as enabling early recovery.

Given these circumstances, MIC formulated the “Digital Infrastructure Development Plan 2030” in June 2025 to promote the development of Japan’s digital infrastructure in an integrated and efficient manner by codifying policies for developing the necessary digital infrastructure and specific measures to realize these policies looking ahead to the end of FY2030.

(2) Promotion of Optical Fiber Installation

While the use of digital technology, including telework, remote education, and remote medical care, is strongly expected to resolve local issues, the development of digital infrastructure using optical fiber has been delayed in depopulated areas, remote islands, and other geographically disadvantaged locales due to the financial burden relative to the population¹.

In view of this background, MIC is implementing the “Advanced Wireless Environment Development Promotion Project” to partially subsidize project costs when local governments and telecommunications carriers install optical fiber, which is a prerequisite for high-speed, large-capacity wireless communications such as 5G. These subsidies will aid in covering the cost of upgrading fiber optic networks owned by local governments for

(3) Decentralization of data centers, submarine cables, etc.

Against the backdrop of rising Internet traffic and growing use of cloud computing and AI as DX moves ahead, the demand for data centers and submarine cables is increasing worldwide, and these digital infrastructures have become indispensable in supporting social life and economic activities. Approximately 90% of Japan’s data centers are located in urban areas such as Tokyo and Osaka, and this situation is expected to continue. Landing stations, where international submarine cables terminate, are concentrated on or near the Boso and Shima peninsulas, while the Japan Sea side is the missing link for domestic submarine cables. Since telecommunication services may thus be affected on a nationwide scale in the event that the Tokyo and Osaka areas are damaged by earthquakes or other disasters, data centers need to be located in a more decentralized fashion and submarine cables installed on the Japan Sea coast from the perspective of making Japan’s digital infrastructure more resilient. As Japan is situated at the relay point between North America/Europe and the Asia-Pacific region, efforts must be made to construct more international submarine cables to Japan so that the country can establish itself as a hub for international data distribution and develop autonomous digital infrastructure. Furthermore, the increasingly complex secu-

Based on this Plan, MIC will pursue the development of digital infrastructure to support an AI society by eliminating areas with underdeveloped optical fiber networks, ensuring maintenance and management, spreading and expanding high-quality communication services that offer a “distinctively 5G” experience, decentralizing data centers, etc., through Watt-Bit Collaboration, and supporting the deployment of non-terrestrial networks (NTN) as well as by pursuing R&D and social implementation of next-generation information and telecommunications infrastructure (Beyond 5G) with all-photonic networks at the core and of quantum cryptographic communications.

transfer to the private sector as well as the cost of maintaining and managing optical fiber in remote island areas. MIC will strive in accordance with the “Digital Infrastructure Development Plan 2030” (formulated in June 2025) to increase the optical fiber coverage rate (household coverage rate) from 99.84% at the end of March 2023 to 99.9% by the end of March 2028.

MIC has greatly expanded its support, including higher subsidy rates, in the FY2024 supplementary budget and the FY2025 budget, and will continue to promote optical fiber installation in disadvantaged areas and work to enable local governments wishing to do so to quickly and smoothly transfer public facilities to the private sector.

ity environment surrounding Japan and other recent changes internationally require stronger security measures for international submarine cables and landing stations.

MIC created a fund to support private companies that develop data centers and submarine cables as part of the supplementary budget project for FY2021, and this fund is providing assistance to data center development projects located outside the Tokyo area. This fund was increased and branch lines and branching equipment for international submarine cables were added as new support targets in the FY2023 supplementary budget; efforts are being made to boost the number of routes for international submarine cables. The fund was further expanded in the FY2024 supplementary budget to begin providing support for data center development projects located outside the Tokyo area.

The emergence of generative AI and other factors are pushing up the computational power required for AI learning, etc., at an accelerating rate, making it imperative to secure large-scale computational resources for the sake of developing and utilizing generative AI going forward. At the same time, data centers tend to be concentrated in a few areas, and construction of new data centers may require the building of new substations and

¹ See Part II, Chapter 1, Section 2, “Trends in the Telecommunications Sector”

other large-scale grid augmentation. It is therefore important to promote effective collaboration between electric power and telecommunications (Watt-Bit Collaboration) by, for example, encouraging the siting of data centers in locations and regions deemed desirable from the viewpoint of electric power infrastructure, while systematically developing the necessary telecommunications infrastructure commensurate with such locations.

Hence, MIC teamed up with METI to launch the “Public-Private Advisory Council on Watt-Bit Collaboration” in March 2025 as a forum for cooperation and coordina-

tion among the public and private actors concerned, in accord with the instructions issued by the Prime Minister at the February 2025 meeting of the Meeting on Digital Administrative and Fiscal Reform. In June 2025, the Advisory Council compiled the “Summary 1.0 of Public-Private Advisory Council on Watt-Bit Collaboration” after identifying conditions and issues pertinent to the future development of desirable data centers. MIC will continue to promote measures such as regional decentralization of data centers on the basis of Advisory Council discussions.

(4) Maintain and ensure broadband service provision

The Act for Partial Amendment of the Telecommunications Business Act (Act No. 70 of 2022, enforced on June 16, 2023) newly positioned broadband services – essential for telework, remote education, remote medical care and other services – as an Item (ii) Universal Telecommunications Service² under the Telecommunications Business Act. To ensure the appropriate, fair, and stable provision of broadband services, a new system (Universal Service System for Broadband Services) was established to offer subsidies from the contributions collected from broadband service providers nationwide.

To begin operating this subsidy system, MIC revised the pertinent ordinances based on the “Calculation of Subsidies and Contributions under the Universal Service System for Broadband Services” (a March 2024 re-

port from the Information and Communications Council) and other relevant documents. In 2024, MIC designated 30,000+ of the approximately 230,000 towns and districts nationwide as “support zones” for the calculation of subsidies, based on criteria such as the deficits expected to be incurred in providing broadband services³.

In March 2025, MIC designated the Type II Qualified Telecommunications Carriers eligible for the subsidy, and the Regulations for Calculating Type II Grants and Type II Contributions for the Provision of Item (ii) Universal Telecommunications Service (MIC Ordinance No. 16 of 2025) and other rules came into effect in April 2025; MIC is now making the necessary preparations for starting the subsidy system by FY2026.

5. Ensure the safety and reliability of telecommunications infrastructure

(1) Institutional improvements to technical standards for telecommunications equipment, etc.

With virtualization technology being introduced into telecommunications networks, cloud service utilization advancing, and telecommunications service provision structures becoming more diverse and complex, the IP Network Facilities Subcommittee of the Department on Information and Communications Technology under the Information and Communications Council spent the period April 2022 to February 2023 examining the technical conditions for the telecommunications equipment needed to support increasingly diverse and complex networks appearing in the wake of technological advances in virtualization.

The partial report prepared by the Information and Communications Council based on its first report⁴ compiled in September 2022 indicated with regard to MVNOs, etc., to be designated as voice transmission mobile phone numbers that it would be appropriate to apply the same technical standards as those currently imposed on

MNOs’ mobile phone facilities. Following a subsequent report by the Information and Communications Administration and Postal Administration Council⁵, the Ministerial Ordinance Partially Amending the Regulations for the Enforcement of the Telecommunications Business Act, etc., to relax conditions for the designation of voice transmission mobile phone numbers went into effect in February 2023.

The Committee also studied technical conditions for telecommunications facilities in light of advances in virtualization technology, etc., as well as technical conditions pertaining to situations deemed vulnerable to serious incidents, and compiled these as a second report in February 2023. Based on the partial report of the Information and Communications Council, the Regulations for the Enforcement of the Telecommunications Business Act, etc.⁶, previously revised to incorporate the technical conditions pertaining to situations deemed

² Specifically, FTTH access services, HFC-based CATV access services and dedicated wireless fixed broadband access services fall under Item (ii) Universal Telecommunications Services.

³ 16,256 towns/districts as general support zones and 14,394 towns/districts as special support zones

⁴ Partial Report from the Information and Communications Council on “Technical Conditions for Telecommunications Facilities Adapting to Increased Network Diversification and Complexity Driven by Advances in Virtualization Technology, etc.” (September 16, 2022): https://www.soumu.go.jp/menu_news/s-news/01kiban05_02000253.html

⁵ Results of the Solicitation for Public Comments on the Partial Revision of the Regulations for the Enforcement of the Telecommunications Business Act and Report from the Information and Communications Administration and Postal Administration Council (January 20, 2023): https://www.soumu.go.jp/menu_news/s-news/01kiban06_02000100.html

⁶ Partial Report from the Information and Communications Council on “Technical Conditions for Telecommunications Facilities Adapting to Increased Network Diversification and Complexity Driven by Advances in Virtualization Technology, etc.” (February 24, 2023): https://www.soumu.go.jp/menu_news/s-news/01kiban05_02000283.html

vulnerable to serious incidents, were revised again in June 2023 in accordance with the technical conditions for telecommunications facilities required in light of ad-

(2) Ensuring communication services during emergencies

A Establishing standards for measures to be taken by telecommunications carriers, etc.

In recent years, Japan has experienced frequent natural disasters such as earthquakes, typhoons, heavy rain, heavy snow, floods, landslides, and volcanic eruptions, which have also disrupted communication services due to power outages, communication equipment failure, and cable breaks.

MIC has revised the “Information and Communications Network Safety and Reliability Standards” (Ministry of Posts and Telecommunications Notification No. 73, of 1987), which stipulates earthquake resistance, power outage countermeasures, and fire prevention measures to be implemented by telecommunications carriers as needed to ensure communication services during disasters. Revisions were made in March 2025, in light of the January 2024 earthquake that hit the Noto region of Ishikawa Pre-

vances in virtualization technology, etc.; these revisions went into effect in January 2024.

ecture, to enhance power outage countermeasures at mobile phone base stations and other facilities.

Since October 2018, “Liaison Meetings on Securing Communication Services in the Event of Disasters” have been held with designated public agencies to reflect on disaster responses previously and to share information and exchange opinions on the systems in place for immediate response and cooperation, rapid damage assessments, and issues to be addressed in undertaking recovery efforts. In addition, MIC is using the information obtained on these opportunities to establish a liaison system between telecommunication carriers and organizations related to electric power, fuel, and fallen tree disposal, as well as to conduct initial response training and pursue other forms of coordination.

B Efforts of the “MIC-TEAM” (MIC Disaster Telecom Support Team)

MIC launched the “MIC-TEAM” (MIC Disaster Telecom Support Team) in June 2020 to provide disaster response support for securing information and communication means. MIC-TEAM is dispatched to local governments in disaster-stricken areas when a large-scale disaster occurs or is likely to occur, and is responsible for assessing damage to information and telecommunications services, coordinating with relevant administrative agencies and businesses, and providing technical advice to local governments as well as lending mobile power vehicles and offering other assistance. In

2024, MIC-TEAM was dispatched to local governments affected by natural disasters, including the January earthquake in the Noto region of Ishikawa Prefecture and the September torrential rains on the Noto Peninsula.

To address issues pertaining to collaboration and cooperation in power supply, fuel supply, and fallen tree disposal, MIC conducted cooperative drills with Yamaguchi and Okinawa prefectures in FY2024 to test the initial response capabilities of telecommunications carriers and other related organizations.

C Studying the mutual use of networks among mobile phone carriers, etc.

Since mobile phone service is an indispensable lifeline for people’s daily lives and economic activities, the challenge is to create an environment in which mobile phone users can continue to use communication services even in the event of natural disasters or communication breakdowns through “inter-carrier roaming in emergencies” that allows users temporary access to other carriers’ networks. To that end, MIC organized a “Study Group on Intercarrier Roaming in Emergency Situations” in September 2022 that compiled and published its first report in December of that same year outlining a basic policy of introducing inter-operator roaming in emergencies as soon as possible through a full roaming approach that enables not only emergency calls, general calls and data communications but also return calls from the organizations handling emergency calls.

The Study Group compiled its second report in June 2023 on the policy of introducing – in parallel with a full-roaming system – a roaming system that enables emergency calls to be sent out even in the event that the user authentication of the core network required to receive return calls from the organizations handling emergency calls has been disabled. In May 2024, a third report was compiled on the basic concept of inter-carrier roaming

in emergencies that set out a schedule for introducing both systems around the end of FY2025.

To ensure more in-depth policy making deliberations covering topics such as the development of technical standards based on the findings of the aforementioned study, MIC reassigned these deliberations to the IP Network Facilities Subcommittee of the Department on Information and Communications Technology under the Information and Communications Council in August 2024, and the Council submitted a partial report on technical standards for terminal facilities in December of the same year.

In January 2025, the Information and Communications Administration and Postal Administration Council was consulted on revisions to relevant ministerial ordinances based on this report, and the Council issued its report in March. The revised ministerial ordinances on this matter were promulgated in May and are scheduled to go into effect in October of this year.

The Information and Communications Council is still considering the appropriate approaches for operational rules and user awareness to ensure the smooth introduction of inter-carrier roaming in emergencies.

MIC will continue pursuing the studies, verifications, etc., necessary to realize inter-carrier roaming in emergencies.

(3) Analyzing and verifying telecommunication accidents

To prevent telecommunication accidents or reduce their impact, appropriate measures must be taken when these accidents occur and thereafter, in addition to measures taken in advance. Since 2015, MIC has held “Telecommunications Accident Verification Meetings” to analyze and verify reports mainly covering “serious accidents” and “situations that are deemed likely to cause serious accidents” as defined in the Telecommunications Business Act and “quarterly reportable accidents” as defined in the Telecommunications Business Reporting Rules. Participants in the September 2024 meeting compiled the verification results for telecommunication accidents that had occurred in FY2023 and published the “Verification Report on Telecommunication Accidents in FY2023”; they also continued verifying the telecommunication accidents that occurred in FY2024.

Many common issues are thought to be behind the high number of telecommunication accidents, including risk identification and assessment, human error prevention and training, and maintenance and operational posture. The “Report on the Verification of Structural Prob-

lems Related to Telecommunications Accidents” compiled in March 2024 covered reviews of technical standards, management regulations and other rules/regulations based on structural problems in the organizations and systems behind individual accidents as well as verification of these structural problems, and approaches on strengthening governance of maintenance and operational systems pertinent to safety measures. Based on the details contained in this report, the “Basic Policy on Monitoring to Ensure the Safety and Reliability of Telecommunication Services” was formulated in July of that same year with the aim of having government authorities monitor compliance with laws and regulations to ensure the safety and reliability of telecommunication services, complementing the various efforts being made by telecommunication carriers themselves; verification was conducted in the program’s first year FY2023. A summary of the deliberations was reported at the Telecommunications Accident Verification Meeting in June 2024 and an overview of the results made public; verification for FY2024 began in August of that year.

6. Establishing safe and secure usage environments for telecommunications services

(1) Ensuring governance in the telecommunications sector

The telecommunications business is essential to the pursuit of breakthrough innovations in the information and communication sector and various other fields, and the industry needs to provide users with secure and reliable telecommunications services from the perspective of offering innovative services and encouraging DX in society by introducing digital technologies.

In May 2021, MIC convened a meeting of the “Telecommunications Carriers’ Governance Panel” to consider how to establish governance of telecommunications carriers’ cybersecurity measures and data handling and to study future measures for ensuring safe, secure, and reliable telecommunications services and networks in the digital age. Based on the Panel’s recommendations, a law was enacted in June 2022 to partially amend the Telecommunications Business Act, establishing new requirements, such as formulating and registering information handling rules, and setting out new rules to ensure the smooth provision of telecommunications services, including rules on cooperative measures among carriers to combat cyberattacks and on an accident reporting system, in order to promote the proper handling of user information, especially by telecommunications

carriers that acquire and manage large volumes of information, while maintaining consistency with the regulations of other countries. MIC subsequently held meetings of the “Working Group on the Proper Handling of Specified User Information” from June to September 2022 to study the details of regulations concerning the handling of specified user information. The Regulations for Enforcement of the Telecommunications Business Act were revised to provide for (1) items to be included in regulations for handling information, (2) items to be included in information handling policies, (3) evaluation items for the handling of specified user information, (4) requirements for the general manager of specified user information, and (5) reporting requirements in the event of a data breach. The Act and the revised Regulations for the Enforcement of the Telecommunications Business Act came into effect in June 2023. In December of that year, a public notice was issued designating those telecommunications carriers responsible for properly handling specified user information in accordance with the Regulations Concerning the Handling of Specified User Information, and these designations became effective in January 2024.

(2) Establishment of consumer protection rules in the telecommunications business sector

A Summary

While the sophistication and diversification of telecommunications services have brought improved convenience and greater choice to many users, the information gap between users and service providers as well as inappropriate solicitations by service providers have also caused problems. To prevent such problems and

enable consumers to enjoy the benefits of increasingly sophisticated and diversified telecommunications services, MIC has established consumer protection rules for telecommunications services, enforcing them appropriately and reviewing them as necessary.

B Ensuring the effectiveness of consumer protection rules

(A) Receipt of complaints, consultations, etc., coordination with relevant parties, and administrative guidance

MIC has established the “MIC Telecommunications Consumer Consultation Center” to accept information from consumers⁷. In addition, telecommunications consumer support liaison meetings⁸ are held twice a year in every region of Japan to share information and exchange opinions among the parties concerned. Based on the information obtained through these efforts, MIC is work-

ing to ensure the effectiveness of consumer protection rules for telecommunications services through administrative guidance and, as necessary, measures taken in cooperation with the Consumer Affairs Agency.

MIC also encourages voluntary efforts by relevant organizations to comply with consumer protection rules.

(B) Monitoring

MIC has formulated the “Basic Policy for Supervision of Consumer Protection Rules in the Telecommunications Business,” and holds a “Regular Meeting for Monitoring the Implementation Status of Consumer Protection Rules⁹” twice a year with the participation of experts and related business organizations to monitor the implementation status of consumer protection rules and to share and evaluate the findings among relevant parties.

These meetings analyze complaints and consultations in the telecommunications business sector, ascertaining not only overall trends but also trends by service type (e.g., MNO, MVNO, and FTTH). The meetings also evaluate and summarize the implementation of consumer protection rules by compiling the results of analyses

of individual topics¹⁰, on-site investigations (undercover investigations), investigations of individual cases¹¹ as needed, as well as complaints and consultations received by trade associations. Improvement efforts by businesses and others are also followed up.

Based on the assessments made at this meeting, MIC has provided guidance to the telecommunications carriers that were subject to on-site inspections on points that need to be improved, and has asked trade associations to take industry-wide action and to keep their members informed. The analysis results and evaluations from this meeting are also being used in considering revisions of consumer protection rules and in promoting voluntary efforts by business operators.

C Review of consumer protection rules

MIC has been reviewing and expanding its consumer protection rules in light of changes in the telecommunications market and consumer troubles. The Ministerial Ordinance for the Enforcement of the Telecommunications Business Act was amended in 2022 to introduce restrictions on penalty fees, etc. for contract cancellations, while establishing transitional measures to suspend the application of those caps to provisions to existing contracts, etc., “for the time being”. The Study Group on Consumer Protection Rules pointed out that institutional improvements should be promptly made so that the aforementioned transitional measures can be abolished. Accordingly, the Ministerial Ordinance for the Enforcement of the Telecommunications Business Act was revised in April 2024¹² to clarify the timing with which aforementioned transitional measures will be abolished. Consequently, the measures have become no more applicable to renewed contracts since July 2025 and will be completely abolished at the end of June 2028.

The Study Group also checked and evaluated the enforcement of the Ministerial Ordinance for the Enforce-

ment of the Telecommunications Business Act amended in 2022, the state of consumer protection in online contracts, and business operators’ performance of their duty to provide guidance to their sales intermediaries, and in August 2024 compiled the “2024 Report of the Study Group on Consumer Protection Rules”. Based on this report, the “Guidelines on the Consumer Protection Rules of the Telecommunications Business Act” were revised to clearly indicate that it is desirable to provide a final confirmation screen as a means of ensuring users have an appropriate understanding of online contracts, and to offer desirable and inappropriate examples of online contracts to encourage telecommunications carriers to take appropriate measures in dealing with “dark patterns” in such contracts. Since December 2024, the Study Group has been discussing ways of improving users’ understanding of the explanations given for provision terms and conditions, additional cost added to each handset price by sales intermediaries (customarily referred to as “initial deposit”)¹³, the status of provision of fixed Wi-Fi services, and other issues.

⁷ MIC received 9,970 complaints and consultations by telephone and via the Internet in FY2024.

⁸ A liaison meeting organized by MIC to exchange opinions on how consumer support for telecommunications services should be provided, with the Consumer Affairs Centers and telecommunications carrier organizations from various regions among the participants.

⁹ Regular Meeting for Monitoring the Implementation Status of Consumer Protection Rules:
https://www.soumu.go.jp/main_sosiki/kenkyu/shouhisha_hogorule/index.html

¹⁰ The 17th meeting held in July 2024 dealt with (1) consultations on complaints about communication speed, etc., (2) consultations on complaints by elderly persons, (3) consultations on complaints about FTTH telemarketing, and (4) consultations on complaints about on-site sales.

¹¹ Telecommunications Carriers Association and National Association of Mobile Phone Distributors

¹² Ministerial Ordinance Partially Amending the Ministerial Ordinance Partially Amending the Ordinance for Enforcement of the Telecommunications Business Act (Ministerial Ordinance No. 42 of 2024)

¹³ Handset sales prices vary from store to store and are set in a manner that includes a predetermined installment payment amount for installment payments as well as an amount set by each store (in some cases, zero yen).

(3) Protection of secrecy of communications confidentiality and user information

A Summary

People, objects, and organizations are connected to the Internet through smartphones and IoT, and the enormous amounts of digital data being generated and accumulated is undergoing dramatic evolution. The results of AI-based data analysis are being fed back to the real world, leading toward the realization of Society 5.0 that will resolve various social issues.

In this context, platform providers offering a range of services free of charge have become increasingly prominent, and user information is increasingly being collected and stored. As services essential for everyday life

are provided by platform operators via smartphones and other devices and the importance of platform operators in people's daily lives continues to grow, more sensitive information is also being collected and stored.

To ensure a proper balance between user convenience and the protection of secrecy of communication and privacy and to make certain that platform functions are fully utilized, it is important that platform operators enhance the appeal of their services and ensure the appropriate handling of user information so that users can use their services with confidence.

B Considerations for further protection of user information

The “Interim Summary” (September 2021), compiled based on the results of discussions by the “Working Group on the Handling of User Information for Platform Services” set up by the “Study Group on Platform Services”, states that MIC should, regarding the content and scope of rules and regulations, move ahead in considering the specific institutionalization of the handling of user information, including cookies and location information, while referencing the discussions on the draft EU e-Privacy Regulation. In line with this summary, the Act for Partial Amendment of the Telecommunications Business Act was enacted in June 2022 to require telecommunications carriers, when providing telecommunications services to users, to give users the opportunity for confirmation – via notifications, announcements, etc. – when sending telecommunications that instruct external transmission of user information (hereinafter referred to as the “external transmission rules”). MIC then convened the Working Group from June to September of that year to discuss the details of the external transmission rules and revised the Regulations for the

Enforcement of the Telecommunications Business Act to specify the parties subject to these rules, the matters to be notified/announced, and the methods of notification/announcement. The Act and the revised Regulations for the Enforcement Telecommunications Business Act came into effect in June 2023.

Since February 2024, to further protect user information, the “Study Group on the Improvement of ICT Service Usage Environments” and its “Working Group on User Information” have been discussing revisions to the “Smartphone Privacy Initiative (SPI),” which outlines desirable practices that application providers and other relevant businesses should adopt in handling user information on smartphones. In November of the same year, the Smartphone Privacy and Security Initiative (SPSI), which newly called for avoiding dark patterns and ensuring security, was announced in light of revisions to domestic systems, such as the introduction of external transmission rules, and changes in the trends seen among other countries and private operators.

7. Mediation, arbitration, etc., by the Telecommunications Dispute Settlement Commission

(1) Functions of the Telecommunications Dispute Settlement Commission

The Telecommunications Dispute Settlement Commission (hereinafter, the “Commission”) is a specialized organization established for the purpose of promptly and fairly handling increasingly diverse dispute cases in the telecommunications field, where technological innovation and competition are advancing rapidly. Currently, five members and eight special members appointed by the Minister for Internal Affairs and Communications are engaged in dispute resolution.

The Commission has three functions: (1) mediation and arbitration, (2) deliberations and reports in response to consultations from the Minister for Internal Affairs and Communications, and (3) recommendations

to the Minister.

The Commission's secretariat has established a consultation service desk for telecommunications and broadcasting companies through a dedicated consultation phone and email and responds to inquiries and consultations regarding disputes between telecommunications companies. Additionally, in order to help resolve disputes smoothly, the Commission has a dedicated website and has released a “Telecommunications Dispute Settlement Manual”, which provides explanations of the above procedures (1), (2), and (3) and offers a compilation of dispute cases, as well as pamphlets and other materials.



Figure (related data): Overview of the functions of the Telecommunications Dispute Settlement Committee
URL: https://www.soumu.go.jp/main_sosiki/hunso/outline/about.html

A Mediation/arbitration

Mediation is a procedure in which the Commission appoints a “mediation commissioner” from among its members and special members when a dispute arises between telecommunications carriers, broadcasters, etc. Mediation commissioner then encourages the parties involved to come to a compromise that constitutes a prompt and fair resolution of the dispute. If necessary, the mediation commissioner will present a mediation plan. Because the procedure is carried out by agreement of both parties, it is not mandatory, but any agreement reached by the two parties after going through the

mediation process constitutes a settlement under the Civil Code.

Arbitration is, in principle, a procedure in which the Commission appoints three persons from among its members and special members as arbitration commissioners based on the agreement of both parties, who agree to abide by the arbitral award made by the arbitration commissioners (arbitral tribunal); the arbitral award has the same effect as a final and binding judgment between the parties by applying the Arbitration Act *mutatis mutandis*.

B Deliberations and reports to consultations from the Minister for Internal Affairs and Communications

In the event that consultations between telecommunications carriers or between broadcasters are unsuccessful, the parties concerned may file a petition for a negotiation order or an application for a ruling with the Minister for Internal Affairs and Communications in accordance with the provisions of the Telecommunica-

tions Business Act or the Broadcasting Act.

The Minister for Internal Affairs and Communications must consult with the Commission when issuing these negotiation orders, rulings, etc. The Commission deliberates and submits reports on these matters after being consulted by the Minister.

C Recommendations to the Minister for Internal Affairs and Communications

The Commission may make recommendations to the Minister for Internal Affairs and Communications regarding improvements to competition rules that have been identified through mediation/arbitration and delib-

eration/reporting on consultations. Upon receipt of the Commission's recommendations, the Minister for Internal Affairs and Communications is to publicly announce the contents of the recommendations.

(2) Commission activities

In FY2024, the Commission deliberated and reported on a consultation from the Minister for Internal Affairs and Communications regarding a ruling on the details of an interconnection agreement with Colt Technology Services Co., Ltd filed by NTT DOCOMO, Inc., on January 31, 2023. The Commission received the consultation on March 22, 2024, subsequently deliberated on the ruling and submitted its reports on June 27, 2024.

There were no other applications for mediation or arbitration, but four cases were handled by the consulta-

tion service desk.

From the establishment of the Commission in November 2001 through the end of March 2025, the Commission processed 72 applications for mediation and three applications for arbitration, issued 12 reports in response to consultations from the Minister for Internal Affairs and Communications and presented three recommendations for the Minister of Internal Affairs and Communications.



Figure (related data): Mediation processing
URL: https://www.soumu.go.jp/main_sosiki/hunso/case/number.html

Section 3 Radio Policy Developments

1. Summary

(1) Past initiatives

Radio waves are a finite and scarce resource widely used to provide services essential to people's lives, such as mobile phones, police, firefighting, etc. Since radio waves are the common property of the citizenry, their fair and efficient use must be ensured. Specifically, radio waves cannot be used in an unregulated manner due to the nature of interference that occurs when the same frequency is used in the same area, and a system to ensure proper use is necessary. Since the propagation of radio waves and the amount of information that can be transmitted differ by frequency band, each frequency band must be used for suitable applications. Because radio waves can also propagate across national borders above a certain power output, it is necessary to establish treaties and other international agreements and to coordinate on the use of radio waves.

(2) Future issues and directions

Radio waves are becoming the foundation for new businesses such as next-generation mobility and smart society endeavors, as exemplified by the evolution from 5G to Beyond5G, and wireless networks are developing into integrated ones that encompass land, sea, air, and space. As digitalization progresses, wireless use is accelerating in addition to wired use, and the introduction of wireless technology is becoming an important key to the success or failure of digital businesses. The radio wave environment must be improved so that technological innovations can be implemented quickly as new wireless systems and services, leading to economic growth.

The Radio Act was enacted in 1950 to promote public welfare by ensuring the fair and efficient use of radio waves, replacing the old Wireless Telegraphy Act, which stated that “Wireless telegraphy and wireless telephony shall be managed by the government”. Japan has since promoted the private use of radio waves, which are the common property of the people, and radio waves have now become indispensable to people's lives.

MIC has been allocating frequencies and licensing radio stations under international coordination, as well as regulating radio use to ensure a favorable radio wave environment free from interference and disturbance, engaging in research and development to expand the radio spectrum, and conducting technical testing on effective uses of radio technology.

To further promote the effective use of radio waves to that end, the systems needed to realize non-terrestrial networks (NTN), etc., must be developed to cope with the expansion of radio wave use in all spaces. Radio station licensing procedures, etc., must be simplified, made more flexible, and expedited. Frequency migration, reorganization, and sharing must be promoted to meet the rapidly growing demand for radio frequencies. Measures that help bring about safe and secure societies, such as measures to cope with natural disasters and to ensure the proper use of radio waves, are also required.

2. Radio policy for digital business expansion

(1) Promoting the effective use of radio waves to expand digital business

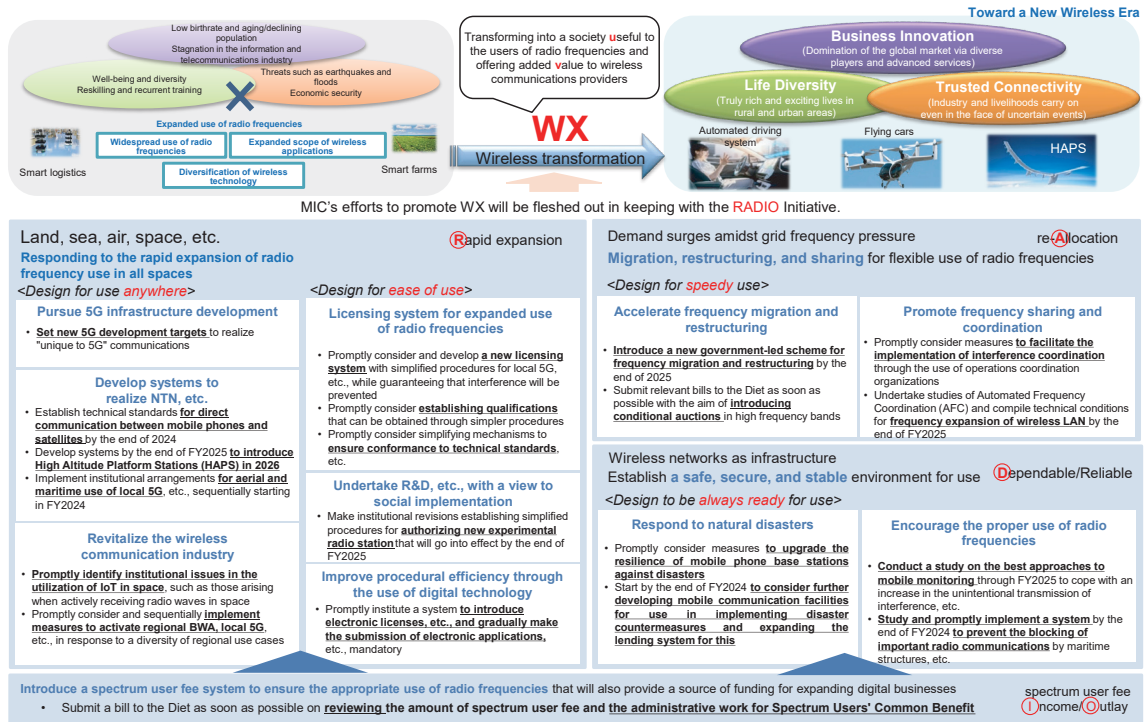
With the advancement of technology, the use of radio waves has spread and evolved in every space – including land, sea, air and space – and every socioeconomic activity, thus has become a source of innovative creation. It is therefore important to use radio waves as a foundation for growth in the digital society to further expand business opportunities.

Against this backdrop, MIC held meetings of the “Radio Policy Advisory Panel for Expanding Digital Business” from November 2023 to discuss the future vision of radio wave utilization, set new targets for the effective use of radio waves, and formulate measures to achieve them, all with a view to expanding digital business. The Panel submitted its findings via a report in August 2024.

Based on the Panel's discussions, MIC formulated the “WX Promotion Action Plan” (Figure 2-2-3-1), which specifies measures to be taken by MIC.

This Action Plan outlines MIC's efforts in pursuit of wireless transformation (WX): (1) responding to the rapid expansion of radio wave use in all spaces, including land, sea, air, and space; (2) migrating, reorganizing, and sharing frequencies to ensure the flexible use of radio waves, for which demand is rapidly increasing amid the frequency congestion; (3) developing an environment for secure, safe, and stable use of wireless networks as infrastructure; and (4) establishing a spectrum user fee system to ensure the appropriate use of radio waves as a source of digital business expansion.

Figure 2-2-3-1 WX Promotion Action Plan



(2) Measures to encourage the effective use of radio waves

MIC has implemented necessary institutional arrangements based on the report of the "Radio Policy Advisory Panel for Expanding Digital Business" and the WX Promotion Action Plan, and in February 2025 it submitted to the Diet a bill to partially amend the Radio Act and the Broadcasting Act that included the establishment of a system for selecting parties capable of setting

up specified high frequency radio stations based on price, the digitization of radio station licenses and certificates for basic broadcasters, and a revamping of the spectrum user fee system in order to promote the effective use of radio waves and streamline regulations in response to advances in information and communication technologies; the bill was passed into law in April 2025.

3. Digital infrastructure development

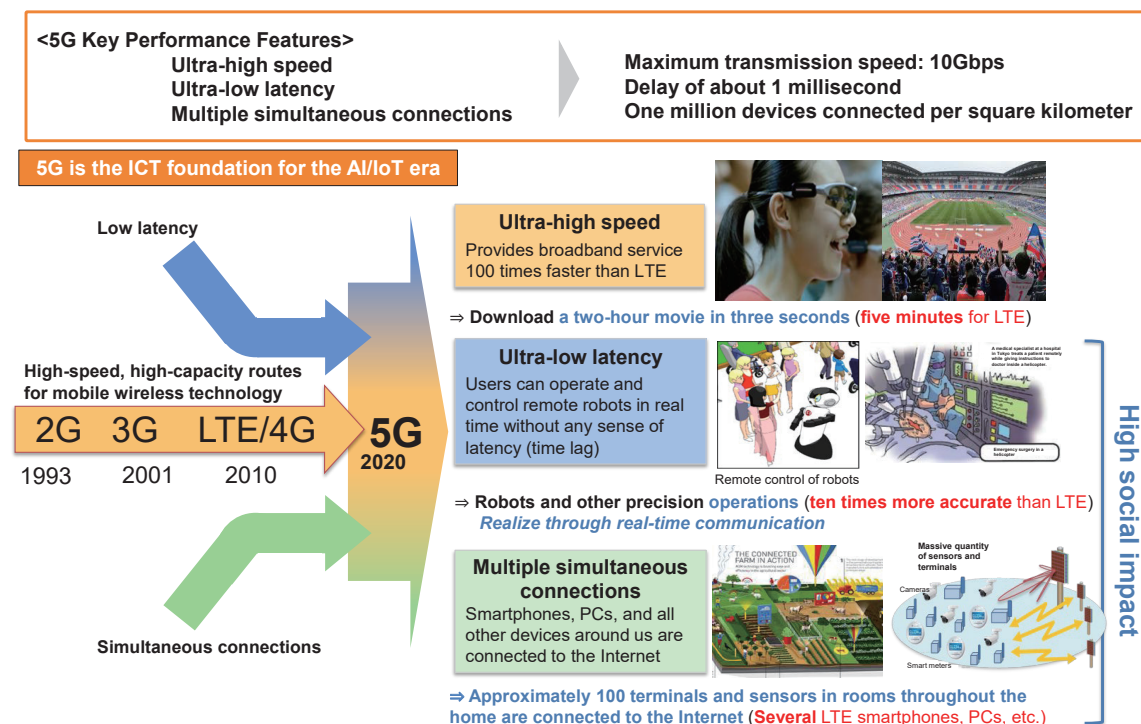
(1) 5G diffusion and deployment

A Features of 5G, etc.

5G will enable communications not only with ultra-high speed, an advancement of 4G, but also with ultra-low latency, which will enable the smooth operation of robots and other devices even in remote areas, and multiple simultaneous connections, with many devices connected to the network simultaneously (Figure 2-2-3-2). There are thus high expectations for 5G as an indispens-

able infrastructure for realizing an IoT society in which every "thing" is connected to the Internet. In fact, specific initiatives utilizing 5G are now underway in various regions and sectors, including automated tractor driving, product inspections using AI-based image analysis, and remote control of construction equipment.

Figure 2-2-3-2 5G features



MIC is actively contributing to the 5G international standardization activities of the International Telecommunication Union (ITU), based on the recognition that

5G will become part of the common global socioeconomic infrastructure.

B Development of 5G, etc., based on the “Digital Infrastructure Development Plan 2030”

Mobile networks, including 5G, have deeply penetrated people’s lives and economic activities, and their further enhancement is essential for digitalizing society as a whole and for maintaining and developing social functions in the midst of rapid population decline and aging.

In Japan, the government has implemented a series of institutional improvements and frequency allocations to promote the spread of 5G ever since the first allocation of frequencies for 5G in April 2019, and set a target in its “Infrastructure Development Plan for a Digital Garden City Nation” of achieving 5G population coverage of 95% nationwide by the end of FY2023. As a result, 5G infrastructure is steadily being developed, with the 5G population coverage reaching 98.1% nationwide as of the end of FY2023.

On the other hand, mobile communication volume is expected to further increase due to the spread of AI, etc., so, in addition to developing robust and well-balanced 5G infrastructure substantial enough to meet communication demand and usage scenarios and realizing advanced communication services utilizing 5G’s features, it is necessary to put in place a “connectivity everywhere” communication environment, including non-residential areas outside the 5G population coverage, from the viewpoints of local safety and security and regional revitalization.

Against this backdrop, MIC is following the aforementioned Digital Infrastructure Development Plan 2030 to promote the use of high-frequency bands (sub-6¹ and millimeter waves²) that permit high-speed, large-capacity communications and the spread of new technologies such as 5G SA (Stand Alone), which enables multiple simultaneous connections and communication services that take advantage of low latency. For roads and other non-residential areas where a communication environment needs to be established, the aim is to adopt a variety of means to make the necessary infrastructure improvements.

Specific measures to achieve this Plan include the allocation of new 5G frequencies, support for the development of 5G base stations in disadvantaged areas through subsidies under the “Mobile Phone Area Development Project,” assistance through tax measures, and promotion of infrastructure sharing.

Furthermore, MIC has taken an integrated approach in developing local digital infrastructure that flexibly combines local 5G and various other wireless systems and putting into practice advanced solutions that utilize this digital infrastructure in order to implement wireless and IoT solutions that meet local needs in ways that allow residents to experience first-hand the convenience of such solutions.

¹ The band above 3.6 GHz and below 6 GHz allocated for mobile phones

² The band above 6 GHz allocated for mobile phones

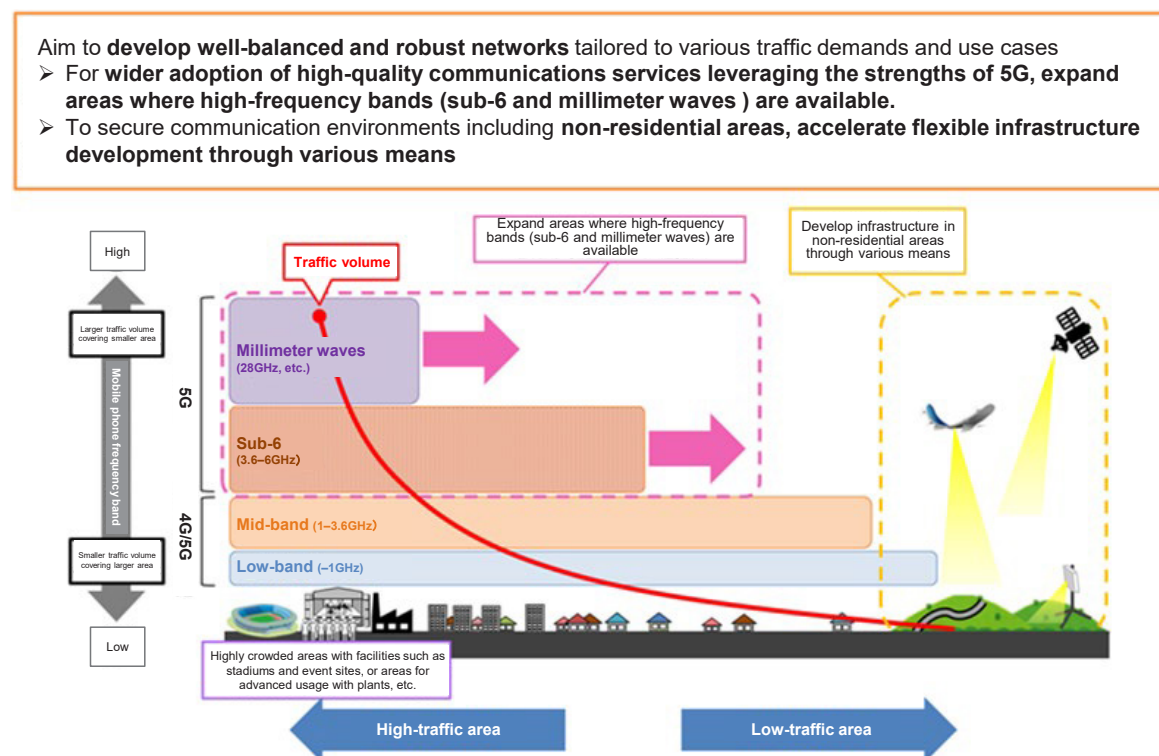
C Establishment of new development targets for 5G infrastructure

Further enhancement of the 5G infrastructure is necessary to provide users with distinctive 5G mobile phone services for the future 5G deployment phase.

Against this backdrop, MIC set new development targets for high frequency bands such as sub-6³ and ⁴millimeter wave, which can take advantage of the high-speed

and large-capacity communications characteristic of 5G, and for new technologies such as SA (Stand Alone), which offers multiple simultaneous connections and ultra-low latency, in the WX Promotion Strategy Action Plan it formulated in August 2024 (Figure 2-2-3-3).

Figure 2-2-3-3 Concept of Mobile Network Development to be Achieved by Around 2030



(2) Working to establish a connectivity environment that operates even during disasters

The earthquake that struck the Noto region of Ishikawa Prefecture in January 2024 had a tremendous impact on information and telecommunications infrastructure, causing mobile phone service to be unavailable for extended periods of time and hampering information acquisition and rescue efforts in the affected areas. Applying the lessons learned from this disaster, MIC decided

to promote efforts to make mobile phone base stations more robust through the installation of large-capacity storage batteries and the use of satellite links, in order to avoid outages at mobile phone base stations due to power blackouts or transmission line breaks during disasters.

(3) Beyond 5G

Beyond 5G (6G), the next generation of information and communications infrastructure, is expected to become the foundation for all industrial and social activities in the 2030s. MIC compiled the “Beyond 5G Promotion Strategy - Roadmap to 6G” in June 2020 and the “Strategy for Realizing Next-generation Information and Communications Infrastructure to Support an AI Society - Beyond 5G Promotion Strategy 2.0” in August 2024, both of which advocate, among other actions, thoroughly promoting and utilizing 5G, securing frequencies to meet growing traffic demand, and undertaking efforts to upgrade radio access networks (RANs).

In keeping with these strategies, MIC has been work-

ing on upgrading the interconnection and operational testing environment for base station equipment using open standards, improving the efficiency of RAN control using AI, developing the necessary systems for domestic introduction through technical demonstrations of High Altitude Platform Stations (HAPS), and conducting research and development related to high-speed, high-capacity HAPS communications.

The International Telecommunication Union’s Radio-communication Sector (ITU-R) is responsible for studying and formulating international standards for wireless communication technologies, radio frequencies, etc. Within ITU-R, Working Party 5D (WP5D) of Study

³ The band above 3.6 GHz and below 6 GHz allocated for mobile phones

⁴ The band above 6 GHz allocated for mobile phones

Group 5 (SG5), a special subgroup chaired by Japan whose area of focus is mobile communications, is working to develop standards for 6G with a target completion date of around 2030, and is also studying available frequency bands with 6G in mind. MIC is pursuing standardization activities within the Working Party by input-

ting documents contributed by the Japanese government in cooperation with relevant Japanese organizations and businesses, and plans to hold a meeting in Japan in June 2025 to maintain and enhance Japan's presence in the Working Party.

(4) “Beyond 5G-ready Showcase” at Expo 2025 Osaka/Kansai

As part of the initiatives based on the “Strategy for Realizing Next-generation Information and Communications Infrastructure to Support an AI Society - Beyond 5G Promotion Strategy 2.0”, MIC hosted the “Beyond 5G-ready Showcase” at Expo 2025 Osaka/Kansai from Monday, May 26 to Tuesday, June 3, 2025, to provide the world with information on Japan's Beyond 5G endeavors.

The event offered a wide range of Expo visitors the opportunity to experience an envisioned future society and lifestyle made possible by Beyond 5G, with an em-

phasis on reality and immersion. In conjunction with this, an exhibition of Japan's R&D and cutting-edge technologies relevant to Beyond 5G was held to promote international collaboration and standardization activities aimed at fostering connections, encouraging social implementation and international deployment (**Figure 2-2-3-4**).

A virtual event is also being held from Monday, May 26 to Monday, October 13, 2025 to allow visitors from Japan and abroad to experience the same content as the on-site event through an online virtual space.

Figure 2-2-3-4 Beyond 5G-ready Showcase venue layout and main contents



4. Promotion of advanced radio frequency utilization systems

(1) Non-terrestrial networks

Non-terrestrial networks (NTNs) such as HAPS and satellite communications can efficiently cover remote islands, maritime areas, and mountainous regions by connecting land, sea, air, and space, and can provide communication services even in areas where communication infrastructure is not yet developed. They are also useful as a means of communication in emergencies, including natural disasters.

Based on the “Digital Infrastructure Development Plan 2030” (formulated in June 2025), MIC is undertaking efforts to promote the introduction of services, including the development of systems pertinent to the early deployment of NTNs in Japan.

Specifically, MIC is pushing for the development of

domestic systems through technological demonstrations in addition to R&D support for HAPS, and is working with relevant government ministries and agencies for social implementation and overseas deployment. MIC is also striving to secure more frequencies to expand the frequencies available for HAPS. Japan led the discussions at the World Radiocommunication Conference 2023 (WRC-23), where it was decided that the 1.7 GHz, 2 GHz, and 2.6 GHz bands would be made available for the use of HAPS as mobile phone base stations worldwide, the 700 MHz band would be available region-wide in Region 1 (Europe and Africa) and Region 2 (North and South America), as well as in 14 countries including Japan in Region 3 (Asia).

In the area of satellite communications, MIC has introduced frameworks for a satellite constellation that will operate a large number of non-geostationary satellites in unison to provide high-speed, high-capacity communica-

tion services, and developed the necessary systems for direct communication services between mobile phone terminals and satellites; MIC remains committed to securing frequencies and developing systems as needed.

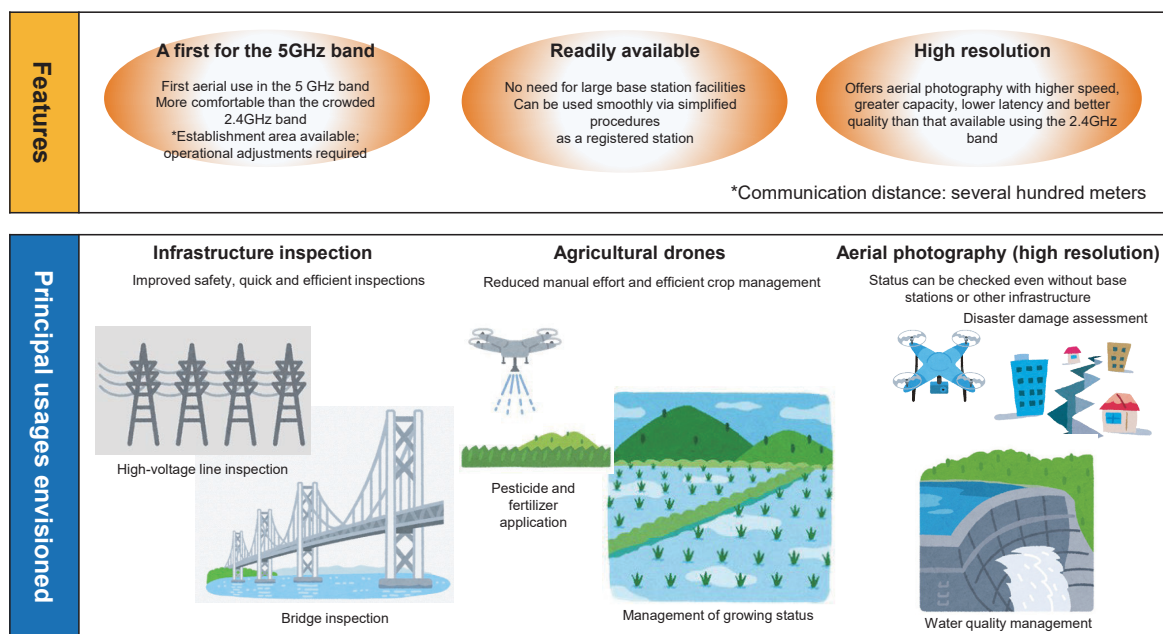
(2) Upgrading wireless LAN

Wireless LAN is a standard established by the Institute of Electrical and Electronics Engineers (IEEE) and used worldwide for smartphones and other devices. In Japan, access points have been installed in public places such as train stations and airports, and they have become one of the key communication infrastructures within the nation's social infrastructure, not only for offices and homes, but also for outdoor services, school education, and communications in disaster-stricken areas.

MIC continues to study the upgrading of wireless LANs based on their introduction in other countries and on domestic needs. The need for outdoor and aerial use of devices incorporating wireless LAN has increased in recent years due to the expanding use of drones and other

devices that utilize wireless LAN technology. In view of the current situation, especially the shortage of frequency channels available for aerial applications, studies were conducted from 2023 to expand aerial use of the 5 GHz band. The “Technical Conditions for Aerial Use of 5.2 GHz Band Wireless LAN” was compiled in December 2024, and the Radio Equipment Rules (Radio Regulatory Commission Rules No. 18 of 1950) and other regulations were amended in April 2025. With the introduction of 5.2GHz band wireless LAN for aerial applications, it is expected that its use will expand to infrastructure inspections of bridges and other structures, and to the creation of images from aerial photography (Figure 2-2-3-5).

Figure 2-2-3-5 Principal aerial usages of 5.2GHz band wireless LANs



Furthermore, MIC is studying the technical conditions for frequency sharing in connection with frequency band expansion, including outdoor use of the 6 GHz band (5925 MHz-6425 MHz) wireless LAN and outdoor use of the 6.5 GHz band (6425 MHz-7125 MHz), in order to establish wireless LAN systems that can cope with future mobile communication traffic growth and diverse

usage needs. In FY2024, MIC conducted a technical study on the Automated Frequency Coordination (AFC) system⁵, which is needed to prevent harmful interference to existing radio stations using the aforementioned frequency bands, for building and verifying the operation of this system as well as studies on a framework and operational model for operating the AFC system.

(3) Expansion of radio frequency use in drones

Recent years have seen drones used in a variety of fields, including agriculture, infrastructure inspection, logistics, disaster response, and entertainment. The uses of radio waves are essential when deploying drones. They include transmitting remote IDs that identify indi-

vidual drones, sending commands to control drones from the ground, and transmitting images taken by drones to pilots and other users, and suitable radio systems are used for each of these purposes (Figure 2-2-3-6).

⁵ A system that automatically notifies the user of available frequencies and maximum transmission power in order to avoid harmful interference to existing radio stations, etc., using the 6 GHz and 6.5 GHz bands.

Figure 2-2-3-6 Radio systems used for drones (as of December 2024)

Name/type of radio system	Frequency band	Maximum transmission power	(Reference) ^{*4} Transmission speed	(Reference) ^{*4} Communication distance	(Reference) ^{*4} Utilization	Radio station license	Characteristics, usages
Low-power radio for radio-controlled operation	73MHz band, etc.	*1	5kbps	About 1km	Piloting	Not required	Easy to use for hobby applications, etc. Mainly used in industry for pesticide spraying
Unmanned Mobile Image Transmission System	169MHz band	10mW	Up to several hundred kbps	About 5km	Piloting Image transmission Data transmission	Required	Mainly used for aerial photography, infrastructure inspections, surveying, etc. (used for piloting/control backup, etc.)
Specified low-power wireless base station	920MHz band	20mW	Up to 1Mbps	About 500m	Piloting	Not required ^{*2}	Used for piloting
2.4GHz band wireless LAN (low-power data communication system)	2.4GHz band (2400-2483.5 MHz)	10mw/MHz (3mW/MHz for FH system)	Up to 54Mbps	About 1km	Piloting Image transmission Data transmission	Not required ^{*2}	Most widely used for piloting, image transmission, and other applications. Crowded due to high number of users.
Unmanned Mobile Image Transmission System	2.4GHz band (2483.5 to 2494 MHz)	1W	Up to tens of Mbps	About 10km	Piloting Image transmission Data transmission	Required	Mainly used for aerial photography, infrastructure inspection, surveying, etc.
Unmanned Mobile Image Transmission System	5.7GHz band	1W	Tens of Mbps	About 5km	Piloting Image transmission Data transmission	Required	Mainly used for aerial photography, infrastructure inspection, surveying, etc.
Mobile phones (4G/5G) (limited to FDD)	800MHz band, etc.	200mW (base station control)	Tens of Mbps	Within mobile phone coverage area	Piloting Image transmission Data transmission	*3	Capable of out-of-sight communications and remote operation, and used for infrastructure inspection, logistics, video distribution, etc. Not available outside mobile phone coverage areas.

*1 At a distance of 500m, the electric field strength is 200μV/m or less

*2 Radio stations that do not require a license are limited to those using radio equipment that has received technical standards compliance certification or construction design certification confirming and certifying in advance that the radio equipment complies with the technical standards stipulated in the Radio Act.

*3 Operated under license by a mobile phone carrier

*4 Not stipulated in laws and regulations but based on interviews with manufacturers, etc.→Only radio equipment displaying the “Technical Conformity Mark” shown at right may be used.



MIC is pursuing efforts to improve the aerial radio wave environment in light of expanding needs for the utilization of drones. The principal efforts other than the aforementioned wireless LANs are as follows:

- Aerial use of mobile phones, etc.

Based on the need to mount mobile phones on drones, etc., and use mobile phone networks for drone control, image transmission, data transfer, etc., MIC developed a system in December 2020 to enable LTE aerial use in the 800MHz, 900MHz, 1.7GHz and 2GHz FDD frequency bands through simple procedures, and MIC removed altitude restrictions and enabled the use of 5G systems in April 2023. Furthermore, MIC set up a system in May 2025 to allow aerial use of the TDD frequency band used for 5G, local 5G, etc., in order to meet needs such as high-speed uploading of video data taken by drones, etc.

(4) Intelligent Transport Systems

Intelligent Transport Systems (ITS), which connect people, roads, and vehicles using information and communication technology, contribute to the safe and comfortable movement of people and goods by reducing traffic accidents and traffic congestion.

MIC has been allocating frequencies used in the Ve-

- Specific experimental test station for drones in the 5.8GHz band

Drones using the 5.8 GHz band are widely employed in the United States, Europe, China, South Korea, and other countries. In Japan, the 5.8 GHz band is used for DSRC, a wireless system for ITS, etc., but given the need to test functionality on the same 5.8 GHz band in Japan, MIC has worked to include the 5.8 GHz band under the focus of a specified experimental testing station system that allows the establishment of experimental testing stations through simple procedures. After studying conditions such as frequencies that do not affect existing DSRC and other radio stations and areas where they will be used, MIC promulgated a public notice on 5.8 GHz-band specific experimental test stations for drones in November 2024.

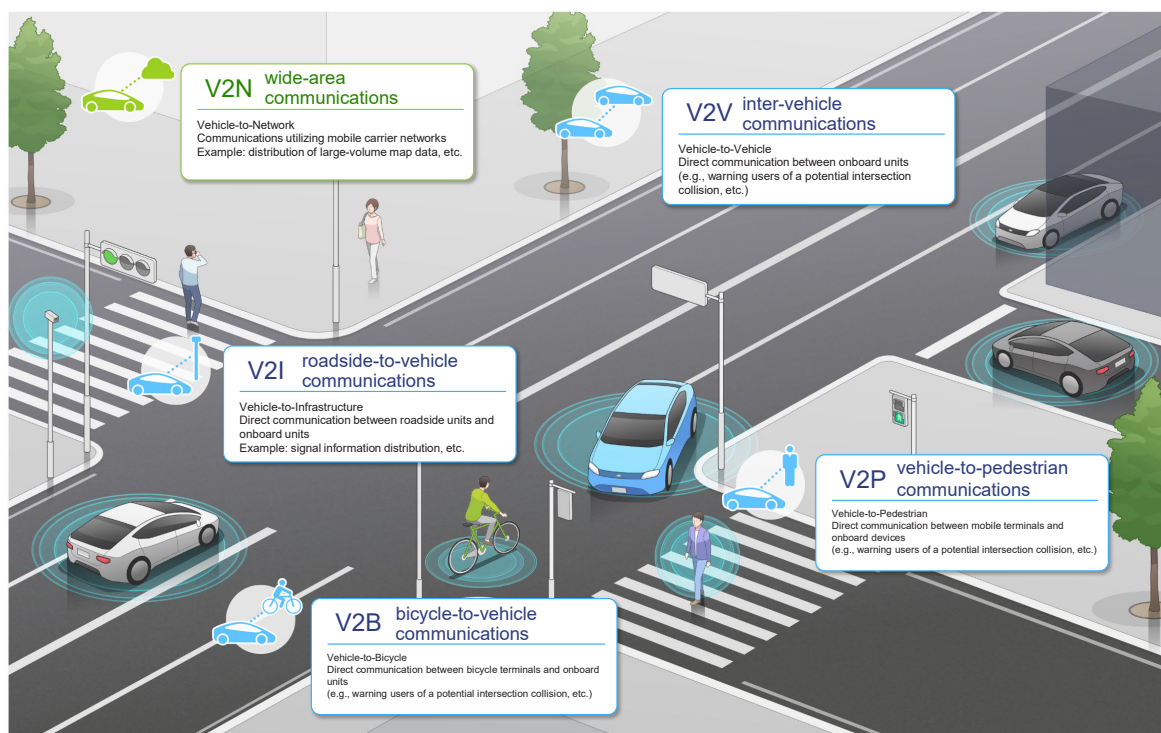
hicle Information and Communication System (VICS), the Electronic Toll Collection System (ETC), on-board radar systems, and 700 MHz-band Intelligent Transport Systems, formulating technical standards for these systems, and promoting their diffusion.

Automated driving is currently being tested and im-

plemented worldwide, mainly in Europe and the US. In addition to onboard sensors such as cameras and radar, V2X (vehicle to everything) communication, which exchanges information with surrounding vehicles and

roadside infrastructure, is expected to play an important role in the realization of advanced automated driving such as merge and diverge assistance (Figure 2-2-3-7).

Figure 2-2-3-7 V2X communication



Given that V2X communication systems utilizing the 5.9 GHz band are being tested and implemented worldwide, Japan is also studying the idea of additionally allocating the 5.9 GHz band for V2X communication. After MIC's "Study Group on Next-generation ITS Communications in the Era of Automated Driving" concluded in August 2023 to consider allocating up to 30 MHz between 5,895 MHz and 5,925 MHz for V2X communications, taking into consideration international frequency harmonization, interference with existing radio stations, and other factors, 20.5 billion yen was allocated in the FY2023 supplementary budget to "Project for Development of Digital Infrastructure for the Social Implementation of Automated Driving"; the environment is now being established for the early introduction of V2X communications in the 5.9 GHz band. The "Automated Driving Infrastructure Panel" jointly established by the

Ministry of Land, Infrastructure, Transport and Tourism, the National Police Agency and MIC has been discussing the infrastructure most conducive to automated driving since June 2024. Based on the Panel's discussions, MIC will begin working in cooperation with relevant ministries and agencies on an automated driving truck demonstration using 5.9 GHz-band V2X and V2N communications on the Shin-Toumei Expressway and other roads in FY2025.

In addition, MIC is contributing to draft reports prepared by the International Telecommunication Union's Radiocommunication Sector (ITU-R), disseminating information at international conferences such as the ITS World Congress, and promoting the spread of Japanese technology in India and other Asian countries in order to aid in the international standardization and overseas deployment of Japan's ITS technology.

(5) Spatial transmission wireless power transmission systems

Spatial transmission wireless power transmission systems transmit power over a distance of several meters by sending and receiving radio waves without a wired connection, and they are expected to be used to supply power to sensor devices used in factories. These systems enable low power supply without connecting charging cables or replacing batteries, which should improve convenience and enable flexible installation of sensor devices, helping bring about Society 5.0 through

the use of IoT.

Based on past studies on frequency sharing with other radio systems, radio safety, technical conditions, and the establishment of a smooth operational coordination mechanism, etc., for the practical application of these systems, MIC in May 2022 established a system for on-premises radio stations in the three frequency bands of 920 MHz, 2.4 GHz, and 5.7 GHz for use indoors if certain requirements are met.

5. Promoting overseas deployment of radio wave systems

Radio monitoring systems and other technologies/systems are playing an increasingly significant role in ensuring the safe and secure use of radio waves, and their importance has been recognized in Southeast Asian countries, where the use of radio waves is rapidly expanding, and elsewhere. It is therefore vital that Japan contribute to the international community by deploying overseas those radio systems for which Japan has superior technology and by developing Japan's radio infrastructure and services into promising businesses that are internationally competitive, spurring further growth in its own economy. The public and private sectors are cooperating from this perspective in pursuing strategic initiatives for the global development of radio systems deemed to be among Japan's strengths, with a focus on Asian countries. Specifically, MIC has been implementing the "Project for Promoting the International Cooperative Use of Frequencies" since FY2017 for the purpose of ensuring the global superiority of these technologies through the overseas deployment of radio systems, and it has been conducting demonstration testing in Japan and overseas as well as people-to-people exchanges at the user level so that technologies that use frequencies quite efficiently in ways that accord with ra-

dio frequency conditions in Japan can be established as international standards.

In response to growing global demand for secure and reliable digital infrastructure, MIC is also working on the overseas deployment of Japanese companies' Open RAN and vRAN as well as systems that utilize these. In Southeast Asian countries such as the Philippines, for example, MIC is conducting surveys and testing for the deployment of Open RAN and advocating wider adoption of Open 5G.

"Japan OTIC," a testing and certification center that complies with the O-RAN Alliance standards, was established in Yokosuka Telecom Research Park in December 2022 by several domestic telecommunications carriers and other companies interested in promoting the Open RAN ecosystem in Japan with a view to overseas deployment. Its first certification was issued in June 2023, and a variety of workshops are held regularly to promote the use of Japan OTIC.

Since FY2024, MIC has also been conducting technical tests on an interoperability verification environment that can simulate the networks of multiple telecommunications carriers in Japan and overseas.

6. Improving radio environments

(1) Pursuing bioelectromagnetic environmental measures

MIC is promoting the development of safe and secure environments for the use of radio waves.

More concretely, MIC has formulated "Radio Wave Protection Guidelines"⁶ to prevent radio waves from having undesirable effects on human health, and has stipulated part of the Guidelines as safety standards on the strength of radio waves. These reflect the results⁷ of many years of research on radio safety. They also ensure equivalence with international guidelines. No causal relationship between radio waves at levels below these safety standards and adverse health effects has been confirmed in previous investigations and studies. MIC continues to educate the public about radio wave safety by providing telephone consultations, holding information meetings, and distributing leaflets⁸.

The "Research Survey on the Impact of Radio Waves on Medical Devices, etc."⁹ is conducted annually, and

the findings obtained from the surveys to date have been compiled as "Guidelines for Safeguarding Implantable Medical Devices, etc., from the Impact of Radio Waves from Radio Wave-emitting Devices"¹⁰. As the use of radio waves at medical institutions continues to grow, MIC is also working to inform medical professionals and others of necessary precautions and radio wave management practices for medical telemetry, mobile phones, wireless LAN, etc., by delivering briefings on demand to ensure safe and secure radio wave use. As a related initiative, MIC has been engaged in a radio shield countermeasure project for medical facilities since FY2017, making use of a subsidy provided to help cover the expenses for projects supporting the dissemination of radio systems in order to create environments in which mobile phones can be used safely and securely within medical facilities.

(2) Implementing electromagnetic interference countermeasures

The widespread use of electrical and electronic devices has made it important to take measures to protect radio use from unwanted radio waves emitted from various devices and equipment. Accordingly, the "Radio Use

Environment Committee"¹¹ established under the Information and Communications Council's Information and Communications Technology Subcommittee conducts research and studies on electromagnetic interference

⁶ Radio Radiation Protection Guidelines <https://www.tele.soumu.go.jp/j/sys/ele/medical/protect/>

⁷ Research on Radio Safety at MIC: <https://www.tele.soumu.go.jp/j/sys/ele/seitai/index.htm>

⁸ Radio Safety Initiatives: <https://www.tele.soumu.go.jp/j/sys/ele/index.htm>

⁹ Research on the effects of radio waves on medical devices: <https://www.tele.soumu.go.jp/j/sys/ele/seitai/chis/index.htm>

¹⁰ Guidelines for Safeguarding Implantable Medical Devices, etc., from the Impact of Radio Waves from Radio Wave-emitting Devices: <https://www.tele.soumu.go.jp/resource/j/ele/medical/guide.pdf>

¹¹ Radio Use Environment Committee: https://www.soumu.go.jp/main_sosiki/joho_tsusin/policyreports/joho_tsusin/denpa_kankyou/index.html

countermeasures and contributes to deliberations on international standards by the Comité International Spécial des Perturbations des Radiélectriques (CISPR). In response to reports from the Information and Communications Council, MIC is working to eliminate interference to radio equipment and prevent interference to electrical and electronic equipment caused by unwanted radio waves by pursuing standardization in Japan.

International standards for the wireless power transmission systems used in electric vehicles (EVs), multimedia devices, and home appliances are now being given full consideration and, as part of its international activities with respect to CISPR, Japan has been taking the lead in vigorously studying technologies to prevent the leakage of radio waves emitted from wireless power transmission systems used in electric vehicles from interfering with existing radio stations.

(3) Preventing radio interference and jamming

To eliminate interference and maintain a favorable environment for the use of radio waves amid the expanded adoption of fifth-generation (5G) mobile phones and other new radio wave applications, MIC is monitoring radio waves to eliminate interference and taking stronger steps against radio equipment that does not conform to technical standards (non-compliant equipment) that could be the cause of such interference.

More specifically, MIC's efforts include trial purchase test of radio equipment⁹ in which MIC purchases radio equipment that is widely available on the market through online shopping and other means, measuring whether the equipment's radio wave strength complies with the standards for "extremely low-power radio equipment"¹² as stipulated in the Radio Act, and publishes the results annually as information to protect general consumers, all for the sake

Robots have been introduced in factories and distribution centers in recent years, and wireless power transmission systems are expected to be installed as a means of supplying power to these robots. The Radio Use Environment Committee has verified shared use with other radio equipment and conformity to the Radio Radiation Protection Guidelines, etc., and examined technical conditions such as the allowable values and measurement methods for leaked radio waves emitted from wireless power transmission systems. Based on these examinations, MIC issued a partial report in June 2024 on the technical conditions for field-coupling wireless power transmission systems using 6.7 MHz-band frequencies within the context of the technical conditions for wireless power transmission systems, and institutional improvements were made by revising the Regulations for the Enforcement of the Radio Act in December 2024.

of keeping them from violating the Radio Act by purchasing and using equipment that does not conform to the established standards (illegal establishment of radio stations) or causing interference with the operation of other radio stations.

MIC requests dealers of radio equipment determined through a trial purchase test not to be compliant with the standards for extremely low-power radio equipment to ensure that they only handle radio equipment that conforms to the technical standards and refrain from selling non-compliant equipment. Additionally, MIC formulated the "Guidelines for preventing the distribution of wireless devices that do not conform with technical regulations" in FY2020 to control the distribution of non-standard equipment by clarifying the obligations of manufacturers, importers, and distributors of radio equipment and the voluntary efforts of Internet shopping mall operators.

¹² Extremely low-power wireless devices: <https://www.tele.soumu.go.jp/j/ref/material/rule/>

⁹ Implemented since FY2013 Results of wireless equipment trial purchase tests: <https://www.tele.soumu.go.jp/j/adm/monitoring/illegal/result/>

Section 4 Developments in broadcasting policy

1. Summary

(1) Past initiatives

Broadcasting, a foundation of democracy, has served as social capital for sharing basic social knowledge such as disaster and community information.

Television broadcasting, previously only available in analog form, was fully digitalized at the end of March 2012, and further advances in broadcasting services such as high-definition video images and data broadcasting have since been made. In the interest of promoting 4K/8K broadcasting services with higher resolution and image quality than HDTV, MIC has teamed up with broadcasters, manufacturers, etc., to disseminate information and raise awareness of how to access 4K/8K satellite broadcasting and 4K/8K content, as well as to certify 4K broadcasting operators and make other efforts needed to ensure that as many people in Japan as possible can enjoy the dynamic and powerful images available with 4K and 8K broadcasting.

Applying the lessons learned from January 2024 earthquake in the Noto region of Ishikawa Prefecture in January 2024 and the September 2024 torrential rainfall on the Noto Peninsula to ensure that the public receives necessary disaster and evacuation information, MIC has

been engaged in efforts aimed at helping make broadcast networks more robust and disaster-resistant, including projects to restore transmission station facilities for terrestrial key broadcasting damaged in serious disasters, as well as implementing seismic countermeasures. Furthermore, MIC has been promoting the spread of broadcasting for persons with visual and hearing impairments by, for instance, providing subsidies to broadcasters for the production of subtitled programs, commentary programs, sign language programs, etc., and for the maintenance of equipment to provide subtitles for live broadcast programs, and formulating “Guidelines for Information Accessibility in the Broadcasting Field” that set targets for the dissemination of subtitled broadcasts, etc., to achieve equal-opportunity access to information through broadcasting.

In addition, it is important to have “receivers” as well as “transmitters” of broadcast programs, so MIC is working to improve literacy in broadcast media, especially for elementary, junior high, and high school students, and is providing educational materials and classroom practice packages for teachers.

(2) Future issues and directions

The environment surrounding broadcasting is changing dramatically, as viewers’ viewing styles change and they increasingly move away from television with the spread of broadband, the growth of Internet video distribution services, and the diversification of viewing devices. Viewers increasingly obtain information not only from broadcasts but also from the Internet, and advertising expenditures for terrestrial television broadcasting may continue to decline in the long term, forcing structural changes. On the other hand, problems involving dis-/mis-information have emerged in the Internet space, and ensuring the soundness of information spaces has become an issue. Broadcasting plays a role in dis-

seminating reliable information, fulfilling people’s right to know, sharing basic social information, and promoting mutual understanding of diverse values, so it is precisely in this digital age that expectations of its role are on the rise.

In responding to these changing circumstances, it is necessary to envision the future of broadcasting and broadcasting systems from a medium- to long-term perspective, and to address such issues as reinforcing the foundations of the broadcasting business, promoting the distribution of broadcasting content, and enhancing the robustness and disaster resistance of broadcast networks.

2. Examining the state of broadcasting systems in the digital age

MIC has been convening the “Study Group on the Broadcasting System in the Digital Age” (hereinafter referred to as the “Broadcasting System Study Group”) since November 2021 in order to examine the future vision of broadcasting and the ideal state of broadcasting systems from a medium- to long-term perspective amidst the rapid advancement of digitization across society.

The Broadcasting System Study Group published the “Report on the Future Vision and Ideal System of Broadcasting in the Digital Age” (hereinafter, the “First Report”) in August 2022¹, and the “Second Report on the Future Vision and Ideal Systems of Broadcasting in the Digital Age” (hereinafter, the “Second Report”) in October 2023². Based on the First Report, MIC has re-

¹ “Report on the Future Vision and Ideal System of Broadcasting in the Digital Age” (August 5, 2022): https://www.soumu.go.jp/menu_news/s-news/01ryutsu07_02000236.html

² “Second Report on the Future Vision and Ideal System of Broadcasting in the Digital Age” (October 18, 2023): https://www.soumu.go.jp/menu_news/s-news/01ryutsu07_02000269.html

vised ministerial ordinances³ to relax the principle of excluding concentration of mass media ownership⁴, and also enacted partial amendments to the Revised Act⁵, which include measures such as enabling multiple specified basic terrestrial broadcasters to jointly use relay station equipment in a single broadcasting region.

To improve the management efficiency of specified key terrestrial broadcasting service providers, a national council on the joint use of relay station equipment was established in December 2023 and regional councils were set up throughout Japan by May 2024 to consider three matters: creating a roadmap for joint use, defining the roles of related parties, and formulating/implementing regional plans for upgrading relay stations. In December 2024, Japan Broadcast Network (hereinafter, “JBN”), a joint use preparatory company, was established with investment from NHK. JBN is studying business plans and other measures to realize the joint use of terrestrial relay stations.

The “Working Group on Public Broadcasting” was convened under the Broadcasting System Study Group to study NHK’s approaches to Internet streaming, etc., and, following the two reports⁶ released in October 2023 and February 2024, the “Act for Partial Amendment of the Broadcasting Act” (Act No. 36 of 2024) enacted in May 2024 (hereinafter, the “Revised Broadcasting Act”) stipulated that the streaming of broadcast programs via the Internet is an essential part of NHK’s business. Under the Revised Broadcasting Act, NHK is required to establish its own operational rules to distribute program-related information⁷ via the Internet at its own discretion and responsibility, while MIC is required to hear the opinions of academic experts and interested parties on these rules and to confirm that the rules are in conformity with the requirements set out to ensure fair competition⁸.

The Broadcasting System Study Group subsequently published the “Third Report on the Future Vision and Ideal System of Broadcasting in the Digital Age” (hereinafter,

the “Third Report”) in December 2024. The Third Report summarizes the results of studies on the future of broadcasting, systems for replacing small relay stations, etc., with broadband or other measures (cable TV, streaming services, etc.), and management options for radio broadcasting, as well as the findings of specialized studies on (1) the feasibility of replacing small relay stations with broadband, (2) the future of NHK’s international broadcasting, (3) measures necessary to promote the production and distribution of broadcasting content, and (4) the reduction of infrastructure costs for satellite broadcasting⁹.

Based on the Third Report, MIC submitted to the 217th (regular) session of the Diet in 2025 the “Act for Partial Amendment of the Radio Act and the Broadcasting Act” that would oblige key terrestrial broadcasting service providers to take steps to ensure that their broadcast programs can continue to be viewed through cable TV or distribution services if relay stations are inevitably abolished, and this bill was passed into law in April 2025 (Act No. 27 of 2025).

Disasters in Japan have also become more severe and frequent in recent years, and there are concerns about potential large-scale disasters in the near future, including Nankai Trough earthquakes and other wide-area large-scale disasters such as Japan Trench and Chishima Trench earthquakes, as evidenced by the issuance of the first “Nankai Trough Earthquake Extra Information (Megathrust earthquake attention)” in August 2024. Given these circumstances, a new “Review Team to Enhance and Strengthen Measures to Maintain and Secure Broadcasting Services in the Event of a Large-Scale Disaster” was established in February 2025 under the Broadcasting System Study Group to intensively study ways of enhancing and strengthening measures above and beyond existing approaches to maintain and secure broadcasting services in anticipation of future wide-area large-scale disasters with the cooperation of relevant service providers.

3. Reinforcing the foundations of the broadcasting business

(1) AM radio broadcasting initiatives

Many of the AM transmission facilities used by commercial AM radio broadcasters are more than 50 years old and are seriously aging. Commercial AM radio broadcasters have thus been burdened with the cost of both AM and FM equipment because of the start of com-

plementary FM broadcasting introduced to eliminate poor AM radio reception, and they have seen their business income decline, making the cost of updating AM radio broadcasting equipment a significant management issue.

³ Ministerial Ordinance Partially Amending the Ministerial Ordinance Concerning Definitions of Specified Executives and Relationships of Control in Key Broadcasting Services and Special Provisions on the Standards for Enjoying Freedom of Expression (Ministerial Ordinance No. 13 of 2023)

⁴ The guidelines are designed to ensure that freedom of expression through broadcasting is enjoyed by as many people as possible by ensuring that as many people as possible have the opportunity to broadcast, and that the number of key broadcasting stations owned or controlled by any single person is limited.

⁵ The Act to Partially Amend the Broadcasting Act and Radio Act (Act No. 40 of 2023)

⁶ Summary of Working Group on Public Broadcasting (October 18, 2023): https://www.soumu.go.jp/main_content/000907572.pdf Second Summary of Working Group on Public Broadcasting (February 28, 2024): https://www.soumu.go.jp/main_content/000931107.pdf

⁷ Information on content closely related to the content of a broadcast program broadcast or to be broadcast by NHK, comprising materials necessary for editing the said broadcast program (including edited versions of the said broadcast program, excluding the said broadcast program)

⁸ In November 2024, MIC convened the “Panel on Competitive Assessment of NHK’s Program-related Information Distribution Operations” to hear opinions from academic experts and interested parties on whether NHK’s operational rules conform to the provisions of the revised Broadcasting Act, and no participants found the content of NHK’s operational rules non-compliant with the revised Broadcasting Act. “Opinions on NHK’s Operational Rules” (December 18, 2024): https://www.soumu.go.jp/main_content/000982600.pdf

⁹ “Third Report on the Future Vision and Ideal System of Broadcasting in the Digital Age” (December 13, 2024): https://www.soumu.go.jp/menu_news/s-news/01ryutsu07_02000296.html

Given these severe business conditions, MIC has decided to put in place special measures allowing AM stations to suspend operations for a period of six months or longer in order to examine the impact on commercial AM radio broadcasters of making the business decision to switch from AM broadcasting to FM broadcasting (switching to FM) or to discontinue AM broadcasting relay stations without switching to FM, and the details, requirements and procedures for such measures are outlined in the “Basic Policy on Special Measures Concerning AM Station Suspension (published in March

2023, revised in December 2024). These special measures based on this Basic Policy were applied to some AM stations when broadcasters were simultaneously re-licensed in November 2023, and these stations have been gradually suspending their operations since February 2024. Another round of special measures will be applied to stations other than these from December 2025 onward to allow them to suspend operations as well. MIC plans to study the necessary institutional arrangements based on the outcomes of these operational suspensions.

(2) Addressing issues in satellite broadcasting

A Study on the future of sustainable satellite broadcasting

Based on the Second Report published in October 2023, MIC convened a “Satellite Broadcasting Working Group” under the Broadcasting System Study Group from November 2023 to September 2024 to resolve satellite broadcasting issues arising in the changing environment surrounding satellite broadcasting and to draw up a vision of the future for sustainable satellite broadcasting, and this Working Group issued a report in December 2024.

The Satellite Broadcasting Working Group has engaged in concrete and specialized discussions on reducing infrastructure costs for satellite broadcasting, utilizing satellite broadcasting as a terrestrial replacement, making effective use of the right-handed circularly po-

larized band, handling of infomercials in the certification of basic satellite broadcasting, and utilizing satellite broadcasting during disasters. MIC has responded by taking actions based on the results and recommendations emerging from the Satellite Broadcasting Working Group’s discussions, e.g., examining technical issues and the willingness of viewers to accept extra costs burden for the use of satellite broadcasting as a terrestrial replacement in February 2025, and establishing a system that provides the option to use the HEVC format with high compression efficiency for 2K broadcasting to make effective use of the right-handed circularly polarized band in March 2025.

B Efforts to promote 4K8K satellite broadcasting

4K8K satellite broadcasting, which began in December 2018 for BS and 110° East longitude CS broadcasting, is steadily making headway, with cumulative shipments of receivers and other equipment capable of viewing 4K8K satellite broadcasting exceeding 20 million units as of July 2024 (approximately 22.5 million units had been shipped by the end of March 2025).

MIC is working with broadcasters, manufacturers, and related organizations to highlight the appeal of ultra-

high definition images, a feature of 4K8K satellite broadcasting, and to promote the development of reception environments to facilitate the spread of 4K8K satellite broadcasting.

4K broadcasting in the right-handed circularly polarized band for BS broadcasting, which was approved by MIC in November 2023, began in April 2025, and MIC remains committed to promoting 4K broadcasting.

4. Promoting broadcast content production and distribution

(1) Efforts to effectively distribute broadcast content, etc., online

The Broadcasting System Study Group First Report noted the importance of reducing the equipment burden on local stations and other broadcasters and of creating an environment in which they can focus on content production.

From the perspective of creating such an environment, it is crucial to promote the production of content by broadcasters as well as greater distribution of such content on the airwaves and on the Internet so that it can be widely viewed. In Particular, Local broadcasters are expected to play a major role in disseminating regional information in the future.

Enabling broadcasting to continue fulfilling its role as social infrastructure amid changes in the environment surrounding broadcasting, such as the growth of Internet video distribution services and the diversification of viewing styles, will necessitate promoting the utilization

of various Internet platforms and not just broadcasting waves so that Japan’s broadcasting content can be widely distributed both domestically and internationally.

From this perspective, the “Working Group on the Promotion of Broadcasting Content Production and Distribution” was convened in cooperation with relevant businesses and other parties in December 2022 under the Broadcasting System Study Group to discuss ways of encouraging the production and distribution of broadcasting content in the Internet age.

The Second Report released in December 2024 recommended that closer public-private partnership initiatives be pursued via demonstrations and other means to bring about environments where viewers can easily view broadcast content via the Internet as soon as possible while paying due attention to a balance between novelty and diversity for viewers, the presentation of content

that matches viewers' tastes and preferences, and the creation of environments where local viewers can easily view content from local stations, with the aim of establishing a virtual platform that ensures a full lineup of

broadcast content from NHK and commercial broadcasters on Internet-connected TV receivers (e.g., connected TVs) to improve viewer convenience.

(2) Utilizing viewing data and ensuring privacy protection in broadcasting

The viewing histories of broadcast programs collected from TV receivers connected to the Internet for analysis can be effectively used, for example, to produce programs tailored to the specific viewing needs of viewers in different locales and to provide disaster information, but it is also technically possible to infer sensitive personal information such as the political beliefs and medical histories of individual viewers.

In March 2022, MIC established the “Guidelines for

the Protection of Personal Information of Broadcasting Viewers”, applicable to all parties handling the personal information of broadcast viewers, etc., in light of the public nature of broadcasting, and has since made a series of revisions. MIC will continue striving to both improve the benefits to broadcast viewers through the use of viewing data and other information and to protect their privacy.

(3) Facilitating rights handling in the simultaneous distribution of broadcast programs, etc.

In light of changes in viewing environments due to the popularity of smart devices and other factors, broadcasters are pursuing initiatives such as simultaneous distribution of broadcast programs on the Internet (including simultaneous streaming, chasing streaming, and catch-up streaming; the same applies hereinafter). This is an important initiative from the viewpoints of improving viewer convenience, promoting the content industry, and ensuring international competitiveness, as it expands opportunities to view high-quality content. On the other hand, a large number and variety of copyrighted works are used in broadcast programs, and issues related to rights handling such as masking might arise due to the inability to handle copyrights and other rights in the case of simultaneous distribution, etc. In pursuing simultaneous transmission, etc., it was thus necessary to create environments that would allow copyrighted works to be used more quickly and smoothly.

MIC, together with the Agency for Cultural Affairs,

which has jurisdiction over the Copyright Act (Act No. 48 of 1970), solicited opinions from relevant parties and studied possible system revisions that would facilitate rights handling with regard to simultaneous distribution, etc. Consequently, the “Act for Partial Amendment of the Copyright Act” (Act No. 52 of 2021) was passed in the 204th (regular) Diet session in 2021 and facilitation measures were implemented. MIC has been closely monitoring developments pertaining to rights handling and is studying ways of further facilitating simultaneous transmission, which is now entering full-scale implementation with all five commercial broadcasters having adopted simultaneous transmission in April 2022 after the revisions came into effect. Since local broadcasters lack the personnel and know-how to carry out the administrative tasks involved in rights handling, verification is being conducted to establish a system that will help make rights handling more efficient.

(4) Engaging in appropriate production transactions for broadcast content

MIC has since FY2018 convened the “Study Group on Verification and Review on Promotion of Production and Trade of Broadcast Content” consisting of experts and others in order to improve the production environment for broadcasting content and to boost the motivation to produce content. Based on the Panel's discussions, a series of revisions were made to the “Guidelines for Regulation on Production and Trade of Broadcast Content” (formulated in February 2009; hereinafter, the “Guidelines”) and efforts have been made to encourage broadcasters and program production companies to undertake proper production transactions for broadcasting content.

Specifically, MIC strives to gain an accurate picture of circumstances by conducting periodic questionnaire surveys to ascertain the status of production transactions of broadcast content as well as interviews with

broadcasters and program production companies to ascertain their compliance with the Guidelines, provides guidance, if any issues are found, under Article 4 of the Act on the Promotion of Subcontracting Small and Medium-sized Enterprises (Act No. 145 of 1970), and holds seminars to raise awareness of the Guidelines; MIC has also set up a “Legal Consultation Hotline for Transaction of Produced Broadcast Content” to provide free consultation with attorneys on specific issues related to production transactions.

The Panel has been discussing the ownership of copyrights, appropriate production costs, and working conditions at program production sites since FY2023, and a revised version of the Guidelines (8th edition) was published in October 2024 based on the results of these discussions.

(5) Expanding broadcast content overseas

With the growth of video distribution services, producing content for overseas broadcasting and distribution and actively pursuing overseas expansion are neces-

sary steps to ensure the competitiveness of Japanese broadcast content and to capture shares in expanding markets.

The overseas dissemination of content is also extremely important from a diplomatic perspective, as it will likely convey Japan's attractiveness to the rest of the world, increase interest in Japan's natural beauty and culture, and help enhance Japan's image.

To this end, MIC will continue supporting the overseas expansion of broadcast content by effectively disseminating information at international content trade fairs held in Japan and elsewhere (TIFFCOM (Japan),

ATF (Singapore), MIPCOM (France), etc.) through seminars organized via public-private collaboration. From FY2025, MIC will newly support the production of live-action content using advanced equipment, etc., and human resource development, as well as working toward the overseas dissemination of Japanese content in cooperation with domestic distribution companies, taking into account the viewing environment changes that have taken place vis-a-vis streaming.

(6) Ensuring the competitiveness of the broadcasting and streaming content industry

The global content market is expected to grow further in the future, and Japan has positioned the content industry as a key industry and is making strategic efforts in this area.

In particular, Broadcast content is vulnerable to changes in the external environment and in profit structures, and it is essential that the broadcast content industry be competitive for it to achieve sustainable development.

A new "Broadcast and Streaming Content Industry Strategy Review Team" was therefore organized in March 2025 under the Broadcasting System Study Group to work with relevant businesses in intensively studying issues and measures to further promote the broadcast content industry, the most suitable approaches to public-private partnerships, the current status of streaming content markets, and future measures for promoting streaming content.

5. Promoting broadcasting for people with audiovisual disabilities

MIC has formulated "Guidelines for Information Accessibility in Broadcasting" (first published in February 2018, revised in October 2023) to set dissemination targets for subtitled programs, commentary programs, and sign language programs in order to enable people with audiovisual disabilities to access information smoothly through television broadcasting, and MIC facilitates voluntary efforts by broadcasters in this regard.

In accordance with the "Act on Advancement of Facilitation Program for Disabled Persons' Use of Telecom-

munications and Broadcasting Services, with a View to Enhance Convenience of Disabled Persons" (Act No. 54 of 1993), subsidies are provided for the production costs of subtitled programs, commentary programs, sign language programs, etc. Since subtitling live broadcast programs requires considerable manpower and costs as well as personnel with special skills, subsidies have also been provided since FY2020 for the cost of the equipment needed to subtitle live broadcast programs, including systems that utilize cutting-edge ICT.

6. Enhancing the robustness and disaster resilience of broadcasting networks

(1) Strengthening the disaster resilience of cable networks

MIC has been carrying out the "Project to Strengthen the Disaster Resilience of Cable Television Networks" under the FY2024 supplementary budget and the FY2025 initial budget to support efforts aimed at making cable television networks more resilient to disasters, including conversions to optical fiber lines and the installation of multiple lines, as well as supporting disaster recovery efforts for cable television facilities damaged by the January 2024 earthquake in the Noto region of Ishikawa Prefecture, in order to ensure that information can be transmitted reliably and stably in the event of a disaster (**Figure 2-2-4-1**). Starting with the FY2024

supplementary budget, the requirements to qualify as a disadvantaged area have been relaxed and the fiscal capacity index requirement eliminated, and measures have been taken to support projects limited to the installation of emergency power supply facilities.

Assistance is also being offered to upgrade and replace aging shared antenna facilities in remote areas, etc., through the "Project to Replace Small Relay Stations for Basic Terrestrial Broadcasting with Broadband, etc." in the initial budget for FY2025 (**Figure 2-2-4-2**).

Figure 2-2-4-1 Cable Television Network Disaster Resilience Enhancement Project

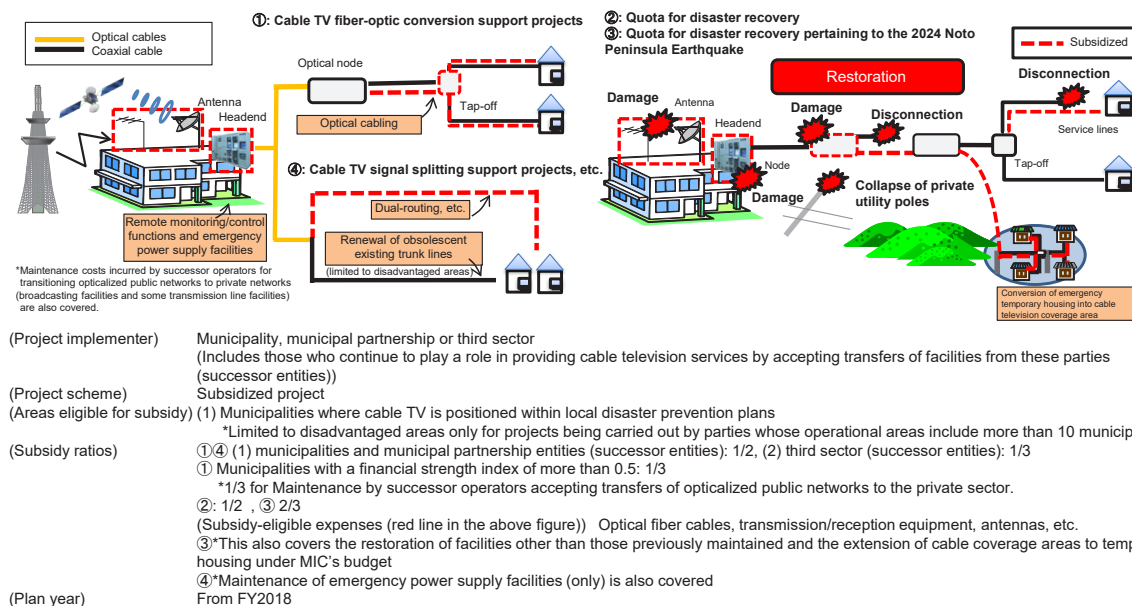


Figure 2-2-4-2 Project to Support Broadband Substitution of Small Relay Stations for Basic Terrestrial Broadcasting

Project Image

○ Project implementer

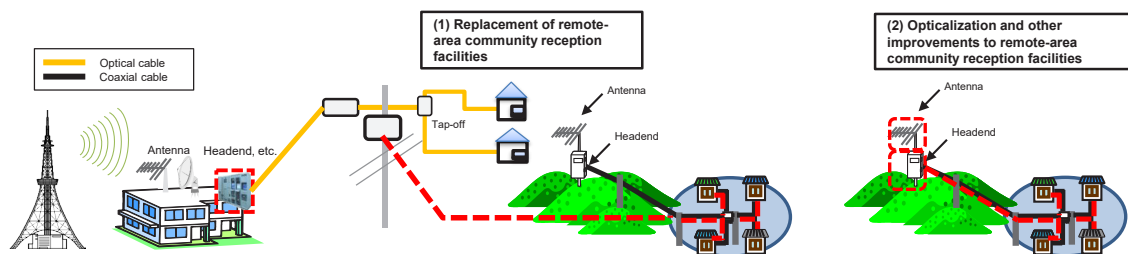
- (1) Municipalities, municipal partnerships, broadcasters, telecommunications providers, and broadcaster/telecommunications provider partnerships
- (2) Municipalities and municipal partnerships

○ Subsidy ratios

- (1) Replacement of remote-area community reception facilities : 2/3
- (2) Opticalization and other improvements to remote-area community reception facilities: 1/2

○ Expenses to be subsidized (red dotted line in the figure below)

Optical fiber cables, transmission/reception equipment, antennas, etc.
 *Limited to areas where relay stations have not been discontinued
 *Includes transmission line facilities, etc., necessary for replacement by cable TV (including that using IP multicast systems) as part of the opticalization of remote-area community reception facilities (coaxial cables).
 *For replacements, the cost of removing existing facilities is included.



(2) Supporting efforts by broadcasters, etc.

MIC is supporting efforts by broadcasters, local governments, etc. to make broadcasting networks more robust through the “Support Project for Improving Broadcasting Networks (Project for Improving Basic Terrestrial Broadcasting Networks)”, the “Support Proj-

ect for Eliminating Poor Commercial Radio Reception”, and the “Support Project for Strengthening the Disaster Resilience of Basic Terrestrial Broadcasting, etc.” (**Figure 2-2-4-3**) under the FY2024 supplementary budget and the FY2025 initial budget.

Figure 2-2-4-3 Project for Improving Basic Terrestrial Broadcasting Networks, Support Project for Eliminating Poor Commercial Radio Reception, and Support Project for Strengthening the Disaster Resilience of Basic Terrestrial Broadcast, etc.

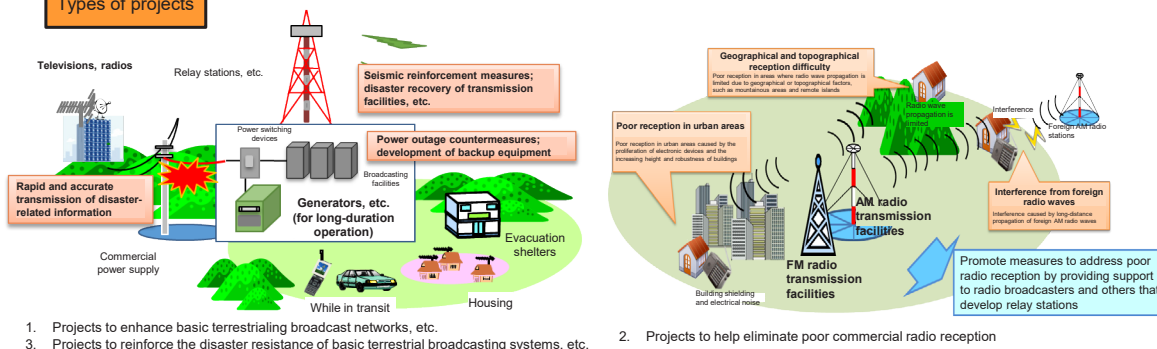
- To reliably provide disaster, evacuation and other information essential for securing citizens' lives and property, broadcast networks as important means of transmitting information in the event of a disaster will be made more robust and more disaster-resistant.

Subsidy ratios

- Projects to enhance basic terrestrial broadcasting networks, etc.
 - Local governments: 1/2
 - Basic terrestrial broadcasters, etc., third sector: 1/3
- Projects to help eliminate poor commercial radio reception
 - Poor reception due to geography/terrain, foreign broadcast interference: 2/3
 - Poor reception in urban areas: 1/2
- Projects to reinforce the disaster resistance of basic terrestrial broadcasting systems, etc.
 - Local governments, etc.: 1/2
 - Basic terrestrial broadcasters, etc.: 1/3

*Municipalities in disadvantaged areas with financial strength index figures of 0.5 or less implementing projects relating to relay stations as measures against poor reception: 2/3

Types of projects



Section 5 Developments in cybersecurity

1. Summary

(1) Past initiatives

In 2015, the Cybersecurity Strategic Headquarters was established under the Cabinet in accordance with The Basic Act on Cybersecurity (Act No. 104 of 2014), enacted against a background of rising cybersecurity threats becoming more serious on a global scale, setting forth the basic principles, etc., of Japan's cybersecurity policy. Since then, cybersecurity policies have been pursued in line with the "Cybersecurity Strategy"¹ approved by the Cabinet in September 2021, taking into account socioeconomic changes as well as increasing cybersecurity threats,

The "Cybersecurity Action Plan for Critical Infrastructure"² (approved by the Cybersecurity Strategic Headquarters in June 2022 and revised by the Headquarters in March 2024), which defines the basic framework for the protection of critical infrastructure, designates the information and telecommunications sector (telecommunications, broadcasting, and cable TV) as one of 15 areas of critical infrastructure that could have a significant impact on people's lives and socioeconomic activities if their functions were suspended or made unavailable. As the ministry responsible for critical infrastructure, MIC must continue its efforts to ensure the safety and reliability of information and telecommunications networks.

Furthermore, the Cabinet Secretariat convened an expert panel in June 2024 to discuss the legislation necessary to undertake new cybersecurity initiatives in order to improve response capabilities in the cybersecurity field to a level on par with major Western countries or

better and thereby ensure the safety of the nation and critical infrastructure, etc., in keeping with the National Security Strategy approved by the Cabinet in December 2022. In November 2024, a "Proposal for Enhancing Response Capabilities in the Field of Cybersecurity" was compiled and, on this basis, "the Act on the Prevention of Damage from Unauthorized Acts Against Critical Computers" and "the Act Concerning Development of Laws Related to Enforcement of the Act on the Prevention of Damage from Unauthorized Acts Against Critical Computers" were both submitted to the 217th (regular) Diet session in 2025 and approved and passed in May 2025 after amendment, leading to the progress being made by the government in pursuing cybersecurity initiatives.

MIC has convened a Cybersecurity Task Force consisting of experts in the security field since 2017, and the Task Force has repeatedly compiled issues and measures to be addressed by MIC in light of changing circumstances, the Tokyo Olympic and Paralympic Games, the COVID-19 pandemic, etc. More recently, the ICT Cybersecurity Policy Subcommittee formed in February 2024 met to study the direction of cybersecurity policies that MIC should adopt over the medium to long term in light of the rapid spread of new technologies and services such as generative AI and the trends toward diversification and complexity in supply chains, and published its "Key Medium-term Strategies for ICT Cybersecurity Policy" in July 2024.

(2) Future issues and directions

The cybersecurity situation facing Japan is becoming more complex and sophisticated with each passing year. There have been ransomware attacks targeting the data centers of major businesses that disrupted their operations, and cases of persons without technical knowledge creating ransomware by using generative AI. The rising number of IoT devices stemming from rapid digitalization as well as the diversification of supply chains continue to expand the range of targets subject to attack, while accelerating changes in international relations are making the security situation more severe.

As cyberattacks become more complex and intricate, the security risks surrounding cyberspace are becoming

more serious, since the targets of such attacks can include critical infrastructure, etc., that significantly impacts citizens' lives and economic activities.

With cyberspace transforming into a public space, it is becoming increasingly important to recognize the changing circumstances and ensure cybersecurity so that each and every citizen can use the information and communication technologies (ICT) forming the foundation of cyberspace with peace of mind.

Accordingly, MIC, in cooperation with relevant organizations and the private sector, will take the lead in Japan's cybersecurity policy, thereby helping ensure safety and security in cyberspace.

2. Cybersecurity in critical infrastructure, etc.

(1) Implementing comprehensive IoT botnet countermeasures

In seeking to ensure the safety and reliability of information and telecommunications networks that support cyberspace, the impact of large-scale cyberattacks such

as DDoS attacks that could disrupt the functioning of information and telecommunications networks is of major concern. Typical DDoS attacks comprise two phases:

¹ Cybersecurity Strategy: <https://www.nisc.go.jp/active/kihon/pdf/cs-senryaku2021.pdf>

² Cybersecurity Action Plan for Critical Infrastructure: https://www.nisc.go.jp/pdf/policy/infra/cip_policy_2024.pdf

(1) infecting a large number of IoT devices with malware and bringing them under the attacker's control (expansion of attack infrastructure), and (2) using this attack infrastructure to carry out attacks through the network. In fact, as the number of IoT devices increases and their functions improve, the number and scale of cyberattacks that exploit IoT devices are also on the rise. NICTER, the cyberattack observation networks operated by NICT, showed in 2024 that cyberattack-related communications still targeted IoT devices most frequently.

Responding to such large-scale cyberattacks requires comprehensive countermeasures against IoT botnets, including both terminal-side (IoT device) countermeasures to prevent the expansion of the attack infrastructure and network-side countermeasures to deal with the command and control (C&C) servers that issue commands to the attack infrastructure.

MIC has been working with NICT and Internet service providers (ISPs) to investigate online IoT devices with easily guessable passwords such as “password” and “123456” and to alert users of such devices – with these terminal-side countermeasures showing some success – as part of “NOTICE (National Operation Towards IoT Clean Environment)”.

However, the risk of cyberattacks exploiting IoT devices remains high, as seen in the recent increase in cyberattacks targeting software vulnerabilities in IoT devices, so cyberattacks exploiting IoT devices remain an issue. Accordingly, responsibility for investigating IoT

devices with software vulnerabilities or terminals already infected with malware as well as offering advice to device users and IoT device manufacturers was newly assigned to NICT as of FY2024 in addition to its existing tasks.

Furthermore, MIC will be implementing comprehensive countermeasures, in addition to previous notices provided to IoT device administrators, and these will include promoting security measures for IoT devices in cooperation with manufacturers and system vendors and raising awareness of security measures for IoT devices through video distribution and online advertising.

As a network-side measure, MIC began in FY2022 verifying the effectiveness of technology that allows telecommunications carriers to analyze flow information (IP addresses, port numbers, time stamps, etc.) related to communications traffic to detect C&C servers that are the source of cyberattack commands, and examining approaches to sharing and utilizing the detected C&C server list among carriers. MIC's efforts to date have confirmed the effectiveness of flow information analysis, including the successful detection of a number of C&C servers, and the goal from FY2025 will be to shrink the number of IoT botnets by visualizing overall structure of IoT botnets and implementing effective countermeasures tailored to the characteristics of each botnet, all the while coordinating these efforts with terminal-side countermeasures.

(2) Encouraging proactive cybersecurity measures by telecommunications carriers

To make security measures for IoT devices more effective, developing an environment that provides more agile measures on the network side through which communication traffic passes is considered a necessary complement to the comprehensive IoT botnet countermeasures mentioned above.³

A comprehensive demonstration of cybersecurity measures was conducted from FY2021 to enable telecommunications carriers to more efficiently and proactively deal with cyberattacks that are becoming larger, more sophisticated, and more complex. In the “Demonstration of Techniques for Detecting and Sharing Phishing Websites and Other Malicious Websites”, a reference on practical phishing countermeasures was prepared for web service providers and awareness-raising activities were conducted for the general public; a reference outline was released in May 2024. In the

“Demonstration of the Introduction of Network Security Countermeasure Techniques”, a draft guideline for the introduction and operation of network security technologies such as RPKI⁴, DNSSEC⁵, and DMARC⁶ was prepared using knowledge obtained through technical demonstrations of these technologies, which are not widely used in Japan despite the fact that their employment is becoming standard internationally. Based on this draft guideline, the Japan Network Information Center published the “Guidelines for Countermeasures against Unauthorized Internet Pathways Using RPKI ROA”⁷ and the Japan Data Communications Association published “Guidelines for the Introduction of DMARC Transmission Domain Authentication Technology”⁸ in FY2024. MIC continues in FY2025 to promote efforts to spread the use of these technologies.

³ The “ICT Cybersecurity Comprehensive Countermeasures 2021” formulated in 2021 stipulate the need to consider means of developing advanced and flexible countermeasures for information and telecommunications networks managed by ISPs on the Internet as part of the efforts by telecommunications carriers to devise proactive countermeasures against cyberattacks.
https://www.soumu.go.jp/menu_news/s-news/02cyber01_04000001_00192.html

⁴ RPKI (Resource Public-Key Infrastructure): A technology to verify the IP addresses and AS numbers of autonomous networks with digital certificates to prevent the hijacking of communication routes, etc.

⁵ DNSSEC (DNS Security Extensions): A technology that prevents server spoofing by verifying the linkage between domain names and IP addresses with digital certificates

⁶ DMARC (Domain-based Message Authentication Reporting and Conformance): A technology that verifies the authenticity of the domain from which an e-mail is sent and automatically handles instances of spoofing, etc.

⁷ Guidelines for Countermeasures against Unauthorized Internet Pathways Using RPKI ROA
<https://www.nic.ad.jp/doc/jpnic-01324.html>

⁸ Guidelines for the Introduction of DMARC Transmission Domain Authentication Technology
https://www.dekyo.or.jp/soudan/data/anti_spam/dmarc_guideline.pdf

(3) Initiatives involving supply chain risk countermeasures

MIC conducted technical verification over the entire 5G network, including virtualization infrastructure and management systems, from FY2019 to FY2021, and in April 2022 published the first edition of the 5G Security Guidelines⁹ outlining security issues of which operators should be aware and measures to address them. The Guidelines were approved as an international standard by ITU-T SG17¹⁰ in September 2024.

Telecommunications system configurations are becoming more complex as functions become more sophisticated, and OSS¹¹ is being used as a software component. Such changes in the software supply chain have resulted in the introduction of malicious code into software components, etc., and if the configuration of the software is not known, it is difficult to respond quickly to attacks.

In light of this situation, MIC carried out a demonstration project for introducing SBOM¹² in the telecommuni-

cations sector starting in FY2023 to help enhance cybersecurity through the use of SBOM, and prepared a draft set of points to keep in mind when creating and using SBOM.

Another demonstration project was conducted from FY2023 to ascertain the level of analysis capabilities and user information handling practices in Japan by having a third party carry out technical analyses of smartphone applications to determine the application behavior. With the “Act Concerning the Promotion of Competition in Relation to Specified Software Used in Smartphones” (Act No. 58 of 2024) coming into force as of FY2025, greater use of alternative distribution channels for apps other than the official stores operated by smartphone OS providers is anticipated in Japan. A survey is therefore being conducted to determine whether the operators of alternative distribution channels are taking measures to ensure security, etc., in compliance with the SPSP¹³.

(4) Efforts to ensure the safety of cloud services

MIC has formulated the “Guidelines for Information Security Measures in the Provision of Cloud Services,” which compiles information security measures for cloud service providers as an initiative to promote the safe and secure use of cloud services. A revised edition (the third edition) reflecting actual cloud service provision and use was published in September 2021.

Recent years have witnessed cases of cloud service users being unable to use cloud services appropriately, resulting in information leakage, so the “Guidelines for

Appropriate Settings in the Use and Provision of Cloud Services” were formulated in October 2022 after discussions among a wide range of entities, including providers and users, on ways to ensure that users make appropriate use of cloud services. The “Guidebook of Countermeasures for Improper Cloud Settings” was published in April 2024 to explain the contents of the Guidelines to cloud service users in an easy-to-understand manner.

(5) Trust service initiatives

Real space and cyberspace will be highly integrated in Society 5.0, and various interactions in real space must be carried out smoothly in cyberspace as well. To achieve this, it will be essential to build infrastructure enabling the safe and secure distribution of data; trust services (**Figure 2-2-5-1**), a mechanism to prevent data falsification and spoofing of transmission sources,

are becoming increasingly important.

Based on the “Priority Plan for the Realization of a Digital Society” (approved by the Cabinet on June 21, 2024)¹⁴, MIC is endeavoring to ensure proper implementation of time stamp systems and to formulate standards for evaluating the reliability of private-sector e-seal services,¹⁵ as well as to put in place conformity assessments.

A Development of a government time stamp certification system

Time stamps were examined by the “Panel on Time Stamp Certification Systems” launched by MIC in March 2020, and the “Regulations on the Accreditation of Time Certification Services” (MIC Notification No. 146 of 2021) were set forth in April 2021 to establish a government accreditation system overseen by the Minister for Internal Affairs and Communications. Because

of revisions made to the taxation system in FY2022, only those time stamps compliant with this accreditation system of the Minister for Internal Affairs and Communications are to be used for tax-related documents in the scanner preservation system under the Electronic Bookkeeping Act¹⁶ (Act No. 25 of 1998). As of May 2025, four companies have been accredited as time stamp

⁹ 5G Security Guidelines Version 1

https://www.soumu.go.jp/main_content/000812253.pdf

¹⁰ International Telecommunication Union Telecommunication Standardization Sector Study Group 17

¹¹ Refers to open source software, where the source code is released free of charge and can be used, improved, and redistributed by anyone

¹² Software Bill of Materials

¹³ Smartphone Privacy Security Initiative (SPSI) (https://www.soumu.go.jp/main_content/000981875.pdf)

¹⁴ Priority Plan for the Realization of a Digital Society

https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/5ecac8cc-50f1-4168-b989-2bcaabf870/6329b727/20240621_policies_priority_outline_03.pdf

¹⁵ An e-seal is electronic data that is attached to or logically associated with information recorded in an electromagnetic record and that meets the following two requirements: being used to indicate the source or origin of said information and being able to confirm whether or not said information has been altered.

¹⁶ Act on Special Provisions for the Methods of Preserving Books and Documents Relevant to National Taxes Prepared by Use of a Computer (Act No. 25 of 1998)

businesses. MIC will continue to run the accreditation system appropriately and reliably, and will seek to fur-

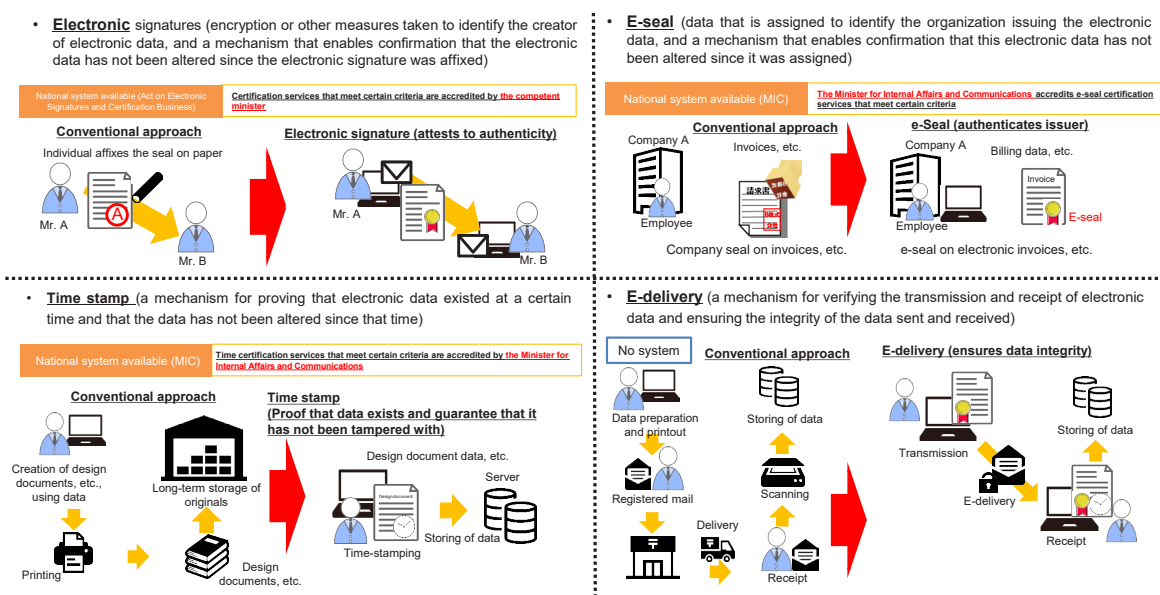
B Efforts to institutionalize e-seals

In April 2020, MIC launched the “Panel on Systems to Ensure the Reliability of Data Issued by Organizations,” which examined suitable approaches to the use of e-seals in Japan, and set out the “Guidelines for e-Seals” in June 2021 to provide certain standards regarding e-seal technologies and uses in Japan. In September 2023, the “Panel on e-Seals” was created to discuss the formulation of standards for evaluating the reliability of private-sector e-seal services and the establishment of conformity assessments¹⁷, and the “Guidelines for e-Seals (2nd Edition)”¹⁸ were published along with the Panel’s final report in April 2024. The “Expert Committee for the For-

ther expand the use of time stamps.

mulation of Relevant e-Seal Regulations” was convened in June 2024 for the purpose of helping formulate relevant regulations needed in preparation for an e-seal accreditation system, and in March 2025, the “Regulations for the Accreditation of e-Seal Certification Businesses” (MIC Notification No. 113 of 2025) established an accreditation system run by the national government (Minister for Internal Affairs and Communications). Going forward, MIC will work on designating an authorized investigative organization and related actions for full-scale operation.

Figure 2-2-5-1 Trust services



3. Improving cyberattack response capabilities and adapting to new technologies

(1) Efforts to develop security personnel

Cyberattacks are becoming more sophisticated and complex even as Japan’s cybersecurity personnel remain inadequate both qualitatively and quantitatively, so developing human resources for cybersecurity is an ur-

gent issue. To that end, MIC has been actively promoting cybersecurity human resource development initiatives (CYDER, CIDLE and SecHack365) through NICT’s National Cyber Training Center.

A Practical cyber defense exercise for information system managers (CYDER)

CYDER (CYber Defense Exercise with Recurrence) is a practical cyber defense exercise for information system personnel from national government agencies, local governments, independent administrative agencies, and critical infrastructure providers. Participants experience a series of cyberattack response methods, from incident detection to response, reporting, and recovery, while operating actual equipment in a large-scale virtual LAN environment that simulates an organization’s network

environment (Figure 2-2-5-2).

In FY2024, the existing beginner, intermediate, and semi-advanced level group exercises were joined by the “Pre-CYDER” program (Figure 2-2-5-3), in which participants can learn the basics of cyberattack mechanisms, trends, and incident handling.

4,225 people participated in the CYDER group exercise in FY2024, bringing the cumulative total to over 25,000 since FY2017.

¹⁷ Final Report of the Panel on e-Seals (https://www.soumu.go.jp/main_content/000942601.pdf)

¹⁸ Guidelines for e-Seals (2nd Edition) (https://www.soumu.go.jp/main_content/000942602.pdf)

Figure 2-2-5-2 CYber Defense Exercise with Recurrence (CYDER)

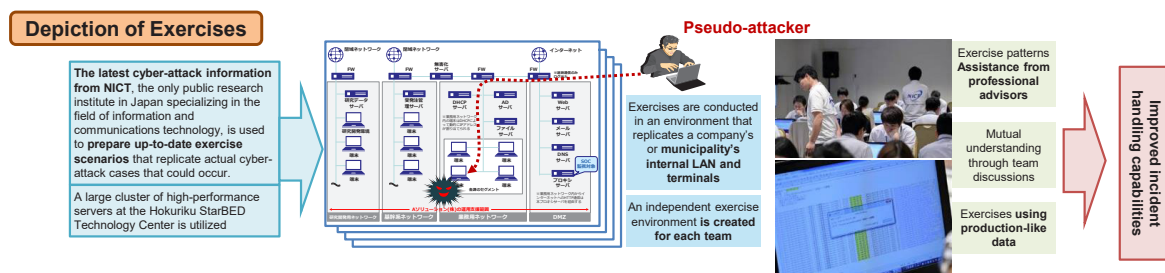


Figure 2-2-5-3 CYDER exercises in FY2024

Course name	Delivery method	Level	Target audience	Target organizations	Course venue	Course period
CYDER	A	Beginner	System novices (Incident response procedures)	For all organizations	All 47 prefectures	July - January of the following year
	B-1	Intermediate	System administrators and operators (proactive incident handling and security management)	Local governments	11 regions nationwide	October - January of the following year
	B-2			Organizations other than local governments	Tokyo, Osaka, Nagoya	January of the following year
	C	Pre-advanced	Security specialists (advanced security techniques)	For all organizations	Tokyo, Osaka	November - January of the following year
Pre-CYDER	Online	-	All information systems personnel (Acquisition and updating of minimum required knowledge)	For all organizations	(Participants' workplaces, etc.)	First half: May - July Second half: October - January

B Cyber Incident Defense Learning for EXPO (CIDLE)

CIDLE is a cyber defense training course for information system personnel from organizations connected with the Osaka-Kansai Expo, and it was designed to help ensure a complete security system for Expo 2025 (Osaka-Kansai Expo).

Lectures and seminar programs were offered from FY2023 to FY2024, utilizing the legacy of the Tokyo 2020 Olympic and Paralympic Games.

C Training program for young security personnel (SecHack365)

SecHack365 is a program for young ICT professionals under the age of 25 residing in Japan that seeks to develop cutting-edge security personnel (security innovators) who can create new security countermeasure techniques. Utilizing NICT data from actual cyberattacks,

leading researchers and engineers provide continuous and committed guidance on security technology R&D over the course of one year. In FY2024, 39 students completed the program, bringing the cumulative total since FY2017 to 328.

(2) Integrated platform for cybersecurity intellectual and human resource development (CYNEX)

Security providers in Japan mostly install and operate foreign security products. As a result, Japan's cybersecurity measures rely heavily on foreign products and foreign-derived information, and do not adequately collect and analyze domestic cyberattack information. In addition, the use of foreign security products continues to cause domestic data to flow to foreign operators and, with Japan's security-related information being analyzed overseas, the threat information obtained as a result of these analyses must be purchased from foreign operators.

Domestic security providers are consequently unable to accumulate core expertise and knowledge, and it is difficult for them to effectively contribute to information sharing at the global level and to train internationally competent engineers. User companies also lack the personnel needed to properly handle security products and security information. To enhance Japan's ability to autonomously cope with cyberattacks by developing cybersecurity personnel and adopting other approaches, it is necessary to establish an ecosystem that accelerates

cybersecurity information generation and human resource development in Japan.

In cooperation with NICT, which conducts top-level cybersecurity R&D in Japan, MIC has since FY2021 been promoting CYNEX (CYbersecurity NEXus), an initiative to improve Japan's cybersecurity response capability by establishing and operating an integrated platform for cybersecurity intellectual and human resource development as cutting-edge infrastructure that will serve as a major hub for cybersecurity-related industry-academia-government collaboration. The CYNEX Alliance, consisting of organizations from industry, academia, and government participating in CYNEX, was launched in October 2023 to begin full-scale deployment of CYNEX. In FY2025, MIC will continue to collect and analyze a wide range of cybersecurity information in Japan and utilize such information to promote the development of domestic security products, while expanding cooperation with other ministries/agencies, private companies, educational institutions, etc. MIC will also seek to further improve Japan's

cybersecurity response capabilities by fostering high-level security personnel and supporting human resource

development in government agencies, private companies, and educational institutions.



Figure (related data): Integrated platform for cybersecurity intellectual and human resource development (CYNEX)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00393>
(Data collection)

In FY2023, MIC launched an initiative to strengthen Japan's security measures by installing sensors that can verify security and transparency in some ministries and agencies, aggregating the collected cybersecurity information for analysis by NICT, and analyzing it by utilizing NICT's capabilities as part of the "Demonstration Project for the Collection and Analysis of Cybersecurity In-

formation Using Government Terminal Information (CYXROSS)". In FY2025, MIC will continue to expand the aggregation and analysis of cybersecurity information, and to bolster Japan's unique cyberattack analysis capabilities by expanding the number of government ministries/agencies that have introduced sensors.



Figure (related data): Demonstration Project for the Collection and Analysis of Cybersecurity Information Using Government Terminal Information (CYXROSS)
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00394>
(Data collection)

(3) Cybersecurity efforts connected with generative AI, etc.

While the employment of generative AI has been rapidly advancing in all fields in recent years, the risks associated with generative AI now include not only the spread of dis-/mis-information, privacy violations and infringements of intellectual property rights but also the exploitation of generative AI for cyberattacks. As cyberattacks become larger, more complex, and more sophisticated, the workload involved in implementing cybersecurity countermeasures is becoming an issue, and expectations are high that generative AI and other technologies will be utilized in cyberattack countermeasures as well.

Given this background, it is necessary to work on "Security for AI" to avoid or reduce security risks stemming from AI as much as possible while keeping abreast of

the latest trends in generative AI and other AI technologies, and to tackle "AI for Security" to effectively utilize AI in security measures.

In addition to formulating security guidelines for the safe and effective development and provision of AI, MIC will join together with NICT and specialist organizations in the US and elsewhere to conduct research and develop on AI safety and to promote the safe and secure use of generative AI through the "Security for AI" approach.

As an "AI for Security" initiative, MIC will promote the active use of generative AI in cybersecurity measures by collecting and analyzing cyberthreat information and using generative AI, etc., to refine and accelerate the detection of attack infrastructures.



Figure (related data): Cybersecurity efforts connected with generative AI, etc.
URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00395>
(Data collection)

4. Efforts to strengthen cybersecurity across local communities and beyond

(1) Forming locally-rooted security communities (local SECURITY)

Ensuring cybersecurity in communities is also an important issue from the perspective of ensuring a safe and secure cyberspace nationwide. Local companies and local governments may have difficulty in taking sufficient security measures on their own or fail to recognize the necessity of security measures due to the cybersecurity information gap between themselves and companies operating in the Tokyo metropolitan area or nationwide; they may also lack the required human and other management resources.

MIC promotes the formation of communities in the security field (“local SECURITY”) based on “mutual

aid” relationships among interested local parties; by FY2022, such communities had been established in all 11 regions defined by the jurisdictions of the Regional Bureaus of Telecommunications and related offices. In FY2024, 20 seminars, 14 incident response exercises, and three Capture The Flag (CTF) competitions for young people were conducted, and additionally nationwide CTF events were held simultaneously at seven venues. In 2025, MIC will continue supporting the expansion of local SECURITY initiatives by holding events and engaging in other activities.



Figure (related data): Security communities in various regions

MIC Support for Strengthening Local Security Communities (SECURITY)

URL: https://www.soumu.go.jp/main_sosiki/cybersecurity/localsecurity/index.html

(2) Telework security initiatives

According to a survey of companies that have introduced telework¹⁹, security has been the biggest issue in introducing telework. MIC has established and published “Telework Security Guidelines” since 2004 to dispel such security concerns and to enable companies to introduce and utilize telework with peace of mind.

Telework has spread in the wake of the COVID-19 pandemic and has taken center place in work style reform. In light of such changes in security as growing cloud utilization and more sophisticated cyberattacks, the Guidelines were revised in May 2021 in a complete overhaul of security measures to be implemented and the specific trouble cases to be considered.

Since it is assumed that small and medium-sized enterprises, etc., may not have a dedicated person in charge of security or that the person in charge of security measures may lack specialized knowledge, MIC has since 2020 formulated and published the “Telework Security Guide (Checklist) for Persons in Charge at Small and Medium Enterprises, etc.” with a focus on maintaining at least a minimum level of security. MIC has also published an “Explanation of Settings” that describes how to configure products used for teleworking when implementing security measures according to the Checklist; the “Explanation of Settings” was updated in July 2024.

(3) Wireless LAN security initiatives

Wireless LANs are used widely at home and at work, and public wireless LAN services can even be accessed in town. If appropriate security measures are not taken, though, wireless LAN devices can be used as a stepping stone for attacks and information theft. For this reason, MIC has established guidelines for both users and providers regarding security measures for wireless LANs; these guidelines were revised in February 2025 to reflect the latest security and technology trends²⁰.

The “Simple Manual for Public Wi-Fi Users” for users of public wireless LAN services and the “Simple Manual for Home Wi-Fi Users” for those who install and use

wireless LAN at home explain the security measures that users should keep in mind. The “Guide to Security Measures for Public Wi-Fi Providers” for restaurants, retail stores and other wireless LAN providers explains the required measures from two perspectives: that of users and that of the providers themselves.

To raise awareness of security measures for wireless LANs, free online courses on the latest security measures and related topics are also offered every year during Cybersecurity Month (February 1 - March 18). In FY2024, the online course “Learn Now: Wi-Fi Security Measures” was offered from February 5 to March 18, 2025.

(4) Cybersecurity Site for Citizens

MIC has created a “Cybersecurity Site for Citizens”²¹ to promote widespread awareness and understanding of cybersecurity among the general public so that Internet users can protect themselves from cyberattacks and prevent others from unintentionally causing trouble.

In May 2024, the article content was updated in light of the latest security trends to systematically present examples of damage caused by cyberattacks, steps to take in the event of a cyberattack, and preventive measures.

¹⁹ Fact-finding survey on telework security: https://www.soumu.go.jp/main_sosiki/cybersecurity/telework/

²⁰ Guidelines for Wireless LAN (Wi-Fi) Security: https://www.soumu.go.jp/main_sosiki/cybersecurity/wi-fi/

²¹ Cybersecurity Site for Citizens: https://www.soumu.go.jp/main_sosiki/cybersecurity/kokumin/

5. Further promotion of international cooperation

Since cyberspace has a global reach, cooperation with other countries is essential for establishing cybersecurity. To this end, MIC is actively engaged in discussions, information dissemination, and information gathering at various international conferences and cyber dialogues with the aim of contributing to the formation of international consensus on cybersecurity.

Support for developing countries' capacity building efforts in the field of cybersecurity is also important to reduce cybersecurity risks worldwide. MIC is engaged in human resource development projects in the ASEAN region through the ASEAN-Japan Cybersecurity Capacity Building Centre (AJCCBC) and other related actions, thereby contributing to the improvement of cybersecu-

rity capabilities in the ASEAN region and elsewhere²². Utilizing the know-how gained through AJCCBC activities, MIC has since FY2023 been expanding the scope of its activities to include, for example, new capacity-building support exercises for island countries and other locales in Oceania.

Additionally, for the sake of sharing information on international cybersecurity at the private-sector level with telecommunications carriers and others, MIC has hosted workshops attended by ISPs from ASEAN countries and has taken part in Japan-US and Japan-EU meetings via the Information Sharing and Analysis Center (ISAC).

²² See also Part II, Chapter 2, Section 8, "Pursuing International ICT Strategies" for more information on MIC's efforts at the ASEAN-Japan Cybersecurity Capacity Building Centre.

Section 6 Promotion of ICT usage

1. Summary

(1) Initiatives so far

Since the establishment of the Information and Communication Technology Strategy Headquarters in 2000 and the enactment of the Basic Act on the Formation of an Advanced Information and Telecommunications Network Society (Act No. 144 of 2000)¹, Japan has been promoting the utilization of ICT through various national strategies such as the e-Japan Strategy and the Comprehensive Strategy for the Vision for a Digital Garden City Nation. Based on these policies, MIC has been promoting the

utilization of ICT in various fields, including the digitalization of local communities and the revitalization of society through the use of new information and communication technologies and data circulation, in order to address social and economic issues such as the declining workforce due to a declining birthrate and aging population, the increase in medical and nursing care costs, and the exacerbation of natural disasters, as well as new issues arising from the expansion of digital spaces.

(2) Future challenges and directions

Japan faces a challenging economic environment, including a declining workforce due to a declining birthrate and aging population and a projected shrinkage of the domestic market. Additionally, there are mounting challenges such as coping with severe and frequent disasters and addressing the aging public infrastructure that has been in place for over 50 years.

For the solution of these issues, digitalization has the potential to significantly enhance the productivity and convenience of local communities, improve the quality of industries and livelihoods, and enhance the attractiveness of regions. The Government of Japan established the “Headquarters for Creating New Regional Economies and Living Environments” in FY2024 and started to examine large-scale regional revitalization measures to boost Japan’s economic growth based on the idea that local regions are the main drivers of growth. The basic policy on Regional Revitalization 2.0 and the basic concept for Regional Revitalization 2.0 identify the thorough

utilization and social implementation of new technologies such as AI and digital technologies as one of the pillars.

On the other hand, issues such as defamation, slander, and dis-/mis-information have become apparent in the information circulated on the Internet, while services provided by social media platform operators contribute to the improvement of daily convenience. Additionally, the emergence of new information and communication technologies such as generative AI and the metaverse is significantly transforming the digital space.

Considering these challenges, it is important to promote digital transformation (DX) to contribute to the revitalization of local communities and economies. Furthermore, it is crucial to ensure the soundness and drive the growth of the digital space and build a safe and secure environment for the use of information.

2. Promotion of DX to contribute to stimulate local communities and economy

Local communities and economies are facing a range of challenges, including declining workforce due to decreasing birthrate and aging population, shrinkage of the domestic market, frequent natural disasters and aging infrastructure. As mentioned in 1. (2) above, the Government of Japan identifies the thorough utilization and social implementation of new technologies, such as AI and digital technologies, as one of the pillars for regional revitalization in the “Basic Approach to Basic Approach to Regional Revitalization 2.0” (decided by the Cabinet on October 11, 2024) and in the “Basic Concept for Regional Revitalization 2.0” (decided by the Cabinet on June 13, 2025).

In order to maintain and further develop regional economy, thereby supporting the lives of local residents, it is necessary to solve regional issues through the full-

scale use of AI and other digital technologies (regional community DX) and create more value through innovation. To this end, it is important for companies making effective use of digital technologies to receive support in developing their business in response to local needs as the core players for regional community DX.

In recognition of these requirements, the MIC has been consulting the Information and Communications Council on the information and communications policies to foster regional community DX since February 2025. In response, the council has been identifying the issues regarding the information and communications policies for regional community DX in consideration of the situation of Japan’s local communities and economies and the latest trends of AI and other digital technologies to examine the direction of necessary measures.

¹ This act was abolished by the Basic Act on the Formulation of a Digital Society (Act No. 35 of 2021).

(1) Effective use of digital technologies to solve social issues more speedily

A Regional Community DX Promotion Package Project

In order to solve regional issues through the social implementation of digital technology (regional community DX) and realize Regional Revitalization 2.0, the MIC started implementing the “Regional Community DX Promotion Package Project” in FY2024. Under this project, the ministry aims to create good examples of digital implementation and speed up the practical application of digital technologies nationwide through comprehensive measures such as those to support the (1) securing of digital talent and systems, (2) the practical implementation of advanced solutions (pilot projects) and (3) estab-

lishment of regional communication infrastructure (subsidy programmes). In particular for (1), the ministry is implementing multiple support measures that each municipality can choose according to their respective needs, including those to support the prefectures and others in establishing a sustainable regional DX promotion system, to identify and summarize regional issues toward the implementation of digital technologies, and to offer experts’ advice on introduction and operation plans.

B Spread and promotion of the use of digital technologies

Issues including the following are identified as hindrances to the promotion of regional community DX by municipalities: lack of expertise, know-how and information, and the dispersion of information. For the solution of these issues, the MIC opened the “Local Community DX Navi” website² to centrally provide regional community DX-related information obtained by conducting surveys on advanced examples in each region in October 2024. By providing information on a continual basis through this website, the ministry is fostering the use of digital technologies by municipalities and local compa-

nies.

Also, in order to encourage the introduction of 5G equipment with ensured safety, reliability, supply stability and openness, the MIC treats certain local 5G equipment obtained by local 5G licensees preferentially in terms of fixed asset taxation. The main application target for this treatment has been revised to local 5G equipment used for the provision of residential Internet services, and the application period has been extended to the end of FY2026.

(2) Enhancement of support for regional digital talent and promotion of telework

A Fostering and securing talent to support regional community DX

(A) Regional informatization advisor dispatch system

Since FY2007, the MIC has been dispatching experts with knowledge and know-how in ICT (referred to as “Regional Informatization Advisors”) to municipalities and other entities upon request. These advisors provide advice, recommendations, and information to promote the use of ICT in solving regional issues, thereby contributing to the creation of vibrant and attractive communities and fostering human resources who can play a central role in the region. Furthermore, in FY2025, the MIC started dispatching the Regional Informatization

Advisors also to local companies on the condition that they were implementing projects jointly with municipalities as well as upon recommendation by municipalities.

In FY2025, 242 private sector experts with knowledge and know-how in regional informatization through research activities at universities, business activities in the region, NPO activities, etc., were appointed as “Regional Informatization Advisors,” and 297 dispatches were conducted.

(B) Establishment of a digital talent hub (tentative name)

There are multiple sharing schemes for the dispatch of digital talent to regions, which differ in targets, periods, purposes and skills of the experts to be dispatched. In view of this fact, a “digital talent hub” (tentative name) is planned to be established within FY2025 to help regions in need of digital talent select schemes and personnel fitted for their own goals.

The main functions of the digital talent hub are as follows: support regions in selecting the schemes appropri-

ate for their own goals from among the digital talent sharing schemes implemented by the MIC; and provide municipalities and regional areas in need of DX talent with information about the personnel that meet their needs from the lists of human resources provided by the schemes. The digital talent hub is thus expected to speed up regional informatization through appropriate matching.

B Promotion of telework

(A) Overview of telework

Due to the spread of COVID-19 since 2020, the telework introduction rate among companies reached 47.3%³ at the national average in 2024. The introduction

of telework has thus been promoted to some extent, but a trend towards returning to the office is observed in some companies. Also, there remain disparities between

² Local Community DX Navi website: <https://dx-navi.soumu.go.jp/>

³ 2024 Communications Usage Trend Survey
https://www.soumu.go.jp/johotsusintokei/statistics/data/250530_1.pdf

urban and rural areas and between industries with regard to the introduction rate.

To foster momentum for telework, the Telework Month Executive Committee (comprising the Cabinet Bureau of Personnel Affairs in the Cabinet Secretariat, the Office for Promotion of Regional Revitalization in the Cabinet Office, the Digital Agency, the MIC, the Ministry of Health, Labour and Welfare, the Ministry of Economy, Trade and Industry, the Ministry of Land, Infrastructure, Transport and Tourism, the Japan Tourism Agency, the Japan Telework Association, and the Japan Telework Society) designates November each year as “Telework Month,” a period for concentrated telework initiatives. During this month, surveys are conducted on the effects of telework (such as contributions to work style reform and operational efficiency), and events and seminars are organized by related ministries and agencies. Additionally, since 2015, the MIC has been giving

commendation to companies with significant telework achievements to incentivize telework adoption and provide reference examples for other companies considering telework.

In 2024, considering the situation where the adoption of telework had become relatively widespread, the MIC selected and announced companies and organizations that not only implemented telework systems and achieved significant utilization but also demonstrated management effectiveness through telework or implemented unique and excellent measures to make effective use of telework for operational reforms and others in industries considered unsuitable for telework. These entities were recognized as “Telework Top Runners 2024,” with the most outstanding initiatives receiving the “Minister for Internal Affairs and Communications Award.”

(B) Support for the promotion of telework

To support the adoption of telework among SMEs and in regional areas, where implementation rates remain low, the MIC has established regional consultation desks in collaboration with local chambers of commerce and local governments nationwide. These desks provide consultation services and other support. Additionally, the MIC offers free individual consultations by experts (telework managers) to companies considering the introduction or improvement of telework, aiming to promote the effective use of telework. Since FY2022, these

support services have been operated in an integrated manner with the Ministry of Health, Labour and Welfare’s labor-related telework consultation services and are now jointly implemented as the “Telework One-Stop Support Project.”

Furthermore, to address the common concern of information security in telework, the MIC has developed the “Telework Security Guidelines” and the “Telework Security Handbook for SMEs (Checklist)” to serve as references for companies implementing telework.

(3) Promotion of the safe and secure use of important data

A Development of disaster information systems

Japan is one of the world’s most disaster-prone countries, and each time a large-scale natural disaster occurs, it suffers significant social and economic damage. Given the ongoing predictions of large-scale natural disasters,

such as the Nankai Trough Earthquake, it is crucial to efficiently utilize ICT to mitigate human and material damage caused by disasters.

(A) Development of a disaster-resilient fire and disaster prevention communication network

To collect and transmit information related to damage situations, a communication network that can reliably function even during disasters is essential. Therefore, the current infrastructure includes several key communication networks that connect the national government, the Fire and Disaster Management Agency, local governments, and residents. These networks are: (1) the Central Disaster Prevention Radio Network for collecting and transmitting information within the government; (2) the Fire and Disaster Prevention Radio Network connecting the Fire and Disaster Management Agency with

prefectures; (3) the Prefectural Disaster Prevention Administrative Radio Network connecting prefectures with municipalities; (4) the Municipal Disaster Prevention Administrative Radio Network connecting municipalities with residents; and (5) the Satellite Communication Network connecting the national government with local governments or between local governments. Additionally, efforts are being made to introduce high-performance and cost-effective next-generation systems for the satellite communication network.

(B) Deployment of mobile communication equipment for disaster response

The MIC lends mobile communication equipment for disaster response to local governments to ensure communication in affected areas even if mobile phone networks are disrupted. (As of May 2025, 1,065 simple radios, 179 MCA radios, and 100 satellite phones are deployed across the Regional Bureau of Telecommunications and other sites nationwide.)

Following the Noto Peninsula Earthquake, which occurred in January 2024, more satellite internet equipment and public safety mobile systems were installed. These devices are used to build communication environments in evacuation centers and to support the collection and transmission of disaster information, as well as the smooth execution of emergency recovery activities.

(C) Securing emergency communication means during disasters

To prepare for situations where public telecommunication services become difficult to use during disasters, the MIC has been deploying ICT units (attaché case type) to the Regional Bureaus of Telecommunications and other related agencies nationwide since FY2016.

(D) Stable operation of the Nationwide Instantaneous Warning System (J-Alert)

The Fire and Disaster Management Agency has established the “Nationwide Instantaneous Warning System (J-Alert)” to instantly transmit information on urgent situations, such as ballistic missile alerts, emergency earthquake warnings, and major tsunami warnings, from the national government to residents via emergency alert emails to mobile phones and municipal

(E) Promotion of the use of L-Alert

The MIC promotes the use of the common platform (L-Alert) that allows local governments to simultaneously send disaster-related information, such as evacuation orders, to various media, including numerous broadcasters and internet service providers. L-Alert has achieved nationwide operation across all 47 prefectures and has become an essential part of the disaster information infrastructure.

Amid the intensification and more frequent occur-

These units are lent to disaster-related organizations upon request to ensure necessary communication means. (As of May 2025, 25 units are deployed across the Regional Bureau of Telecommunications and other sites.)

disaster prevention administrative radios. To ensure the rapid and reliable transmission of emergency information via J-Alert, municipalities are urged to thoroughly check the proper functioning of J-Alert-related equipment, and efforts are being made to promote the redundancy of J-Alert information transmission methods.

rence of disasters, measures are being taken to increase the stability and reliability of L-Alert for the system to continue to play its role. Moreover, studies are being made for data linkage between L-Alert and other disaster control systems for contribution to the entire government's DX for disaster control. Furthermore, for more effective use of L-Alert, the MIC conducts seminars for users of the system, such as employees of municipalities.

B Promotion of ICT utilization in the medical field

Japan has entered a super-aging society, facing challenges such as increasing medical and nursing care costs and the uneven distribution of medical resources.

To address these issues, the MIC is working to build and enhance a foundation for utilizing medical, nursing, and health data to improve and streamline medical and health services. The main focus is on promoting “Telemedicine” and “Utilization of PHR⁴ data.”

Specifically, to promote the spread of telemedicine, which is expected to be a key solution to the uneven distribution of medical resources, the Japan Agency for Medical Research and Development (AMED) has been conducting R&D activities to support telesurgery by the use of robots since FY2022, with the results scheduled to be announced in the summer of 2025 in the form of the revised guidelines for telesurgery by the Japan Surgical Society. Since FY2023, research and development have been conducted to build a data distribution infrastructure necessary for obtaining PHR data required by doctors from various PHR services to enhance medical

care and refine diagnostic content.

In addition, in consideration of the changes caused to the security measures for medical information systems and services due to the diversification and sophistication of cyberattacks on them and of the increased importance of agreements concluded between medical facilities and medical information system providers, the “Guidelines for Safety Management in Information Systems and Service Providers Handling Medical Information” (the MIC and the Ministry of Economy, Trade and Industry) were revised in FY2024. Furthermore, to promote the safe and secure use of PHR services, the “Basic Guidelines for Handling Medical Checkup and Related Information by PHR Service Providers” (MIC, the Ministry of Health, Labour and Welfare, and the Ministry of Economy, Trade and Industry) were revised in FY2025 for the first time in about three years, following the diversification of PHR services and the revision of the security requirements.

C Promotion of ICT utilization in the education field

During the period from FY2021 to FY2022, in order to promote the utilization of ICT in the education field, the MIC, in collaboration with the Ministry of Education, Culture, Sports, Science and Technology, formulated the necessary technical specifications (reference model) to realize the “Digital Education Platform” that enables data linkage between digital learning systems

owned by companies outside schools.

Moreover, since FY2023, the MIC has been conducting studies to make effective use of PDS (Personal Data Store) in the education field towards the goal of providing individuals with optimal learning opportunities through the safe and secure use of educational data. Specifically, to this end, the ministry has checked and

⁴ PHR stands for Personal Health Record. It generally refers to an individual's lifelong health and medical information, including health check-ups, vaccination history, medication information, test results, and other medical-related information, as well as personal vital signs measured daily. It is expected to be accurately understood by the individuals as an electronic record and utilized for their own health promotion.

clarified the technical requirements to be met for PDS and identified the points to be noted for practical opera-

D Social implementation of information banks

From the perspective of promoting the appropriate utilization of personal data, including personally identifiable information, the MIC and the Ministry of Economy, Trade and Industry established a study group on the certification scheme for information trust functions. In June 2018, they compiled the “Guidelines for Certification of Information Trust Functions ver1.0,” which outlines a voluntary certification system for information

tion, while carrying out demonstration tests.

banks by a private sector organization, with ongoing reviews of the guidelines. Based on these guidelines, the Information Technology Federation of Japan is serving as a certification body for information banks.

Continuously, in FY2025, the MIC is conducting studies on information banks and how to utilize them, in consideration of the changes made to services and businesses using personal data and their expansion.

(4) Discovery and development of ICT startups

In Japan, 2022 was designated as the inaugural year for startup creation, with the goal of increasing investment in startups tenfold over five years. This goal was set forth in the “Startup Development Five-year Plan” (decided at the New Capitalism Realization Conference in November 2022), aiming to create an ecosystem that fosters and nurtures startups.

The MIC has been implementing the ICT STARTUP LEAGUE project since FY2023, under which the public and private sectors are sharing roles to support startups throughout the process—from exploratory R&D activities through to commercialization—in an integrated manner for the development of next-generation industries by

the creation and use of advanced ICT.

The MIC and the NICT host the “Entrepreneur Koshien” and “Entrepreneur Expo” to award and support excellent business plans from students aiming to start businesses and from startup companies, with the objective of solving regional issues and revitalizing the economy through the creation of ICT startups originating from local areas. At Expo 2025 Osaka, Kansai, Japan, the MIC and the NICT plan to organize an exhibition titled “Initiatives by ICT Startups Shaping the Future,” featuring displays by past award winners from Entrepreneur Koshien and Entrepreneur Expo and others.

3. Responses to dis-/mis-information on the Internet

(1) Promotion of comprehensive measures

A Summary

Dis-/mis-information on the Internet, such as social media, circulates and spreads quickly and could exert serious influence on people’s daily lives and socioeconomic activities. In light of this fact and related international trends, the MIC has been proactively implement-

ing comprehensive measures against such information, including institutional measures, support for the development of countermeasure technologies, and the improvement of literacy across generations, while giving due consideration to freedom of expression.

B Institutional measures

(A) Information Distribution Platform Act and others

Illegal and harmful information has continued to be distributed on the Internet, and in view of the seriousness of the situation, the MIC has been continuously implementing measures in cooperation with relevant parties against a range of illegal and harmful information, including defamation, slander and piracy.

Due to the aggravation of issues related to defamation and slander on platform services, such as social media, the MIC is implementing the following measures in cooperation with related organizations and based on the policy package to deal with defamation and slander on the Internet compiled and announced in September 2020: (1) awareness-raising activity to improve information ethics and ICT literacy among users; (2) support for platform operators’ voluntary measures and the improvement of their transparency and accountability; (3) disclosure of sender information; and (4) enhancement

of consulting services.

Also, via the “Study Group on Platform Services”⁵, the MIC interviewed platform operators and published the second summary on the future direction of measures against dis-/mis-information in August 2022.

Based on the discussion results, the “Working Group on Countermeasures against Illegal and Harmful Information such as Defamation and Slander,” was organized in December 2022 for experts to discuss the following in a technical and intensive manner: (1) how to ensure the transparency and accountability regarding the deletion of information by platform operators and (2) roles to be played by platform operators to effectively prevent the distribution of illegal and harmful information. As a result of discussion made by this working group, it was deemed appropriate to require service providers offering services for interaction among unspecified users,

⁵ This study group met during the period from October 2018 to January 2024 to discuss how to ensure the appropriate handling of user information by platform operators and how to deal with illegal and harmful information on the Internet (chaired by SHISHIDO George, Graduate School for Law and Politics, The University of Tokyo).

specifically those above a certain size to do the following with regard to the removal of illegal and harmful information, such as defamation and slander, including the establishment of legal arrangements: (1) make mandatory responses within a predefined period; (2) set criteria and disclose the operational situation for higher transparency.

In reference to the report made by this working group, the “Study Group on Platform Services” published the third summary in February 2024, based on which the Act to Partially Amend the Act on the Limitation of Liability of Specified Telecommunications Service Providers⁶ was enacted in May 2024. Under this revised law, the Act on the Limitation of Liability of Specified Telecommunications Service Providers was renamed as the Act on Measures Against Rights Infringement, etc. Arising from Distribution of Information by Specified Telecommunications (“Information Distribution Platform Act”).

In order to enforce this amended act, the MIC clarified what kind of information distribution constitutes an infringement of rights or a violation of laws and regula-

tions, and formulated the “Guidelines on Illegal Information”⁷ to provide examples of illegal information that large-scale specified telecommunications service providers should refer to when formulating the “standards for the implementation of transmission prevention measures.”

In addition, as measures against piracy on the Internet, the MIC has been conducting the following activities based on the “Policy Menu of Anti-piracy Measures on the Internet” (December 2020): awareness-raising to improve information ethics and ICT literacy among users; promotion of the introduction of security software for access control; review of the sender information disclosure system; and enhancement of international collaboration through discussions at international forums such as ICANN.

Moreover, based on the summary report (in September 2022) made by the “Study Group on Measures to Suppress Access to Piracy Sites on the Internet,” the MIC confirmed progress with the Policy Menu and initiatives implemented by related companies and others.

(B) Digital advertising

The number of investment scams on social media reported and the amount of damage caused by these scams reached 8,684 and about 114.9 billion yen, respectively, over two years from January 2023 to December 2024. Victims of these scams are cheated out of money, making payments for “investment” or for “withdrawal fees” to swindlers, who make the victims trust them through frequent online communication without meeting in person⁸.

Banner ads for about 50% of all the means of initial contact for the purpose of investment scams on social media. In particular, SNS-based investment fraud, initiated through advertisements that impersonate well-known individuals or major corporations by using their names, photos and other materials without permission (spoofing-type “false advertisements”) to induce users to participate in investment seminars and businesses, has become a serious issue.

In response, the MIC requested large-scale social networking service (SNS) operators respond to spoofing-type “false advertisements” on their platforms based on the “Comprehensive Measures to Protect People from Frauds” (decided by the Ministerial Meeting Concerning Measures against Crime on June 18, 2024)⁹.

In October 2024, after the request was made, the “Working Group on Digital Advertising,” held under the “Study Group on Addressing Issues Related to Informa-

tion Distribution in the Digital Space” (hereinafter, “Study Group”) interviewed five platform operators to whom the request was made (ByteDance, Google, LINE Yahoo!, Meta and X) about their measures against spoofing-type “false advertisements” and published an evaluation report on the interviews in November¹⁰. In the evaluation report, the platform operators were requested to make further improvements regarding the advance screening of ads and the removal of spoofing-type “false advertisements”. Also, the report stated that the MIC would monitor the measures taken by the operators in its effort to identify the measures that need to be implemented for the protection of users of social media and other services.

On the distribution of digital ads, it is also required to implement measures to address risks caused by the placing ads unintentionally on the media that infringe copyright or provide dis-/mis-information. These risks include damage to the brand of the advertiser, waste of advertising costs and contribution to the spread of dis-/mis-information. In order to deal with these risks, the MIC published the “Guidance on the Appropriate and Effective Distribution of Digital Ads for Advertisers” on June 9, 2025, based on the recognition that it is important for those in charge of ads and the management team to raise their awareness of the risks concerning digital advertising.

⁶ Act to Partially Amend the Act on the Limitation of Liability of Specified Telecommunications Service Providers for Damages and the Right to Demand Disclosure of Sender Identification Information (Act No. 25 of 2024)

⁷ Guidelines on Article 26 of the Act on Measures Against Rights Infringement, etc. Arising from Distribution of Information by Specified Telecommunications (Enacted on March 11, 2025)

⁸ Number of special frauds, investment scams via social media and romance scams reported and the number of arrests for these crimes in FY2024 (data finalized by the National Police Agency)

⁹ https://www.npa.go.jp/bureau/criminal/souni/tokusyusagi/hurikomesagi_toukei2024_teisei.pdf

¹⁰ https://www.soumu.go.jp/menu_news/s-news/01ryutsu02_02000411.html

¹¹ https://www.soumu.go.jp/main_content/000978858.pdf

(C) Further examination for institutional improvement

As mentioned above, the Healthiness Study Group made recommendations related to institutional measures. However, the environment surrounding the distribution of information in digital space has continued to change, making it necessary to examine measures against new issues, such as those concerning the posting of messages on social media to recruit people for illegal part-time jobs. Based on the fact that trials and errors were repeated also outside Japan to deal with issues concerning the distribution of information in digital

C Development and demonstration of technologies to address the issues

Effective use of generative AI, which is featured with the speed of technological innovation, contributes to the solution of social issues and greater industrial competitiveness. However, it can also cause risks to people's daily lives, and in order to deal with dis-/mis-information on the Internet, it is necessary to be prepared for further elaboration and sophistication of generative AI and other

space, the “Working Group on Institutional Measures for the Distribution of Information in Digital Space” was organized in January 2025 under the Study Group to discuss how to improve the systems related to the distribution of information in digital space.

The working group plans to identify the desirable direction of institutional improvement by the summer of 2025 based on the results of surveys conducted on relevant trends in foreign countries and of interviews with platform operators.

er technologies.

Accordingly, the MIC is working on the development and demonstration of technologies to check whether or not images posted on the Internet were created by generative AI and to ensure the authenticity and reliability of information senders.

(2) Promotion of ICT literacy for a wide range of generations**A Development of awareness-raising materials**

To address changes in the ICT environment, including the expansion of opportunities for ICT use across a wide range of generations and the issue of the distribution of dis-/mis-information on the Internet, the MIC has been holding the “Study Group on Improving ICT Literacy for ICT Utilization”¹¹ since November 2022 and established the “Working Group on Improving ICT Literacy for Youth” in December 2022, advancing discussions on literacy required in the future digital society and on strategies for promoting literacy enhancement. Based on the results of discussions held by the groups, a “Roadmap for Improving ICT Literacy for ICT Utilization” was compiled and published in June 2023. The roadmap shows the direction of measures to be implemented on a short- and medium-term basis. In FY2023, as an initiative to be implemented on a short-term basis, the competencies necessary to improve literacy for ICT utilization were identified, and learning content to deal with issues shared by a range of age groups was devel-

oped. Subsequently in FY2024, awareness-raising materials were developed in consideration of the features of different age groups (the youth, their parents and the elderly) as an initiative to be implemented on a medium- to long-term basis.

On the “Let’s Use the Internet Wisely! - A Guide to Safe and Secure Internet Use -” website, which is intended to raise awareness for safe and secure use of the Internet¹², content for pre-school children, parents of these children, the youth, their parents and teachers, and the elderly is posted to help them improve their ICT literacy.

In FY2024, against dis-/mis-information, the MIC revised its awareness-raising material, “How to Use the Internet: To Avoid Being Misled by Dis-/Mis-Information,” created to prevent people from being deceived by such information¹³, in consideration of the latest cases, impact of generative AI and others.

B Implementation of public-private collaboration projects to improve ICT literacy in a comprehensive manner

In 2025, the MIC launched DIGITAL POSITIVE ACTION as a public-private collaboration project in cooperation with platform operators, telecommunications carriers, IT-related companies, and other related organizations. Under this project, the MIC is collaborating with relevant companies and organizations to implement measures for the improvement of ICT literacy, including the opening of a website on measures taken by the public and private sectors and conducting a range of PR activities.

The slogan of this project, “DIGITAL POSITIVE ACTION” expresses the strong commitment of the national government, companies, organizations and individual citizens to taking actions one after another to make the digital society a positive one. This slogan, along with the slogan that states, “Create and protect a safe information society” in Japanese and a mark symbolizing the happiness of people constitute the logo of the project. **(Figure 2-2-6-1)**

¹¹ “Study Group on Improving ICT Literacy for ICT Utilization”

https://www.soumu.go.jp/main_sosiki/kenkyu/ict_literacy/index.html

¹² https://www.soumu.go.jp/use_the_internet_wisely/

¹³ https://www.soumu.go.jp/use_the_internet_wisely/special/nisegojouhou/

Figure 2-2-6-1 DIGITAL POSITIVE ACTION logo and slogan

つくろう！守ろう！安心できる情報社会



(3) Promoting the use of AI and responding to associated risks

Recently, the development of AI technologies has been rapidly progressing, leading to the widespread use of AI services, including OpenAI's ChatGPT service, which was launched in November 2022. AI technologies, particularly generative AI, pose concerns and risks about the spread of dis-/mis-information, but are also expected to make great contributions to higher productivity and addressing labor shortage issues, attracting far more attention to the potential of AI across the world.

Furthermore, based on the outcomes of the G7 Hiroshima Summit held in May 2023, the "Hiroshima AI Process" was initiated to discuss issues related to generative AI and international rules on such AI.

In December of the same year, the "Comprehensive Policy Framework for the Hiroshima AI Process" was compiled and approved by the G7 leaders. The Hiroshima AI Process will continue to advance, led by the G7 countries and supported through cooperation with multilateral platforms such as the OECD, the GPAI, and the United Nations, under the "Work Plan to Advance the Hiroshima AI Process"¹⁴.

Domestically, in response to the rapid changes in AI technology and international discussions, the national government established the AI Strategic Council in May 2023 as a command center to conduct intensive discussions with experts possessing a wide range of knowledge on various issues. Based on the "Tentative Summary of AI Issues" (May 2023) compiled by the AI Strategic Council, the MIC and the Ministry of Economy, Trade and Industry formulated and announced the "AI Guidelines for Business"¹⁵ Version 1.0 in April 2024. In line with the rule of updating them as necessary in consideration of the trends of AI, international discussions and other developments, the guidelines were updated to version 1.01 in November of the same year and again to version 1.1 in March 2025, taking into account

the latest trends both in Japan and overseas, including the widespread use of RAG and multimodal AI.

Furthermore, as the development of rules regarding AI continued both in Japan and overseas, the first meeting of the AI Institutional Study Group¹⁶ was held to discuss issues for institutional improvement, including the necessity of AI-related laws, in August 2024 under the AI Strategic Council. Then, an "Interim Report"¹⁷ was compiled in February 2025, and based on this report, the Act on Promotion of Research and Development, and Utilization of Artificial Intelligence-related Technology was enacted at the 217th session of the Diet (ordinary session) (Act No. 53 of 2025). This law provides for the establishment of the Artificial Intelligence Strategic Headquarters for the national government to do the following to promote AI innovation while mitigating risks posed by it as its basic approach: formulate the Artificial Intelligence Basic Plan that shows the basic policy on AI measures to be implemented by the government, establish guidelines to ensure the appropriateness of AI in accordance with the international norms, and conduct research and studies, collect information and give advice to relevant companies.

Moreover, as mentioned above, in light of the fact that the development of AI technologies and the use of AI have been rapidly progressing both in the public and private sectors, the national government needs to promote the utilization of generative AI in its operations while controlling the associated risks. Accordingly, the Digital Agency made studies for the formulation of "The Guideline for Japanese Governments' Procurements and Utilizations of Generative AI for the sake of Evolution and Innovation of Public Administration" which were approved at the Council for the Promotion of a Digital Society Executive Board Meeting on May 27, 2025¹⁸ for announcement.

(4) Promoting safe and secure metaverse utilization

Recognizing the need to ensure a safe and secure cyberspace, the MIC has been working to identify and organize new issues related to cyberspace, anticipating the future widespread adoption of the metaverse. In and af-

ter August 2022, meetings of the "Study Group on the Utilization of Metaverse toward the Web3 Era"¹⁹ were held and a report²⁰ was compiled by the Study Group in July 2023.

¹⁴ For discussions by G7 countries, refer to (1) "G7/G20," (2) "Hiroshima AI Process" and (10) "GPAI" in Section 8.5, Chapter 2, Part II.

¹⁵ AI Guidelines for Business https://www.soumu.go.jp/main_sosiki/kenkyu/ai_network/02ryutsu20_04000019.html
https://www.meti.go.jp/shingikai/mono_info_service/ai_shakai_jisso/20240419_report.html

¹⁶ AI Institutional Study Group https://www8.cao.go.jp/cstp/ai/ai_kenkyu/ai_kenkyu.html

¹⁷ Interim Report https://www8.cao.go.jp/cstp/ai/interim_report_en.pdf

¹⁸ https://www.digital.go.jp/en/resources/standard_guidelines

¹⁹ Holding "Study Group on the Utilization of Metaverse toward the Web3 Era" (Press release)
https://www.soumu.go.jp/menu_news/s-news/01icp01_02000109.html

²⁰ https://www.soumu.go.jp/main_content/000892205.pdf

Based on the report, a new “Study Group on Realizing Safe and Secure Metaverse²¹” was launched in October 2023 to examine principles based on the democratic values of the metaverse, follow up on technological trends, and contribute to international discussions on the metaverse toward the realization of safe and secure metaverse for users. In October 2024, this study group published “2024 Report²²” which includes the first version of the “Principles of the Metaverse” that summarize the measures to be implemented by metaverse-related service providers to ensure the safety and security of users through the provision of democratic value of metaverse.

Based on “2024 Report,” the MIC has been striving to realize and promote safe and secure metaverse utilization while implementing measures to build a common international understanding about the metaverse based on the first version of the Principles of the Metaverses. On the international front, the MIC introduced the outcomes of discussions held in Japan, such as the first version of the Principles of the Metaverse, at meetings including the OECD’s Digital Policy Committee’s meeting and the “Global Multistakeholder High Level Confer-

ence on Governance of Web 4.0 and Virtual Worlds” held from March to April 2025 by the European Commission. Also, in Japan, the MIC held a “Symposium on Considering the Promotion of Safe and Secure Metaverse Utilization²³” in March 2025 for metaverse-related companies, organizations and researchers to discuss measures for users’ safety and security, points to be noted for successful metaverse introduction, and the effect of introduction.

The “Study Group on Realizing Safe and Secure Metaverse” expanded its discussion target to include the use of the metaverse for various purposes other than the provision of VR for communication and entertainment between individuals, regardless of the details of technologies used for the realization and utilization of the metaverse. This was done in view of the advancement of devices for augmented reality (AR) and mixed reality (MX), the multipurpose use of metaverse, and the progress of the market. Also, in reference to the results of discussions held at the aforementioned symposium, the study group is continuing discussion for the revision of the first version of the Principles of the Metaverse.

4. Creation of the safe and secure environment of ICT usage

(1) Improvement of support for digital utilization by the elderly and others

As the digitalization of society progresses, the MIC has been working on the “Project on Digital Utilization Support for Users” since FY2021 to provide support through training sessions in the form of advice and consultations for the elderly and others who are anxious about using smartphones for online administrative pro-

cedures and other services, with the aim of eliminating the digital divide and creating an environment where everyone can benefit from digitalization. In FY2024, these efforts were expanded to include conducting training sessions at over 6,000 locations nationwide, mainly at mobile phone shops.

(2) Establishment of a safe internet environment for the youth

The MIC is promoting filtering to prevent the youth from accessing harmful information on the Internet and raising ICT literacy of children, parents, and others for the safe and secure use of the Internet by the children.

Specifically, the MIC has been conducting “e-Net Caravan” free outreach sessions at schools and other educational institutions for children, students, parents, and educators to ensure a safe and secure Internet environment. Additionally, the ministry created and published an “Internet Trouble Case Collection²⁴” that summarizes methods for preventing Internet-related issues, and an-

nually conducts the “Internet Literacy Assessment Indicator for Students (ILAS)²⁵” test nationwide targeting first-grade senior high school students to visualize their ability to cope with risks and threats on the Internet and assess the current situation.

Also, the MIC is working to effectively raise the awareness of parental controls that can be set up in line with the growth stage of children and their Internet usage status²⁶, in light of the fact that the youth are sharing more information via the Internet and the lowering trend in the age of children using the Internet.

²¹ Holding “Study Group on Realizing Safe and Secure Metaverse” (Press release)

https://www.soumu.go.jp/menu_news/s-news/01iicp01_02000121.html

²² https://www.soumu.go.jp/main_content/000974751.pdf

²³ Holding a “Symposium on Considering the Promotion of Safe and Secure Metaverse Utilization” (press release)

https://www.soumu.go.jp/menu_news/s-news/01ryutsu20_02000001_00012.html

Report on the “Symposium on Considering the Promotion of Safe and Secure Metaverse Utilization” by the MIC
<https://prtimes.jp/main/html/rd/p/000000002.000157444.html>

²⁴ Internet Trouble Case Collection (2025)

https://www.soumu.go.jp/use_the_internet_wisely/trouble/

²⁵ Survey on the Internet Literacy Assessment Indicator for Students (ILAS)

—ILAS (Internet Literacy Assessment indicator for Students)—

https://www.soumu.go.jp/use_the_internet_wisely/special/ilas/

²⁶ It means that parents oversee their children’s internet use appropriately, considering their developmental stage and life cycle. This includes preventing troubles that may arise from children’s information dissemination. Management methods are divided into technical means (such as filtering, billing restriction functions, and time management functions) and non-technical means (such as creating rules between parents and children). (General Principles for Child-Related Measures (Cabinet Decision on December 22, 2023), P50)

(3) Support for research and development towards information barrier-free

The MIC provides partial subsidies to companies conducting research and development of technologies related to communication and broadcasting services for people with disabilities and the elderly, as part of the “Research and Development for Eliminating the Digital Divide” program. In FY2024, subsidies were provided to five entities.

Additionally, under the Act on Advancement of Facili-

tation Program for Disabled Persons’ Use of Telecommunications and Broadcasting Services, with a View to Enhance Convenience of Disabled Persons (Act No. 54 of 1993), the NICT provides subsidies to companies and organizations developing and providing communication and broadcasting services for people with disabilities. In FY2024, subsidies were provided to four entities.

(4) Improvement of information accessibility

To make it easier for everyone, including the elderly and people with disabilities, to use public institution websites, the MIC conducted a partial revision of the “Guidelines for Operating Everyone’s Public Websites” in FY2024. In the same fiscal year, the ministry conducted a survey on JIS compliance of public institution websites and online workshops for public institutions.

Efforts are also being made to promote the use of self-assessment forms for information accessibility among companies and organizations.

The “Information Accessibility Self-Assessment Form” is a tool for companies and organizations to publicly disclose the results of their self-assessment of whether or not their ICT equipment and services meet

information accessibility standards, serving as a reference for companies, public institutions, and people with disabilities when selecting ICT equipment and services. This self-assessment form was created by the MIC, drawing on the Voluntary Product Accessibility Template (VPAT) used in the U.S. In the U.S., the law mandates that the government must procure accessible electronic information equipment.

The MIC has been promoting the use of these forms in both the public and private sectors through the establishment of support centers, seminars, and the collection of good practices, as well as the updating of guidebooks.

(5) Provision of telephone relay service as public infrastructure

The “Telephone Relay Service” is a service where sign language interpreters and other operators act as intermediaries, interpreting sign language and text from individuals with hearing impairments or other disabilities that affect auditory, speech, or vocal functions which make it difficult for them to communicate through spoken language, to facilitate communication via telephone between these individuals and those without such impairments.

To ensure the proper and reliable provision of the “Telephone Relay Service,” the Act on Facilitating the Use of Telephones by Persons with Hearing Impairments, etc. (Act No. 53 of 2020) was enforced in December 2020. Subsequently, in July 2021, the Nippon Foun-

dation Telephone Relay Service, which was designated as the provider of the telephone relay service, started to provide the telephone relay service as part of public infrastructure (**Figure 2-2-6-2**). On January 23, 2025, under the service, the “Yometeru” phone voice transcription service began to be offered to callers who have hearing impairments but want to talk on the phone (**Figure 2-2-6-3**), so that they can “read” what the receiver says. The MIC has been conducting PR activities in cooperation with related governmental agencies in order to further promote the use of the telephone relay service, and the number of users registered with the service reached 17,480 people as of the end of FY2024.

Figure 2-2-6-2 Promoting the use of the telephone relay service



Figure 2-2-6-3 Promoting the use of Yometeru



Section 7 Trends in ICT technology policy

1. Summary

(1) Initiatives so far

The MIC has been promoting technology policies in the field of information and communication, focusing on efforts towards Beyond 5G, which is expected to become the next-generation fundamental information and communication infrastructure, serving as the foundation for various industries and social activities and being utilized across borders.

Specifically, since the establishment of the “Beyond 5G Promotion Strategy” by the MIC in June 2020, discussions on the “Strategy for Information and Communication Technology towards Beyond 5G” have been progressing within the Information and Communications Council. Additionally, a research and development fund has been established based on this strategy, aiming to strengthen support for research and development activities related to Beyond 5G and international standardization efforts by private entities and others.

Furthermore, the “6th Science, Technology, and In-

novation Basic Plan” was approved by the Cabinet on March 26, 2021, and relevant governmental ministries and agencies are collaborating and cooperating to foster R&D in advanced fields, aiming to achieve a sustainable and resilient society that ensures the safety and security of citizens. Accordingly, the MIC is pushing ahead with measures in the fields of AI, quantum technology, remote sensing, space and others.

The NICT is promoting fundamental and foundational research and development in five key areas (advanced electromagnetic wave technology¹, innovative networks², cybersecurity³, universal communication⁴, and frontier science⁵) during the 5th medium- to long-term plan period (from April 2021 to March 2026).

Additionally, the MIC is providing support for the creation of technological innovations and for startups, which are one of the key players in implementing advanced ICT and fostering next-generation industries.

(2) Future challenges and directions

For Beyond 5G, the MIC announced the “Strategy for Realizing Next-Generation Information and Communication Infrastructure to Support AI Society - Beyond 5G Promotion Strategy 2.0 -” on August 30, 2024 in view of the progress of measures implemented by the public and private sectors and a shift to the phase aimed at social implementation and overseas deployment and of the environmental changes and issues, such as the explosive spread of AI systems. Based on this strategy, the ministry has been pressing forward with measures including R&D, international standardization, social im-

plementation and overseas deployment.

Moreover, the Information and Communications Council has been conducting studies on the R&D fields and issues to be prioritized by the national government and the NICT in the ICT field and on the measures to promote the deployment of the R&D results based on the “6th Science, Technology and Innovation Basic Plan” and the NICT’s medium- to long-term targets for the next term, while paying attention to recent social changes, technological progress and market trends.

2. Beyond 5G

On September 30, 2021, the MIC consulted the Information and Communications Council on the “Strategy for Information and Communication Technology towards Beyond 5G,” and an interim report was compiled on June 30, 2022, containing recommendations for Japan’s focus on key technology areas for Beyond 5G and the establishment of a framework enabling multi-year budgeting.

Based on this interim report, the Act to Amend the Act on the National Institute of Information and Communications Technology, National Research and Development Agency and the Radio Act (Act No. 93 of 2022)

was enacted in December 2022, leading to the full-scale operation of the research and development fund established at the NICT in March 2023.

Furthermore, following the compilation of the final report on June 18, 2024, the MIC announced the “Strategy for Realizing Next-Generation Information and Communication Infrastructure to Support AI Society - Beyond 5G Promotion Strategy 2.0 -” on August 30, 2024 to support companies in the private sector in implementing measures including those for R&D, international standardization, social implementation and overseas deployment.

¹ R&D into fundamental and basic technologies for advanced data collection and high-precision observation by using various sensors as well as the promotion of standardization and the diffusion and social implementation of R&D results

² R&D into fundamental and basic technologies for connecting terrestrial and satellite networks in a multilayered manner to respond to the explosive increase of communication volume as well as promotion of standardization and the diffusion and social implementation of R&D results

³ R&D into cybersecurity technologies to protect social systems from rapidly increasing cyberattacks and as well as promotion of standardization and the diffusion and social implementation of R&D results

⁴ R&D into fundamental and basic technologies for the creation of new knowledge and value by the use of artificial intelligence and others as well as the diffusion and social implementation of R&D results.

⁵ R&D into advanced and basic technologies for the creation of innovations as well as the diffusion and social implementation of R&D results.

(1) Implementation of the Innovative Information and Communication Technology (Beyond 5G (6G)) Fund Project

The MIC is implementing the Innovative Information and Communication Technology (Beyond 5G (6G)) Fund Project based on the Act to Amend the Act on the National Institute of Information and Communications Technology, National Research and Development Agency and the Radio Act (Act No. 93 of 2022) enacted and enforced in December 2022, establishing a permanent fund at the NICT in March 2023 as a successor to the temporary fund set up in February 2021.

Under the aforementioned fund project, three programs have been established: the “Social Implementation and Overseas Deployment-Oriented Strategic Program” that fosters research and development projects for social implementation and overseas deployment; the “Element Technology and Seed Creation-Oriented Program” targeting the establishment of long-term element technologies and the creation of technology seeds; and the “Radio Effective Utilization Research and Development Program” targeting the research and development of technologies specified in Article 103-2, Paragraph 4, Item 3 of the Radio Act (Act No. 131 of 1950).

In particular, for the “Social Implementation and Overseas Deployment-Oriented Strategic Program,” which is the major target of the fund project, based on the interim report made by the Information and Communications Council, “all photonics network technology⁶,” “non-terrestrial network (NTN) technology⁷,” and “secure virtualization and integration network technology⁸” are regarded as priority technology areas. Also, the program is divided into two categories: “business strategy sup-

port type” to intensively support research and development projects that have social implementation and overseas deployment strategies and commitments; and “common infrastructure technology establishment type” for the national government to lead the development of technologies in cross-industrial common infrastructure or cooperation domains necessary for the early realization of social implementation and overseas deployment.

In FY2023, 17 major research and development projects were adopted in the Social Implementation and Overseas Deployment-Oriented Strategic Program (business strategy support type) and others based on the “Appropriate Evaluation of Business Aspects of the Innovative Information and Communication Technology (Beyond 5G (6G) Fund Project)” (announced on March 10, 2023), which was compiled by the “WG on Innovative Information and Communication Technology Project Business Evaluation”⁹ under the Information and Communications Council (Information and Communication Technology Subcommittee on Technology Strategy). Also, support started to be provided to international standardization activities to be conducted as part of the projects. Furthermore, in FY2024, new initiatives for Beyond 5G were launched in the Social Implementation and Overseas Deployment-Oriented Strategic Program (common infrastructure technology establishment type) through the effective use of the fund, including the development of common infrastructure technology for inter-operator cooperation in all-photonics networks.

(2) Promotion of intellectual property and standardization activities for Beyond 5G

The MIC has been promoting R&D in the priority technology field including all-photonics network technology through the Innovative Information and Communication Technology (Beyond 5G (6G)) Fund project. Also, the ministry is working for the international standardization of the R&D results by supporting companies promoting the social implementation and overseas deployment of their R&D results through the fund project in conducting international standardization activities.

In order to make achievements in international standardization activities, companies need to regard international standardization as part of their business strategy and strategically work on standardization based on management’s commitment. Based on this recognition, the MIC set the “Requirements for Supporting International Standardization Activities” (announced on March 18, 2024) to be met for companies conducting international standardization activities through the fund project to receive support from the ministry and has been supporting these companies that meet the requirements. The requirements for support were set based on the “Ap-

proach to Support for International Standardization Activities through the Innovative Information and Communication Technology (Beyond 5G (6G)) Fund Project” (announced on March 8, 2024), which was compiled based on discussions by the “Innovative Information and Communication Technology Project Business Evaluation WG” under the Technology Strategy Committee of the Information and Communication Technology Subcommittee of the Information and Communications Council. Specifically, companies are required to (1) conduct activities under a system led by top management based on the business strategies; (2) regard international standardization as part of the business strategies; and (3) conduct specific activities for international standardization. In FY2024, the MIC supported nine entities in conducting international standardization activities from among those implementing R&D projects under the Social Implementation and Overseas Deployment-Oriented Strategic Program (business strategy support type).⁹

Furthermore, in preparation for Beyond 5G, the “Beyond 5G New Business Strategy Center” was estab-

⁶ Technology for the end-to-end transformation of a wired network into an optical network by the use of photonics-electronics convergence technology to realize ultra-high-speed, ultra-low-latency and ultra-energy-efficient communication infrastructure

⁷ Technology for seamless HAPS and communication satellite connection across land, sea, air and space to establish communication infrastructure in non-residential areas and to make information infrastructure redundant in case of large disasters

⁸ Technology to transform hardware into software to build highly flexible communication infrastructure to meet user needs, thereby ensuring safe and highly reliable communication environment for users

⁹ Changed the name of the WG from “Innovative Information and Communications Technology Project WG” (February 22, 2024)

lished in December 2020 to strategically promote international standardization and intellectual property activities under corporate management strategies and through industry-academia-government collaboration. The Center has been conducting a range of activities to develop leaders for standardization and intellectual property activities, promote industry collaboration, raise awareness and disseminate information. Specific activities include cross-organizational training programs for young talent at the core of next-generation corporate management, such as the “Leader Forum,” and awareness-raising and information dissemination seminars for companies, especially for their management and business departments, known as the “New Business Strategy Seminar.” Additionally, a new industry collaboration activity, “XG Ignite,” bridging information and communication technologies, digital domains and various other fields and industries, has been conducted since FY2023.

Additionally, in order to advance international standardization activities from the early stages of research and development, the MIC has been fostering international joint R&D with research institutions of countries and regions that can generate synergy effects with Japan as its reliable strategic partners. Specifically, in 2025, international joint R&D was started with the European Commission for the AI-based autonomous operation and control of wireless networks based on the “Japan-EU Digital Partnership” (May 2022) under the Innovative Information and Communication Technology

(3) Initiatives for the diffusion and expansion of Beyond 5G systems

Beyond 5G Promotion Strategy 2.0 expects that the next-generation information and communication infrastructure to support the AI society of 2030s will be a low-latency, energy-efficient, high-quality, flexible and low-cost infrastructure. To meet this expectation, it is essential to establish and sophisticate all-photonics network technologies, for which Japan has strengths, towards social implementation and full-scale utilization.

The MIC has been conducting R&D to build an ultra-high-speed, ultra-low-latency and energy-saving communication infrastructure by using all-photonics network technologies under the Innovative Information and Communication Technology (Beyond 5G (6G)) Fund project. In addition, for social implementation and full-scale utilization of developed technologies by around 2030, it is necessary to enable a range of stakeholders to

(Beyond 5G (6G)) Fund project “Element Technology and Seed Creation Program.” Moreover, based on the Letter of Intent for Cooperation in Communication Technologies signed by the Minister for Internal Affairs and Communications of Japan and the Minister for Education and Research of the Federal Republic of Germany in May 2023 as well as on the results of the 7th Japan-Germany ICT Policy Dialogue held in June of the same year, the two sides started to conduct international joint R&D on digital twin technology for all-photonics networks in 2025.

In April 2024, the “Beyond 5G Promotion Consortium” and the “5th Generation Mobile Communications Promotion Forum (5GMF)” were integrated into the “XG Mobile Promotion Forum (XGMF)” to enhance the promotion structure for next-generation mobile communications and further accelerate efforts toward the social implementation of Beyond 5G technologies. The XGMF has been conducting studies based on the future technological trends of Beyond 5G and its use scenarios as part of its activities and announced the “Beyond 5G White Paper version 4.0” in December 2024.

Furthermore, in October 2024, in cooperation with XGMF, the Association of Radio Industries and Businesses, and the University of Tokyo, MIC held the “5G International Workshop,” “Local 5G International Workshop” and “5G/6G International Conference” as 5G/6G Special Day events at CEATEC 2024.

actually test and verify the technologies for commercialization and other purposes at an early stage. The earlier establishment of such a verification environment is expected to help Japan speed up the technology, product and service commercialization cycles leveraging Japan’s strengths and enable the early social implementation of all-photonics networks ahead of other countries. Moreover, it will help Japan enhance its international competitiveness through the overseas deployment of commercialized technologies, products and services.

Against this backdrop, the MIC decided to build an innovation hub for various stakeholders to conduct tests and verification activities for commercialization step by step and aims to start the full-scale establishment and expansion of the hub in FY2026 after formulating a development plan for it within 2025.

(4) Trends in Japan and overseas surrounding Beyond 5G

A Initiatives by private sector entities

The number of domestic and international participants in the industry forum “IOWN Global Forum,” established by NTT, Intel and Sony in 2019 as part of NTT’s IOWN concept¹⁰, has been steadily increasing. In addition, Japan’s telecommunications industry has been making efforts as a whole, with KDDI joining the forum

in March 2023, following Rakuten Mobile’s participation.

In March 2023, NTT East and West commenced commercial services for “IOWN 1.0,” which is an all-photonics network that achieves ultra-low latency, and in 2025 offered the services to Expo 2025 Osaka, Kansai pavilion.

¹⁰ The “Innovative Optical and Wireless Network (IOWN) concept” is led by NTT to create an affluent society rich in diversity by optimizing society as a whole and as individuals, for which photonics-based innovative technologies will be utilized to realize high-speed large-volume communication beyond the limitations of conventional infrastructure and provide a vast amount of computing resources to build networking and information processing infrastructure including terminals.

ions and event facilities at the Yumeshima venue. Also, KDDI and SoftBank announced the introduction of all-photonics networks into their core networks.

Regarding non-terrestrial network (NTN) technologies such as low-earth orbit satellites and high-altitude platform station (HAPS) technologies, SoftBank is promoting the utilization of HAPS through the “HAPS Alliance,” aiming to integrate various communication technologies into a single system to provide ubiquitous

B Initiatives towards social implementation

Various private sector entities and organizations are advancing efforts towards social implementation for Beyond 5G.

The IOWN Global Forum is collaborating with various industries to consider use cases for the realization and proliferation of the IOWN concept, targeting practical use and commercialization around 2025, in addition to envisioning the future around 2030. They have cited early adoption examples around 2025, such as data center connections for the financial industry and remote/cloud media production for the broadcasting industry. They plan to proceed with specification development and verification towards commercialization.

In fact, in June 2023, Tokyu Land Corporation agreed to collaborate with NTT and its affiliates on new urban

C Initiatives towards overseas expansion

In preparation for Beyond 5G, NTT and its group companies are working on global deployment, including the establishment of the IOWN Global Promotion Office. NTT and NTT Data Group have conducted demonstrations of data center interconnection using all-photonics networks in the U.S. and the UK. In October 2023, NTT and Chunghwa Telecom in Taiwan signed a basic agreement to realize international network connections based on IOWN. Subsequently, in August 2024, an all-photonics network was opened, connecting Chunghwa Tele-

communication on land, at sea and in the air. Space Compass and NTT DoCoMo have been implementing measures for the launch of HAPS services in 2026. To this end, they announced that they had succeeded in data communication demonstration experiments in Kenya in February 2025. Also, in February 2024, Rakuten Mobile announced a plan to provide domestic services using satellite-to-mobile direct communication in 2026 in collaboration with AST SpaceMobile.

development utilizing IOWN-related technologies and services, with the initial implementation being the introduction of IOWN 1.0 to “Shibuya Sakura Stage” in December 2023.

Furthermore, towards international standardization, organizations such as the NICT and the “Beyond 5G Promotion Consortium” have been contributing to the international vision for Beyond 5G. In November 2023, a framework recommendation was approved by ITU-R, reflecting proposals from Japan, outlining the capabilities and use cases for “IMT-2030,” with 6G in mind.

Additionally, at the World Radiocommunication Conference 2023 (WRC-23), frequencies and other resources were secured for the realization of Beyond 5G, including non-terrestrial network (NTN) technologies such as HAPS.

com’s data center to NTT’s Musashino R&D Center over a distance of about 3,000 km. Additionally, in February 2024, Fujitsu announced joint discussions with Chunghwa Telecom to build all-photonics networks based on the IOWN concept in Taiwan. Subsequently in August 2024, the company opened an open APN laboratory, aiming to expand its all-photonics network business in Europe. In the optical field, Japanese companies have been expanding their share of major transmission equipment in the global market, particularly in North America.

3. AI technologies

Since the proposal of deep learning in 2006, the third AI boom has arrived, leading to significant technological innovations in fields such as image recognition and natural language processing. Furthermore, in 2022, the trend of generative AI¹¹, which can automatically generate images and text based on learned data, began to gain popularity worldwide, intensifying the competition in the development of generative AI. In Japan, the development of generative AI has become active in numerous companies in the private sector, academia, and other entities. Simultaneously, the utilization of generative AI in a wide range of industrial sectors is progressing, showing signs of bringing about a major transformation in society.

The MIC, based on the “AI Strategy 2022” (decided by the Integrated Innovation Strategy Promotion Council in April 2022) and the “Tentative Summary of AI Issues” (AI Strategic Council in May 2023), is collaborating with the NICT, a member of AI core related centers, to conduct a wide range of research and development and social implementation related to natural language processing technologies such as large-scale language models and multilingual speech translation, distributed federated machine learning technologies, and AI technologies based on cognitive models of the brain and brain-inspired mechanisms.

(1) Strengthening the development capability and risk response capability of LLMs

The NICT has accumulated one of the largest collec-

tions of language data in Japan through years of research

¹¹ In 2022, generative AI systems, such as Stable Diffusion (capable of converting text to images) and ChatGPT (capable of automatic text generation) were released.

and development in AI technology. In addition, in July 2023, it prototyped a large language model (LLM) based on high-quality Japanese data created from the language data, demonstrating expertise in constructing high-quality language data for learning, which is required for LLM development. Leveraging the data and expertise possessed by the NICT, efforts are underway to enhance Ja-

pan's LLM development capability by preparing large-scale and high-quality Japanese-centric language data for learning required for the development of LLMs and providing LLM developers in Japan with access to the data. Additionally, research and development efforts are being made for technologies to support the verification, analysis and improvement of LLM generated text.



Figure (related data) Process of the development and use of LLMs and initiatives by the NICT

URL:<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00400>

(Data collection)

(2) Research and development for advanced multilingual translation technology

The MIC, in collaboration with the NICT, is working on research and development of multilingual translation technology to eliminate the “language barrier” worldwide and achieve free global communication. The NICT’s multilingual translation technology, utilizing the latest AI technology, has achieved practical-level translation accuracy for 21 languages, in anticipation of use by foreign visitors to Japan and foreign residents in Japan,

and for diplomatic responses. Furthermore, the MIC and the NICT are promoting the social implementation of multilingual translation technology. The NICT provides “VoiceTra,” a research app for individual travelers, and over 40 private services have been deployed through technology transfer¹², utilized by government agencies and in a wide range of fields such as disaster prevention, transportation, and healthcare.



Figure (related data) Multilingual translation technology

URL:<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00401>

(Data collection)

In anticipation of Expo 2025 Osaka, Kansai, Japan, to further advance NICT’s multilingual translation technology, the MIC formulated the “Global Communication Plan 2025” in March 2020. Based on this plan, the MIC is working on the establishment of a computing environment for the NICT to conduct AI research and develop-

ment at the world’s top level and has been conducting research and development since FY2020 to achieve “simultaneous interpretation” that goes beyond the conventional short-sentence sequential translation, addressing business and international conference discussions.



Figure (related data) Initiatives to further advance multilingual translation technology

URL:<https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/datashu.html#f00402>

(Data collection)

In FY2025, a translation engine developed by the NICT was utilized at Expo 2025 Osaka, Kansai, Japan for simultaneous interpretation in 30 languages through a translation app and at seminars. Furthermore, the MIC

is collaborating with Global South and other countries for the demonstration and evaluation of LLMs that support multiple languages.

4. Quantum technologies

(1) Trends in quantum security network policy

Quantum technology is an innovative technology that has the potential to bring about transformative and discontinuous advances in future society and the economy, and it is also of critical importance from the perspective of economic security. In response, countries and regions such as the U.S., Europe, and China have formulated promotion strategies for quantum technology and are implementing strategic initiatives, including the promotion of research and devel-

opment, the establishment of research hubs, and human resource development.

In order to lead global innovation in quantum technology ahead of the rest of the world, Japan formulated the Quantum Technology Innovation Strategy (decided by the Integrated Innovation Strategy Promotion Council in January 2020), which comprehensively organized a wide range of initiatives spanning from research and development to social implementation across various tech-

¹² Council for the Promotion of Global Communication Development: Examples of Products and Services by Private Companies Utilizing Multilingual Translation Technology from the NICT https://gcp.nict.go.jp/news/products_and_services_GCP.pdf

nological fields, including quantum computing, quantum software, quantum security and quantum networks, and quantum measurement and sensing / quantum materials. Subsequently, in light of expanding international investment and other developments, Japan formulated the Quantum Future Society Vision (decided by the Integrated Innovation Strategy Promotion Council in April 2022), the Quantum Future Industry Creation Strategy (decided by the Integrated Innovation Strategy Promo-

tion Council in April 2023), and the Promotion Measures toward the Creation and Development of the Quantum Industry (reported by the Quantum Technology Innovation Council in April 2024). Through these initiatives, Japan aims to strengthen its technological development capabilities by promoting research and development, while also advancing the development of a broad range of human resources related to quantum technology.

(2) Research and development of quantum cryptographic communication technology

With the practical realization of quantum computers, there are concerns that cryptographic systems currently in widespread use may become compromised. In response, the MIC, in collaboration with NICT, private-sector companies, universities, and other stakeholders, is promoting research and development on quantum cryptographic communication technologies and related technologies that can reliably detect eavesdropping based on the physical properties of quantum mechanics.

In addition, in line with the government-wide strategy, MIC established a Quantum Security Hub at NICT in fiscal year 2021 as a core base under the Quantum Technology Innovation Strategy in the field of quantum security and quantum networks, and is undertaking a broad range of initiatives, including the promotion of social implementation through the construction and utilization of testbeds, as well as human resource development.

A Research and development for the social implementation of quantum cryptographic communication

Quantum Key Distribution (QKD) technology, which transmits encryption key information on photons, is utilized for quantum cryptographic communication, and for its practical use, it is necessary to increase the communication speed, extend the communication distance and expand the communication area. In order to meet these major challenges, the MIC has been working on the research and development of long-distance link technology and relay technology for terrestrial quantum cryptographic communication for five years since FY2020. In FY2025, the MIC decided to start conducting R&D into technologies to further increase the speed of quantum cryptographic communication networks and

sophisticate these networks, and large-scale networking technologies for the early social implementation of these networks. In addition, through the Space Strategy Fund established at the Japan Aerospace Exploration Agency (JAXA) in March 2024, technologies for quantum cryptographic communication devices that can be mounted on small satellites will be developed based on the technological development theme of “developing and demonstrating satellite quantum cryptographic communication technologies.” Through these measures, the MIC will continue to work for the early establishment of global quantum cryptographic communication networks.

B Establishment of quantum cryptographic communication testbeds and promotion of social implementation

In Japan, NICT has been engaged from an early stage in research and development of the elemental technologies for quantum cryptographic communication. For the purpose of demonstration and verification of quantum cryptographic communication, NICT established the quantum cryptographic communication testbed known as the “Tokyo QKD Network” in 2010, and has continuously operated it since then. Based on the long-term operational experience of the Tokyo QKD Network, the basic specifications for quantum cryptographic communication equipment were formulated and adopted in 2020 as international standards (ITU-T Y.3800 series), and these specifications possess

a high level of international competitiveness.

In addition to applications for information exchange among critical domestic institutions, quantum cryptographic communication is also expected to be deployed in commercial services such as finance and healthcare, and there is a strong demand for its early practical implementation. Accordingly, since FY2021, the MIC has been developing a quantum cryptographic communication testbed that enables demonstrations of network configurations, including route control, in a multi-node architecture connecting multiple sites, including private-sector entities, and is working to accelerate social implementation through usage verification in real-world environments.

C Research and development for the realization of a quantum internet

The quantum Internet, which enables stable long-distance communication while preserving quantum states, is expected to serve as a foundational communication technology underpinning the utilization of a wide range of quantum technologies, including secure communications and distributed quantum computing. Accordingly, since FY2023, the MIC has initiated research and development aimed at realizing a quantum Internet,

including the development of technologies such as quantum entangled photon sources and quantum memories, as well as the integration of highly precise phase synchronization technologies—such as those based on optical clocks—with quantum networks, and research and development to establish fundamental and core technologies including multi-party quantum communication and quantum communication protocols.



Figure (related data) Image of communication network of quantum cryptographic at the global level
 URL: <https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r07/html/dashu.html#f00403>
 (Data collection)

5. Remote sensing technologies

At the NICT, research and development of remote sensing technology is being conducted to observe conditions such as rainfall, water vapor, wind, and the earth's surface with high temporal and spatial resolution. This is aimed at early detection and elucidation of the development mechanisms of sudden atmospheric phenomena such as linear precipitation zones and localized torrential rainfall, as well as rapid assessment of damage situations during disasters.

Research and development efforts include the deployment of a Multiparameter phased array weather radar (MP-PAWR) capable of high-speed and high-precision three-dimensional observation of rain clouds and promoting the utilization of its data. Other efforts include the R&D of technology to estimate the amount of water vapor in the atmosphere using the propagation delay of

digital terrestrial broadcasting waves, wind profiler technology capable of observing wind speed in the upper atmosphere, ground-based water vapor and wind LiDAR technology using eye-safe infrared pulse lasers capable of simultaneously observing water vapor and wind, and satellite-based cloud and precipitation observation technology.

At Expo 2025, Osaka, Kansai, Japan, three-dimensional observations of cumulonimbus clouds and other rain clouds in the Osaka area will be conducted by using two Multiparameter Phased Array Weather Radars (MP-PAWR), and the results will be analyzed by a supercomputer and others to provide highly accurate weather forecast information that has never been available before to the Japan Association for the 2025 World Exposition as well as to visitors to the Expo.



Figure (related data) Demonstration of the provision of “highly accurate weather forecast information” at Expo 2025 Osaka, Kansai, Japan
 URL: https://www.soumu.go.jp/main_content/001003941.pdf

6. Space ICT

Among space activities, space communication is a field that provides a large market and is expected to grow further. Space communication is being increasingly utilized during disasters, on isolated islands, at sea and in mountainous areas in Japan, with its importance growing for national security and resistance against disasters. Also, outside Japan, various companies are working on the development of new technologies and services for space communication. For Japan to increase its independence and autonomy in space communication, it is necessary for Japanese communication service providers and manufacturers of communication devices and other related equipment to have sufficient international competitiveness. Based on this recognition, the MIC is implementing measures to sophisticate commu-

nication and radio use in space. Specifically, the ministry is pushing ahead with R&D and demonstration projects through the Space Strategy Fund for the provision of satellite optical communication-based data relay services and for frequency-sharing technologies aimed at the integrated operation of satellite communication and terrestrial network systems.

While solar radiation following the occurrence of solar flares could hinder radio communication and satellite positioning, the NICT makes space weather forecast 24 hours a day, 365 days a year. Furthermore, the institute is developing space environment data acquisition equipment to be mounted on the next-generation geostationary meteorological satellite (Himawari-10).

Section 8 Promotion of international strategies for ICT

1. Summary

(1) Initiatives so far

Based on the “Infrastructure System Overseas Promotion Strategy 2030” (decided by the Ministerial Meeting on Strategy relating to Infrastructure Export and Economic Cooperation on December 24, 2024)¹, the MIC has been actively engaged in the overseas expansion of digital infrastructure and digital solutions. This includes activities such as project discovery, proposal and formation, as well as providing comprehensive support for companies, including support for human resource development, maintenance, and finance, from the stage of development to commercialization.

Furthermore, the ministry has actively participated in

bilateral policy dialogues, including dialogues with the U.S., as well as multilateral forums such as the G7 and G20, actively engaging in discussions on the digital economy and international rule-making, thereby contributing to the formation of global frameworks.

In addition, as digital infrastructures such as submarine optical cables and 5G networks have become essential supporting people’s daily lives and economic activities, the MIC has worked to ensure their safety and reliability from the perspective of economic security as well through international cooperation.

(2) Future challenges and directions

The acceleration of social and economic digitalization is leading to an increased demand for the development and enhancement of communication networks and effective digital solutions for problem-solving. Moreover, the importance of high-quality infrastructure has been highlighted as discussions on economic security have intensified. In this context, leveraging bilateral and multilateral frameworks to expand Japan’s high-quality infrastructure overseas not only contributes to addressing domestic social issues in various countries but also helps tackle global challenges such as climate change, and further contributes to the realization of the SDGs. Additionally, enhancing the international competitiveness and global presence of Japan through the dissemination and development of digital technologies is crucial for the economic development of the nation.

In light of these circumstances, in June 2025, the MIC decided the basic policies and measures to be imple-

mented for the core digital fields of the “Infrastructure System Overseas Promotion Strategy 2030” to enhance Japan’s international competitiveness and economic security toward 2030 and formulated the “Comprehensive Strategy for Digital Overseas Promotion 2030².” Going forward, based on this strategy, the MIC will set the priority fields to enhance Japan’s international competitiveness and economic security based on concepts such as “global-first” and “market-in” and through the enhancement of collaboration with like-minded countries for the promotion of strategic measures from R&D through to the acquisition of shares in the global market.

Furthermore, in order to take a leading role in international rule-making in the digital field, the MIC will proactively participate in international discussions through international conferences and other opportunities.

2. Expansion of digital infrastructures overseas

In the context of the increasing global demand for communication infrastructure and services due to the advancement of digitalization in society and the economy, the MIC is enhancing the international competitive-

ness of Japan’s digital industry and promoting global problem-solving using digital technology by measures such as supporting overseas deployment of digital infrastructure.

(1) Overseas promotion support tools by the MIC

The MIC is implementing initiatives that take into account the circumstances and challenges of each country, providing support tailored to each phase from basic research to demonstration projects for the overseas expansion of Japan’s high-quality digital infrastructure.

Additionally, in February 2021, the MIC established the “Japan Platform for Driving Digital Development,” a public-private partnership framework to support the

overseas expansion of Japan’s ICT (**Figure 2-2-8-1**). As of the end of January 2025, more than 200 members including Japanese ICT companies and related governmental ministries and agencies are participating in this framework to share information about 70 countries and regions through a database, hold workshops, form teams, and discuss specific projects.

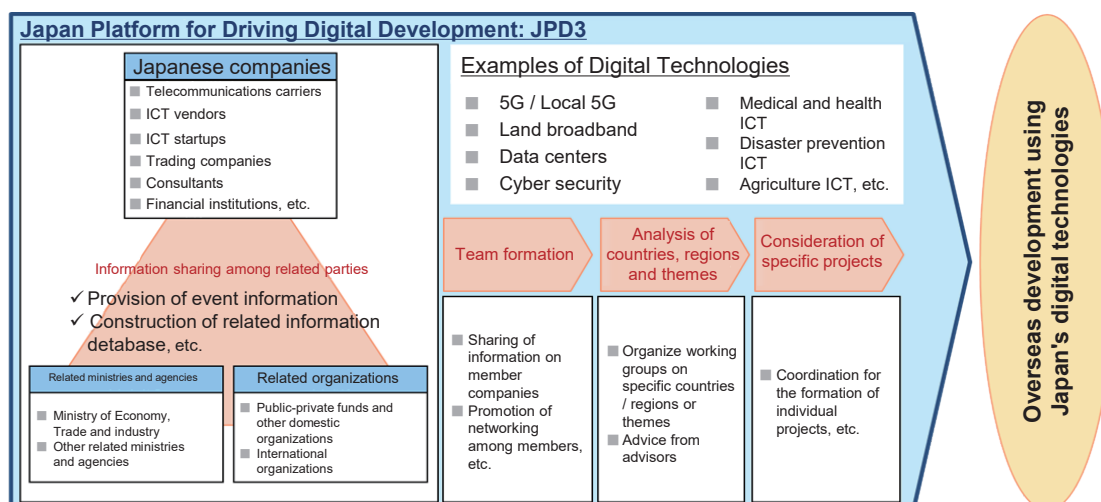
¹ Infrastructure System Overseas Promotion Strategy 2030

<https://www.kantei.go.jp/jp/singi/keikyuu/dai58/siryou6.pdf>

² Announcement of the “Comprehensive Strategy for Digital Overseas Promotion 2030” (June 11, 2025)

https://www.soumu.go.jp/menu_news/s-news/01tsushin06_02000319.html

Figure 2-2-8-1 Japan Platform for Driving Digital Development



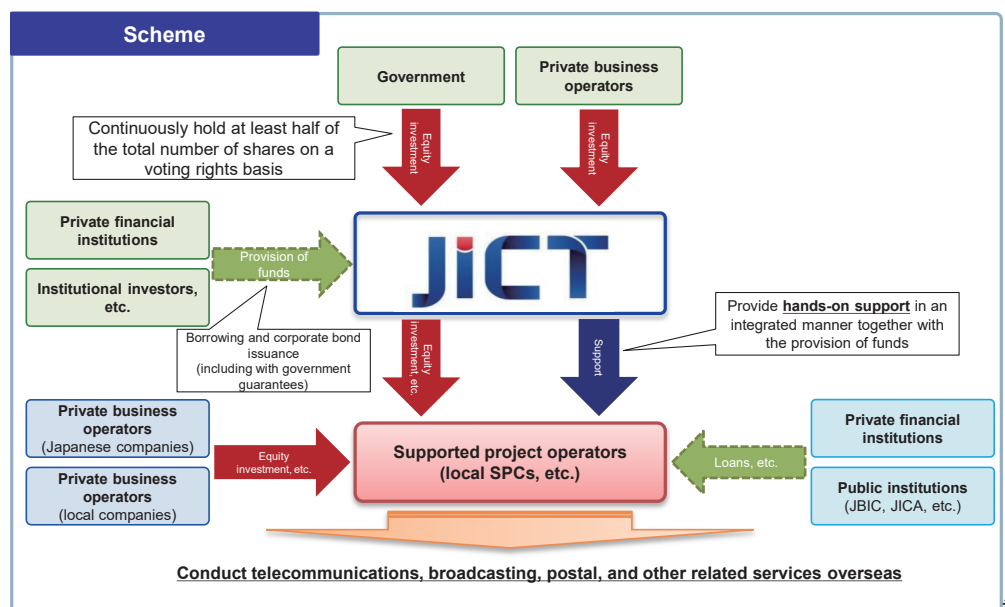
(2) Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (JICT)

The Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (JICT), a public-private fund under the jurisdiction of the MIC, provides investment and hands-on support to those conducting or supporting communication, broadcasting, and postal services overseas (Figure 2-2-8-2). As of the end of March 2025, the JICT has decided to support investments and loans in a cumulative total of approximately 153.5 billion yen.

Furthermore, considering the recent developments in ICT, the needs, and the policy trends of various coun-

tries, the support criteria of the JICT were revised in February 2022 (Ministry of Internal Affairs and Communications Notification No. 34 of 2022). This revision allows the JICT to support projects that do not involve the construction of physical infrastructure (ICT service projects) and to make LP investments in funds. This has made it easier to support the overseas expansion of not only large enterprises but also medium-sized, small, and regional companies. As a result, the JICT decided to give new financial support to five entities.

Figure 2-2-8-2 Support through the Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (JICT)



(3) Initiatives towards overseas expansion in each area

A Core communication infrastructure

Regarding mobile communication networks, in 2021, the Ethiopian government approved the granting of licenses to an international consortium, including Japanese companies, for the country's mobile phone business, and commercial communication services commenced in October 2022. This provides Japan with

an opportunity to promote the expansion of digital solutions in Ethiopia and the African region.

In the area of submarine optical cables, the JICT is supporting submarine optical cable projects in Southeast Asia, with a total project cost of approximately 400 million dollars, including support decisions for up to 78

million dollars in investment. Furthermore, Japan participated in a submarine optical cable installation project in the Indian Ocean region announced by Prime Minister Modi of India in August 2020, with Japanese companies starting to participate in the project in September 2021, and this project was completed in July 2023. Efforts are also being made to improve communication environments in Pacific Island countries with the cooperation of willing countries and relevant ministries and agencies. Additionally, Japan signed a memorandum of cooperation with the European Commission for the establishment of safe, resilient, and sustainable global submarine cable connectivity³ in July 2023.

Regarding 5G, as the importance of safe and secure 5G networks is discussed internationally, efforts are being made to deploy “Open RAN,” which is gaining attention as a technology to realize open and secure networks as well as systems that utilize it for overseas expansion. For example, surveys on the potential for Open RAN deployment were conducted in Vietnam and the Philippines in FY2022, and in Australia and Indonesia in FY2023. In the Philippines, based on the results of the survey conducted in FY2022, a demonstration experiment was conducted in FY2023 to verify the usefulness of Open RAN devices. Subsequently in FY2024, another demonstration was carried out for a field trial. Also, in the U.K., the test environment for Open RAN was established and the conformance of RAN devices to the inter-

face specifications defined by the O-RAN Alliance was tested in FY2022. Moreover, in FY2024, a demonstration experiment was conducted locally in Cambodia for the adoption of Japan’s Open RAN devices in the country. Furthermore, a field test and survey on the effectiveness of 5G/Open RAN communication networks and a survey for the field demonstration of flexible communication terminal architecture for Beyond 5G/6G were conducted in India in FY2024.

Regarding data centers, since March 2021, Japanese companies have been participating in projects aimed at improving the telecommunications environment in Uzbekistan, including the development of data centers and other telecommunications infrastructure. Additionally, through the JICT, the MIC has been supporting the development and operation of data centers in India, with a decision made in October 2022 to provide funding of up to 86 million dollars (and another decision made in May 2024 to provide additional funding of up to 91.2 million dollars).

The Japanese Digital Terrestrial TV Broadcasting System (ISDB-T System) has been adopted by 20 countries, primarily in Central and South America. In October 2022, Botswana completed the transition to digital broadcasting nationwide, becoming the first country outside Japan to do so. Costa Rica and Chile also completed the transition in January 2023 and April 2024, respectively. The MIC will continue to give support for smooth transitions to digital broadcasting.

B Utilization models for digital technology

Regarding the utilization of digital technology in the medical field, Japanese companies have been winning contracts for smartphone-based telemedicine systems, primarily in the Central and South American region. Since FY2020, the MIC has been working on the dissemination and deployment of endoscopes developed by using high-definition imaging technology and AI-based diagnostic support systems to Southeast and Southwest Asian countries. This effort includes conducting demon-

strations in local hospitals.

For the utilization of digital technology for traffic infrastructure, demonstration experiments were conducted on expressways and airports in Thailand in FY2024, in which Japanese infrastructure maintenance and management systems were used to centrally manage ground and underground information by using three-dimensional image information captured by in-vehicle equipment and other devices.

C Broadcasting content

In order to increase the overseas sales revenue related to broadcast content by 1.5 times by FY2025 compared with FY2020, the MIC will continue to support the measures implemented by broadcasting companies and others by organizing seminars and other events at relevant international fairs, including TIFFCOM (in Japan),

AFT (in Singapore) and MIPCOM (in France). Also, in FY2025, the MIC will start implementing new measures to support the creation of live-action content using advanced equipment and to promote overseas distribution of the content in cooperation with domestic content distributors.

D Other areas

(A) Fire prevention

Since the signing of the “Memorandum of Cooperation in the Field of Firefighting between the Minister for Internal Affairs and Communications of Japan and the Ministry of Public Security of the Socialist Republic of Vietnam” on October 8, 2018, the MIC has been highlighting the high quality of Japanese firefighting equipment through exchanges of opinions on preventive policies and stan-

dards for firefighting equipment. Additionally, during the period from February to March 2025, the MIC conducted advanced training on fire prevention technology. Moving forward, the ministry will continue to engage with Vietnam and other Southeast Asian countries to promote the overseas expansion of firefighting equipment that meets Japanese standards.

³ https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000155.html

(B) Postal service

Targeting mainly emerging and developing countries in Southeast Asia, Europe, and the Caucasus region, the MIC is promoting the overseas expansion of the Japanese postal infrastructure system through a public-private partnership. This involves understanding the chal-

lenges and needs related to improving the quality of postal services and optimizing postal operations, and providing Japanese expertise, experience, technology, and systems to address and meet these needs.⁴

(C) Administrative consultation

In the field of administrative consultation, the MIC has been collaborating and cooperating with public ombudsmen from various countries. The ministry has signed memorandums of cooperation on administrative complaint resolution with four countries: Vietnam, Uz-

bekistan, Iran, and Thailand. Based on these agreements, the MIC has implemented initiatives such as accepting a total of approximately 310 trainees from Vietnam.

3. Contribution to formulation of international rules on the digital economy

(1) Data Free Flow with Trust (DFFT)

Regarding Data Free Flow with Trust (DFFT), an international framework for the realization of DFFT (Institutional Arrangement for Partnership: IAP) was agreed upon at the G7 Digital and Technology Ministers' Meet-

ing held in Takasaki, Gunma in April 2023. Subsequently, the establishment of the IAP was approved at the G7 Summit held in May, and the IAP was established under the OECD in December of the same year.

(2) Response to discussions on international rules in cyberspace**A Formulation of international rules in cyberspace**

The MIC attributes importance to two points in the formulation of international rules in cyberspace: (1) full consideration to the free flow of information, which not only supports democracy but also serves as a source of innovation and an engine for economic growth; and (2) the necessity of a multi-stakeholder framework that includes the participation of all the related stakeholders such as companies in the private sector, academia, and civil society, who actually use and manage the internet, to ensure sufficient cybersecurity. Based on these

points, the ministry has been addressing related topics in bilateral dialogues such as the U.S.-Japan Dialogue on Digital Economy (the U.S.-Japan DDE) and strengthening cooperation with like-minded countries. Additionally, in April 2022, Japan, the U.S., Australia, Canada, the EU, and the UK, along with other willing countries, launched the "Declaration for the Future of the Internet," and the MIC has actively participated in discussions at multilateral meetings.

B Bilateral and multilateral dialogues on cybersecurity

Regarding bilateral government discussions on cybersecurity, the "9th Japan-US Cyber Dialogue"⁵ was held in June 2024, followed by the "8th Japan-UK Cyber Dialogue"⁶ in September 2024 and the "6th Japan-EU Cyber Dialogue"⁷ in November 2024. These dialogues included discussions on situational awareness, initiatives in both countries or those implemented between Japan and the EU, international cooperation, and capacity-building support, helping Japan strengthen cooperation with various countries.

In terms of multilateral discussions on cybersecurity,

the ASEAN-Japan Cybersecurity Policy Meeting has been a platform for exchanging opinions and information on the status of initiatives in each country and capacity-building support for the ASEAN region. Additionally, under the framework of the so-called Quad (Japan, the U.S., Australia, and India), cooperation on cybersecurity has been agreed upon, and discussions aimed at strengthening cooperation within the Quad countries have been conducted. The "Quad Cybersecurity Partnership: Joint Principles"⁸ was announced in the joint statement of the Quad Leaders' Meeting in May 2022.

(3) Promotion of trade liberalization in the ICT sector

From the perspective of complementing the multilateral free trade system centered around the World Trade Organization (WTO) and promoting bilateral economic partnerships, Japan is actively working on concluding Economic Partnership Agreements (EPA) and Free Trade Agreements (FTA).

For example, since 2018, Japan has discussed and reached the signing and enforcement of several agreements, including the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the Japan-EU Economic Partnership Agreement (Japan-EU EPA), the Japan-US Digital Trade Agreement, the Japan-

⁴ For specific measures, refer to (2) "Support for overseas deployment of Japanese postal infrastructure" in Section 9. 3, Chapter 2, Part II.

⁵ https://www.mofa.go.jp/press/release/pressite_000001_00394.html

⁶ https://www.mofa.go.jp/press/release/pressite_000001_00588.html

⁷ https://www.mofa.go.jp/press/release/pressite_000001_00728.html

⁸ <https://www.mofa.go.jp/files/100347801.pdf>

UK Comprehensive Economic Partnership Agreement (Japan-UK EPA), and the Regional Comprehensive Economic Partnership (RCEP). Additionally, negotiations for the Japan-UAE EPA are ongoing. In all EPA negotiations, Japan aims to achieve liberalization commitments exceeding WTO standards in the telecommunications

(4) Promotion of strategic international standardization

International standardization in the information and communication sector is a crucial policy issue that leads to the creation of global markets through the unification of standards. Securing strategic initiatives in the formulation of international standards is extremely important from the perspective of enhancing Japan's international competitiveness. Based on this recognition, the MIC is strategically promoting international standardization activities.

Specifically, the ministry is conducting trend surveys on de jure standards in the information and communication field⁹ and on forum standards, which have been increasing their presence¹⁰, fostering the development of personnel versed in international standardization, and implementing initiatives to deepen understanding of the roles and effects of standardization activities.

In FY2024, initiatives to enhance the human resources foundation to support the continuous promotion of

sector, by demanding the removal or relaxation of foreign investment restrictions, negotiating the establishment of competition-promoting regulations such as interconnection rules, and holding discussions on cooperation among the signatory countries.

international standardization activities were started by the effective use of the Cabinet Office's Standard Utilization Acceleration Support Program. Specifically, the MIC is developing training curriculum based on a set of roles, knowledge and skills required of talent engaged in standardization (formulation of rules) in the information communication and digital fields. Also, the ministry is designing and building a business model related to educational programs to encourage companies in the private sector to make practical and effective use of relevant educational programs and popularize them. In addition, in consideration of the importance of developing managers who can lead discussions on international standardization and of increasing the number of people engaged in standardization, the MIC started to implement measures to support promising personnel in conducting international standardization activities.

4. Economic security in the digital field

In view of the importance of economic security in the communication field, such as 5G, initiatives have been undertaken in the digital field. For example, the "Global Digital Connectivity Partnership" (GDGP) was launched in April 2021 following the Japan-U.S. summit, and the "Cooperation Memorandum on 5G Supplier Diversification and Open RAN" was signed at the Japan-U.S.-Australia-India (Quad) summit in May 2022. Building on these, in May 2023 at the Japan-U.S.-Australia-India summit, an "Open RAN Security Report" was released. Furthermore, the Global Coalition on Telecommunications (GCOT)¹¹, which was launched by Japan, the U.K., Australia, Canada and the U.S. in October 2023, released an outcome document on the Open RAN and AI¹² in January 2025. Japan has been making these efforts to ensure the safety and reliability of

global digital infrastructure in collaboration with the U.S. and other like-minded countries.

Furthermore, under the Act on the Promotion of Ensuring National Security through Integrated Implementation of Economic Measures established in 2022, four systems were created. Among these, under the system related to "Ensuring the Stable Provision of Specific Social Infrastructure Services," the establishment of the cabinet order and the ministerial ordinance¹³ was completed in November 2023. Under this system, specific operators in the telecommunications, broadcasting, and postal sectors that meet the designated criteria have been designated. The operation of this system commenced in May 2024.

5. International cooperation in multilateral frameworks

The MIC actively leads international cooperation efforts in the ICT sector through policy discussions within multilateral frameworks such as G7/G20, APEC, APT, ASEAN, ITU, the United Nations, WTO, and OECD. These efforts aim to promote the free flow of informa-

tion, ensure a safe and secure cyberspace, develop high-quality ICT infrastructure, and contribute to the achievement of the United Nations Sustainable Development Goals (SDGs).

⁹ Standards formulated by official international standardization organizations such as the International Telecommunication Union (ITU)

¹⁰ Standards formulated through consensus among multiple companies, universities, and other stakeholders

¹¹ https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000163.html

¹² https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000185.html

¹³ "Cabinet Order of the Act on the Promotion of Ensuring Security by Taking Integrated Economic Measures" and "Ordinance of the Minister for Internal Affairs and Communications on Specified Social Infrastructure Operators Based on the Act on the Promotion of Ensuring Security by Taking Integrated Economic Measures"

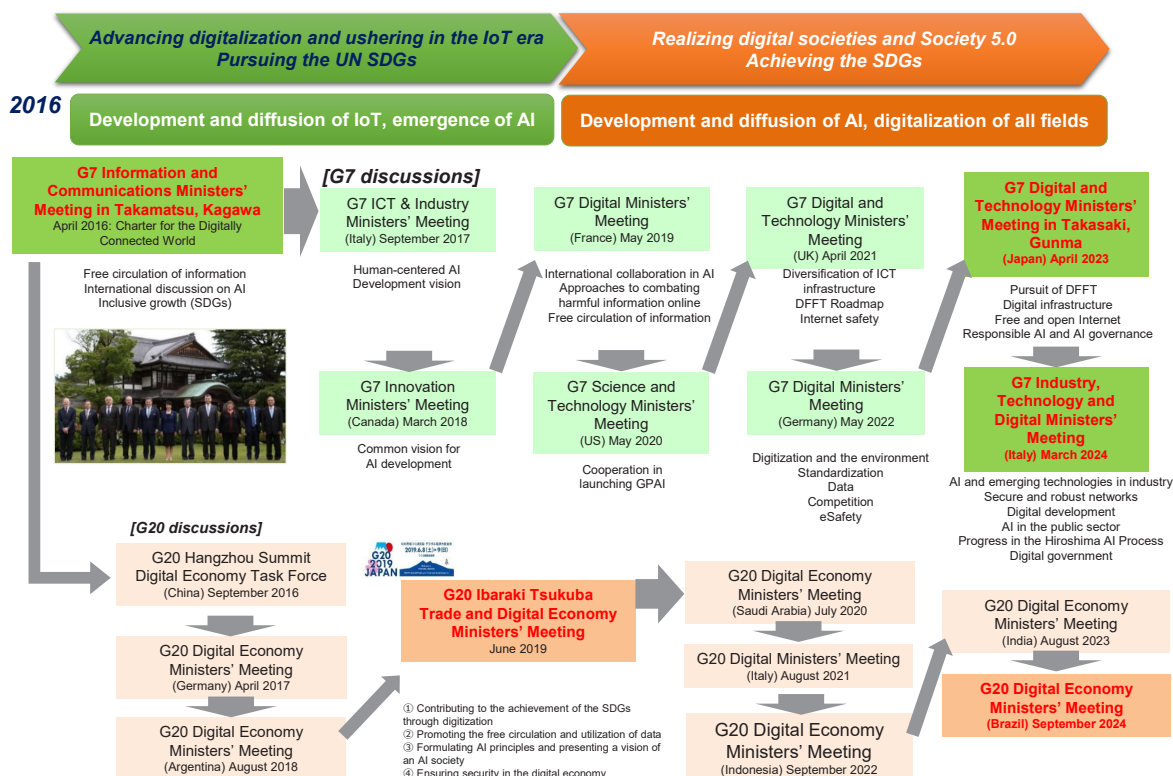
(1) G7/G20

Within the G7 framework, active discussions on policies for the development of the digital economy have been ongoing since the G7 ICT Ministers' Meeting was held in Takamatsu, Kagawa in April 2016.

Similarly, within the G20 framework, which includes countries like China and India, continuous discussions on the digital economy have been taking place. Specifically, at the "G20 Ministerial Meeting on Trade and Digital Economy in Tsukuba, Ibaraki" held in Tsukuba, Ibaraki Prefecture, in June 2019, the G20 agreed for the

first time on AI principles based on a "human-centered" approach. These principles were also endorsed at the G20 Osaka Summit at the leaders' level. The concept of promoting the Data Free Flow with Trust (DFFT) was also supported at the leaders' level and its importance was reaffirmed at the G20 Digital Economy Ministers' Meeting (Saudi Arabia) in 2020. Subsequently, the importance of the concept was reaffirmed again in G20 Rio de Janeiro Leaders' Declaration in 2024 and other related discussions (Figure 2-2-8-3).

Figure 2-2-8-3 Overview of discussion on ICT and digital policy in G7/G20



(2) Hiroshima AI Process

In light of the rapid development and widespread adoption of generative AI, which is becoming a significant issue for the international community, the "Hiroshima AI Process"¹⁴ was established to discuss international governance concerning generative AI. This process involved intensive discussions among G7 members starting in May 2023, culminating in the "G7 Hiroshima AI Process Digital and Tech Ministers' Meeting" in September of the same year, where an interim report was compiled. Subsequently, another G7 Digital and Tech Ministers' Meeting was held in December 2023, under Japan's G7 presidency, to finalize the "Hiroshima AI Process Comprehensive Policy Framework,"¹⁵ the first international policy framework concerning the development and use of advanced AI systems like generative AI. Additionally, the "Work Plan to Advance Hiro-

shima AI Process" was formulated, outlining future G7 initiatives. These outcomes were endorsed in the G7 Leaders' Statement issued in the same month. Based on this work plan, Italy, the G7 chair for 2024, expressed its commitment to continuing the "Hiroshima AI Process." In the "G7 Industrial, Technology, and Digital Ministerial Declaration" adopted in March, the countries agreed to develop and introduce a Reporting Framework to encourage AI developers to voluntarily make and release reports about the status of their compliance with the Hiroshima AI Process International Code of Conduct, thereby fostering transparency and accountability in generative AI development. Subsequently, in December, following discussions by G7, the countries reached an agreement on the basic implementation method of the Reporting Framework and on the final draft of the ques-

¹⁴ Hiroshima AI Process: <https://www.soumu.go.jp/hiroshimaaiprocess/>

¹⁵ This policy framework consists of four components: the "OECD Report Towards a Common Understanding of Generative AI by the G7," the "Hiroshima Process International Guidelines for All AI Stakeholders and Organizations Developing Advanced AI Systems," the "Hiroshima Process International Code of Conduct for Organizations Developing Advanced AI Systems," and "Project-Based Cooperation."

tionnaire form, and in February 2025, the Reporting Framework started to be implemented officially. In April 2025, 19 organizations, including seven Japanese companies, submitted their first responses, which were disclosed on the OECD's website.

At the OECD Ministerial Council Meeting held in May 2024, a side event titled “Towards Safe, Secure, and Trustworthy AI: Promoting Inclusive Global AI Governance” was held. Prime Minister Kishida (then) announced the establishment of the “Hiroshima AI Pro-

cess Friends Group,” a voluntary framework of countries supporting the spirit of the Hiroshima AI Process, with participation from 49 countries and regions. Since then, meetings continued to be held online to exchange information. The first in-person meeting was held in February 2025 to further foster the Hiroshima AI Process and strengthen collaboration among countries participating in the Friends Group for ongoing discussions on AI governance in the international community.

(3) Asia-Pacific Economic Cooperation (APEC)

The Asia-Pacific Economic Cooperation (APEC) is an economic cooperation framework aimed at sustainable development in the Asia-Pacific region, involving major countries and regions within the area. Discussions on telecommunications are primarily conducted through the Telecommunications and Information Working Group (TEL) and the Ministerial Meeting on Telecommunications and Information Industry (TELMIN).

Following the adoption of the “Aotearoa Plan of Ac-

tion” at the 2021 APEC Leaders’ Meeting, TEL is currently examining the implementation of “Innovation and Digitalization,” one of the economic drivers highlighted in the action plan.

The MIC actively contributes to TEL’s operations by participating in its discussions at TEL held twice a year, and at TELMIN fostering a project for the solution of aging society-related social issues by the use of ICT, and introducing ICT policies implemented in Japan.

(4) Asia-Pacific Telecommunity (APT)

The Asia-Pacific Telecommunity (APT) is an international organization in the Asia-Pacific region established in 1979, focusing on balanced development in telecommunications and information infrastructure. It aims to foster the development of human resources through training and seminars and coordinate regional policies on standardization and wireless communications. Since 2021, Mr. KONDO Katsunori from the MIC has been serving as the Secretary-General.

The MIC supports APT activities through contributions, facilitating training programs, and promoting exchanges among ICT engineers and researchers in areas where Japan excels, such as broadband, wireless communications and cybersecurity. In FY2024, support was

provided for nine training sessions, three international joint R&D projects, and one pilot project.

The APT holds a ministerial meeting once in around five years, with the participation of ministers and those in similar positions from APT members. At this meeting, participating ministers decide on the direction of future measures for the enhancement of regional cooperation toward the development of the ICT field in the Asia-Pacific region and announce it in the form of a statement. In May 2025, the Asia-Pacific Telecommunity Ministerial Meeting was held in Tokyo, and the Tokyo Statement¹⁶ was unanimously adopted as a vision to foster sustainable, inclusive and equitable digital transformation (DX) in the Asia-Pacific region.

(5) Association of South-East Asian Nations (ASEAN)

The Association of South - East Asian Nations (ASEAN) is a regional cooperation organization comprising ten Southeast Asian countries. Its main objectives are to promote economic growth, social and cultural develop-

ment, ensure political and economic stability, and foster cooperation on regional issues. Policies in the digital field are discussed at the “ASEAN Digital Ministers’ Meeting (ADGMIN).

A Contribution to achieving the goals of the “ASEAN Digital Masterplan 2025”

To achieve the goals set out in the “ASEAN Digital Masterplan 2025,” formulated in January 2021, Japan annually proposes the “ASEAN-Japan Digital Work Plan” for cooperation and collaboration in the ICT field over the coming year. This plan is implemented with the approval of the ASEAN side. For example, utilizing the

ASEAN-Japan ICT Fund established with contributions from Japan, various joint projects with ASEAN countries are carried out. In FY2024, the “Workshop for Regional CERT Cooperation and Cybersecurity Standards in ASEAN” was held for Japan and ASEAN countries to exchange information and views on cybersecurity.

B Strengthening cooperation in the field of cybersecurity

Currently, the ASEAN-Japan Cybersecurity Capacity Building Centre (AJCCBC)¹⁷ continuously conducts practical cybersecurity defense exercises (CYDER) and other cybersecurity exercises, both online and in-per-

son, for cybersecurity personnel from government agencies and critical infrastructure operators in ASEAN countries. Activities have started to be conducted under a new project framework since 2023 and will be contin-

¹⁶ https://apt.int/sites/default/files/file_tag/2025/05/APT-MM_2025-Tokyo_Statement_for_press_1.pdf

¹⁷ <https://ajccbc.ncsa.or.th/>

ued until 2027, with efforts to enhance exercise content.

Additionally, the MIC regularly holds ASEAN-Japan Information Security Workshops for ISP operators in ASEAN countries to promote information sharing and strengthen cooperation frameworks among stakehold-

(6) International Telecommunication Union (ITU)

The International Telecommunication Union (ITU) (headquartered in Geneva, Switzerland) is a specialized agency of the United Nations (UN) with 194 member countries and regions. Its mission is to promote international cooperation for the improvement and rational use of telecommunications, enhance the efficiency of telecommunications operations, and promote the development and efficient operation of technical means to increase the use and dissemination of telecommunications. The ITU is composed of the following three sectors, which engage in activities such as frequency allocation, telecommunication technology standardization, and

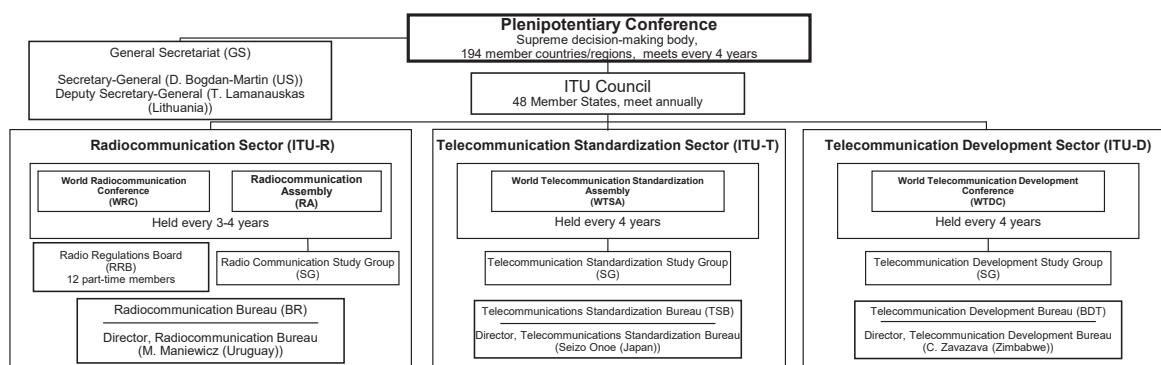
ers. A meeting was held in March 2025 to maintain and develop cooperative and collaborative relationships in the field of cybersecurity between Japan and ASEAN countries.

support for the development of telecommunications in developing countries (Figure 2-2-8-4).

- (1) Radiocommunication Sector (ITU-R)
- (2) Telecommunication Standardization Sector (ITU-T)
- (3) Telecommunication Development Sector (ITU-D)

In September 2022, elections were held at the Plenipotentiary Conference, and Mr. ONOE Seizo from Japan (former Chief Standardization Strategy Officer of Nippon Telegraph and Telephone Corporation) was elected as the Director of the Telecommunication Standardization Bureau. He assumed office in January 2023 (the term is four years, with a maximum of two terms).

Figure 2-2-8-4 Organizations in ITU



A Initiatives in ITU-R

In ITU-R, activities are conducted to ensure the effective, efficient, economical, and fair use of radio frequencies by all radiocommunication services. This includes conducting studies on frequency usage and developing standards related to radiocommunication.

Among these activities, the Radiocommunication Assembly (RA), which approves draft recommendations submitted by various Study Groups (SGs) and deliberates on issues and organizational structures for the next study period, and the World Radiocommunication Conferences (WRC), which aim to revise the Radio Regulations governing international frequency allocation, are the largest meetings held by ITU-R every three to four years. The MIC has actively contributed to these discussions.

At RA-23, held in Dubai, the UAE, in November 2023, new draft recommendations, including those providing an overall picture of the capabilities and use cases required for the development of specifications for the next-generation mobile phone systems expected to

be realized around 2030, were approved.

Furthermore, at WRC-23, held from November to December of 2023, participants agreed on the expansion of the frequency bands for International Mobile Telecommunication (IMT) and the securing of a frequency band for high-altitude platform stations (HAPSS) to serve as base stations for IMT. Deliberations were made also on the agenda for WRC-27, which is slated to be held in 2027, and participants agreed to discuss frequency allocation for mobile phone-satellite direct communication, the moon surface and lunar orbit, and space weather sensors.

For the next study period (2024 to 2027), Mr. KONO Takahiro (SKY Perfect JSAT), Mr. IMATA Satoshi (KDDI) and Mr. OIDE Satoshi (NHK) were appointed vice-chair of SG 4 (satellite services), SG 5 (terrestrial services) and SG 6 (broadcasting services), respectively. Also, Mr. KAWAI Nobuyuki (KDDI) was selected to be the chair of the APT Conference Preparatory Group for WRC-27 (APG-27).

B Initiatives in ITU-T

ITU-T conducts technical studies necessary for the formulation of international standards related to communication network technologies and operational meth-

ods.

The World Telecommunication Standardization Assembly (WTSA), the highest decision-making meeting

of ITU-T, is held every four years. In October 2024, WTSA-24 was held in New Delhi in India. At WTSA-24, integration of Study Groups (SG 9 and SG 16) was agreed for the first time in 16 years by ITU-T, which had been discussed in light of the proposal made by Japan at the meeting of the Telecommunication Standardization Advisory Group (TSAG) held in January 2024.

C Initiatives in ITU-D

ITU-D provides support for the development of the information and communication technology (ICT) sector in developing countries. The World Telecommunication Development Conference (WTDC), the highest decision-making meeting of ITU-D, is held every four years, and the next WTDC-25 is slated to be held in Baku, Azerbaijan from November 17 to 28, 2025. During the current study period (2022-2025), activities such as discussions by the Study Groups (SGs) at biannual meetings, the implementation of ICT development support projects and ICT talent development are being pro-

(7) United Nations

A Global Digital Compact (GDC)

In “Our Common Agenda,” which was presented by United Nations Secretary-General Guterres in September 2021, an expectation was expressed for common principles on “an open, free and secure digital future for all,” and subsequently in September 2023, it was proposed that an agreement be reached on the Global Digital Compact (GDC) at the Summit of the Future to be held in 2024. Then, the GDC was adopted (on Septem-

B Internet Governance Forum (IGF)

The Internet Governance Forum (IGF) is one of the most important international conferences in the field of Internet policy, where governments, private sector, technical and academic communities, and civil society engage in dialogue on various public policy issues related to the Internet on an equal footing.

In October 2023, Japan hosted the 18th IGF meeting at the Kyoto International Conference Center in Kyoto, with what was then a record number of over 6,000 local participants and approximately 10,000 participants in total, including online attendees. During the opening ceremony, Prime Minister Kishida (at the time) emphasized the importance of the Internet as the foundation of democratic society and expressed strong support and commitment to “multi-stakeholder approach discussions” to maximize the benefits of the Internet and address its negative aspects.

Additionally, during a special AI session following the opening ceremony, Japan shared the Hiroshima AI Process, which Japan leads, with the international community. In his keynote speech, Prime Minister Kishida (at the time) emphasized the importance of leading international rule-making to ensure that the entire international community, including the Global South, can enjoy the benefits of trustworthy, safe and secure generative AI

TSAG is an organization that advises on WTSA resolutions and the standardization activities of various ITU-T Study Groups (SGs). Following the agreement, SG 21 was newly established. Also, at the assembly, new resolutions on AI, the metaverse and others were approved, and leaders for the SGs were appointed.

moted based on the strategic goals and action plans adopted at WTDC-22 held in Kigali, Rwanda in June 2022¹⁸.

In cooperation with the ITU, the MIC has been implementing a range of projects including the Connect2Recover initiative to enhance digital infrastructure and resilience, the Innovation and Entrepreneurship Alliance to give technical support and entrepreneurship support and projects to increase the resilience of ICT infrastructure and develop cybersecurity talent in the Asia-Pacific region.

ber 22, 2024) as an annex to the outcome document “Pact for the Future” of the Summit of the Future held in 2024.

The GDC sets five objectives while showing the principles on inclusiveness, development-oriented approach and multistakeholderism. The five objectives include closing digital divides and enhancing international governance of AI.

and achieve further economic growth and improvements in living environments. Furthermore, Minister for Internal Affairs and Communications Suzuki (at the time) introduced the status of discussions on “International Guiding Principles and Code of Conduct for AI Developers” and expressed the intention to continue seeking opinions from various stakeholders. Through this session, voices of support and expectations for the Hiroshima AI Process were received from panelists representing multi-stakeholders, including governments, industries, international organizations, and academia from countries beyond the G7.

Furthermore, an exhibition area called the “IGF Village” was set up during the IGF meeting, with 72 companies and organizations from around the world participating in the exhibition. From Japan, 25 companies and organizations, including telecommunications companies and research institutions, showcased remote robots and measures against manga piracy, actively promoting Japan’s technological capabilities and initiatives through interactions with participants from various countries who visited the booths.

In December 2024, the 19th IGF meeting was held in Saudi Arabia, and Japan hosted a session on Internet governance and AI and participated in high-level ses-

¹⁸ The event, originally scheduled to be held in 2021, was postponed by one year due to the global spread of the COVID-19.

sions to share the importance of the multistakeholder approach, thereby proactively contributing to the meet-

(8) World Trade Organization (WTO)

The progress of the negotiations in the field of telecommunications at the WTO has not been observed since the basic telecommunications negotiations reached an agreement in 1997, due to the stagnation of the Doha Round negotiations that began in 2001. However, in light of increasing attention to electronic commerce, which handles data flows on the Internet, a group of like-minded countries initiated electronic com-

(9) Organization for Economic Co-operation and Development (OECD)

The Digital Policy Committee (DPC) of the Organization for Economic Co-operation and Development (OECD) has been conducting pioneering discussions in the field of ICT. The MIC actively contributes to policy discussions at the OECD by providing personnel and financial support to the OECD Secretariat, as well as having its officials appointed as the chair of the DPC (from January 2020) and vice-chairs of various working groups.

The DPC has been working on initiatives related to AI since 2016, outlining principles that those involved in AI should share and the issues that governments should address. In May 2019, the first intergovernmental agreement on AI, the “Recommendation of the Council on Artificial Intelligence,” was adopted and made public. Subsequently, proactive initiatives have been undertaken,

(10) GPAI

The Global Partnership on Artificial Intelligence (GPAI) is an international public-private partnership organization established to realize the development and utilization of “Responsible AI” based on a human-centric approach. The launch of GPAI was proposed at the Biarritz Summit (France) in 2019, and after participants in the G7 Science and Technology Ministers’ Meeting under the U.S. presidency in May 2020 agreed on G7 cooperation for its establishment, it was officially founded in June of the same year with the participation of 14 countries and the EU.

In November 2022, Japan hosted the GPAI Summit 2022 and served as the chair country for one year starting from that month. At the Ministerial Council, under the initiative of Japan as the chair country, the first-ever ministerial declaration at a GPAI Summit was adopted. This declaration included agreements among countries on promoting AI based on human-centric values, opposing the illegal and irresponsible use of AI, and contributing to a sustainable, resilient, and peaceful society.

In December 2023, the GPAI Summit 2023 was held in India, the chair country for 2024, and at the Ministerial Council, it was agreed to support projects aimed at promoting fair access to key resources for AI research and innovation—such as AI computing and high-quality datasets—and to establish the first GPAI Expert Support

ing.

merce negotiations at the WTO in 2019. Subsequently, in 2024, co-convenors (Japan, Australia, and Singapore) issued a joint statement on behalf of countries and regions participating in the negotiations. In the statement, the co-convenors announced that participants had achieved a stabilized text on the Agreement on Electronic Commerce and then published the text.

such as the launch of the online platform “OECD.AI” for AI policy (February 2020) and the establishment of the AI Governance Working Group (AIGO) (May 2022).

In May 2024, the Meeting of the OECD Council at Ministerial Level (MCM) was held in Paris, France, with Japan, celebrating its 60th anniversary as an OECD member, serving as the chair country. Discussions were held in the MCM, taking into account the achievements of the “Hiroshima AI Process,” and the ministerial declaration expressed the support of the OECD member countries for its achievements and their cooperation in advancing practical efforts, as well as the revision of the “Recommendation of the Council on Artificial Intelligence.”

Center in the Asian region in Tokyo.

Furthermore, in July 2024, India held an ad-hoc GPAI mid-year summit as the chair country, where it was decided to enhance GPAI-OECD collaboration through integrated management with the related working groups of the OECD and the integration of GPAI and OECD AI expert communities.

Also, in the same month, the GPAI Tokyo Expert Support Center was established at the National Institute of Information and Communications Technology (NICT). The Center, under the GPAI framework, provides operational and management support for survey and research activities led by GPAI experts, including generative AI-related projects contributing to the promotion of the Hiroshima AI Process.

In December 2024, Serbia hosted the GPAI Summit 2024 as the chair country for 2025. Participants in the summit meeting approved the acceptance of new members (including developing and emerging countries) based on the OECD AI Principles (Recommendation of the Council on Artificial Intelligence I); arrangement of a non-official ministerial meeting on the sidelines of the AI Action Summit to be hosted by France (in February 2025), based on a proposal by France, with the participation of GPAI member candidates; and appointment of Slovakia as the chair country for 2026.

(11) ICANN

For Internet resources such as IP addresses and domain names, which are essential for Internet use, it is crucial to manage and coordinate them globally to prevent duplicate allocations. Currently, the international management and coordination of these Internet resources are carried out by the Internet Corporation for Assigned Names and Numbers (ICANN), a non-profit organization established in 1998. ICANN is responsible for the allocation of IP addresses, coordination of domain names, operation and deployment of the root server system, and the formulation of policies related to these activities.

The MIC actively participates in and contributes to discussions held by ICANN's Governmental Advisory Committee with the participation of national govern-

ments and international organizations. For example, when the Registry Agreement (RA) and the Registrar Accreditation Agreement (RAA) were revised in April 2024, the MIC proposed that the enforcement situation be monitored regularly for the sharing of the results among governments. Also, regarding the domain name system (DNS) abuse¹⁹, the MIC has submitted opinions on proposed amendments to the Registrar Accreditation Agreement (RAA) to be concluded between ICANN and registrars, and has raised the awareness of the need for ongoing discussions within ICANN to prevent illegal activities on the Internet, while leading the relevant sessions in collaboration with the U.S. and the European Commission.

6. International cooperation in bilateral relationships

(1) Policy cooperation with the U.S.

Following the “U.S.-Japan Competitiveness and Resilience (CoRe) Partnership”²⁰ issued after the U.S.-Japan Summit on April 16, 2021, the “Global Digital Connectivity Partnership (GDCP)”²¹ was launched in May of the same year to promote secure connectivity and a vibrant digital economy (Figure 2-2-8-5).

The MIC, in cooperation with relevant ministries and agencies, has been continuously holding the “the U.S.-Japan Dialogue on Digital Economy (the U.S.-Japan DDE)”²² with the U.S. Department of State since 2010. Since the launch of the GDCP, the U.S.-Japan DDE has been positioned as a framework for promoting the GDCP. The MIC is making use of this framework to promote Japan-US cooperation in the digital field.

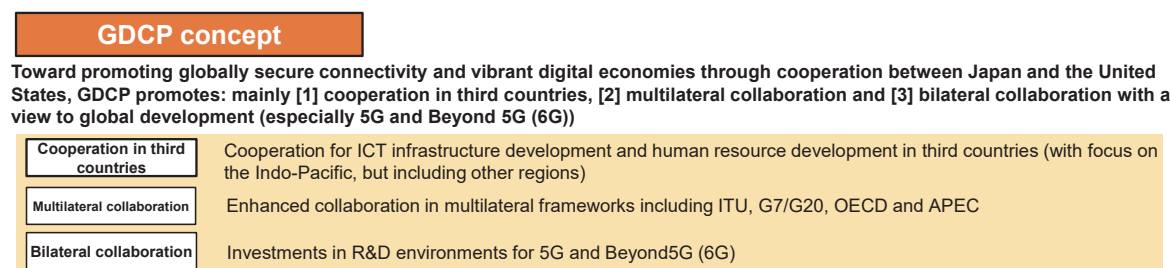
The 14th U.S.-Japan DDE public-private and intergovernmental meetings were held in a hybrid format (both

in-person and online) on February 6 and 7, 2024. During these meetings, a wide range of topics was discussed, including 5G and Beyond 5G (6G), AI governance, Cross-Border Privacy Rules (CBPR), cooperation on government access, international cooperation, and cooperation within the United Nations. As a result of these discussions, a “Joint Statement from the 14th U.S.-Japan Dialogue on Digital Economy” was published²³.

In October 2024, the 9th GDCP Expert-Level Working Group was held, where opinions were exchanged on further promoting the U.S.-Japan cooperation with third countries.

At the U.S.-Japan Summit held in February 2025, a joint statement by the leaders was published²⁴, confirming further collaboration between the U.S. and Japan in AI and in third-country cooperation on Open RAN.

Figure 2-2-8-5 Global Digital Connectivity Partnership (GDCP)



(2) Cooperation with Europe

A Cooperation with the European Union (EU)

The MIC has been holding the “Japan-EU ICT Policy Dialogue” as a platform for exchanging information and opinions on ICT policies with the Directorate-General

for Communications Networks, Content and Technology of the European Commission. During the 30th Japan-EU ICT Policy Dialogue held in March 2025, discussions

¹⁹ Distribution of malware, botnet spreading and phishing using the DNS. According to ICANN, for the purposes of the RA and the RAA, DNS abuse means malware, botnets, phishing, pharming and spam (when spam is used as a delivery mechanism for any of other four types of DNS Abuse). Issues related to piracy websites and child pornography may be discussed under the same framework.

²⁰ https://www.mofa.go.jp/mofaj/na/na1/us/page1_000951.html

²¹ https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000119.html

²² In the joint statement issued at the “13th the U.S.-Japan Policy Cooperation Dialogue on the Internet Economy” held on March 6 and 7, 2023, it was decided to rename the meeting to the “U.S.-Japan Dialogue on Digital Economy.”

²³ https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000172.html

²⁴ https://www.mofa.go.jp/mofaj/na/na1/us/pageit_000001_01583.html

were held on topics such as 5G/Beyond 5G (6G), submarine cables, digital infrastructure including data centers, AI, online platforms, quantum technology and cybersecurity.

Furthermore, in May 2022, the Japan-EU Digital Partnership was established at the Japan-EU Summit held in May 2022. On the Japanese side, the MIC, the Digital Agency and the Ministry of Economy, Trade and Industry are the main participants, while on the EU side, the Directorate-General for Communications Networks, Content and Technology of the European Commission takes the lead for Japan-EU cooperation in the digital

B Bilateral cooperation with European countries

(A) U.K.

In December, 2022, the MIC, the Digital Agency, and the Ministry of Economy, Trade and Industry of Japan and the Department for Science, Innovation and Technology (DSIT) of the United Kingdom launched the “UK-Japan Digital Partnership” as a ministerial-level framework, upgrading the previous director general-level framework, with the aim of addressing priority issues at a higher level. Based on this partnership, Japan has been implementing a range of measures in the digital field in cooperation with the United Kingdom.

In 2024, the two countries enhanced bilateral cooperation for the future of telecommunications and diversification. In November of the same year, under the Global Business Innovation Program (GBIP) implemented by Innovate UK, representatives of tech companies engaged in R&D in the digital field were dispatched to Japan to interact with their counterparts in Japanese research institutes and companies, with support from the MIC and the National Institute of Information and Com-

munications Technology (NICT). Moreover, the Japan-UK Telecoms Policy Dialogue was held on the sidelines of the event with the participation of the MIC and the NICT from Japan and DSIT and Innovate UK from the United Kingdom. Participants in this meeting exchanged opinions on the promotion of Beyond 5G/6G, further diversification of supply chains through Open RAN, and the standardization of technologies on future networks.

At the third Ministerial Japan-UK Digital Council held in January 2025, participants reviewed how the two sides had cooperated in the examination of R&D initiatives in the Beyond 5G/6G field, enhancement of collaboration through the Hiroshima AI Process Friends Group and in other efforts made under the Japan-UK Digital Partnership. Then, a joint statement²⁵ was made and announced to show a strategic direction towards the next cooperation stage.

(B) Germany

In order to deepen mutual understanding in the policy aspects of the information and communications field and promote cooperation between Japan and Germany in the field, the MIC has been holding the “Japan-Germany ICT Policy Dialogue” with the Federal Ministry for Digital and Transport (BMDV). The 8th meeting was held in November 2024, where discussions on various topics, including initiatives related to Open RAN, progress in research and development towards Beyond 5G, AI, dis-/mis-information and metaverse took place. On the same day, a public-private meeting was also held, and information was exchanged regarding initiatives implemented by the Japanese and German industries for 5G/Open RAN, Beyond 5G, all-photonics network (APN) and oth-

er new communication network technologies. In November 2024, an international digital dialogue meeting was held by BMDV in Berlin, Germany. The MIC participated in the political roundtable meeting and high-level keynote meeting and contributed to discussions regarding connectivity, inclusiveness, digital public infrastructure and other issues.

Furthermore, based on the letter of intent for cooperation related to Beyond 5G/6G and future communication technologies²⁷, the MIC implemented a Japan-Germany international joint R&D project and Japan-Germany Beyond 5G/6G workshops with the Federal Ministry of Research, Technology and Space of Germany (including the latest one held in January 2025 in Sendai).

(C) France

The MIC has been holding the “Japan-France ICT Consultations” with the French Ministry for the Economy, Finance, and Industrial and Digital Sovereignty to facilitate information sharing on important themes in the ICT field. At the 23rd meeting held in December

2024, participants discussed issues about the R&D activities for Beyond 5G/6G, utilization and governance of AI towards the AI Action Summit (held in Paris in February 2025) and digital infrastructure including submarine cables.

²⁵ https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000192.html

²⁶ https://www.soumu.go.jp/menu_news/s-news/01tsushin08_02000186.html

²⁷ https://www.soumu.go.jp/menu_news/s-news/01tsushin04_02000145.html

(3) Cooperation with Asia-Pacific countries

The MIC is cooperating with information and communication authorities of Asia-Pacific countries in the field

A Republic of Korea

In December 2023, the MIC held the “Japan-Korea ICT Policy Dialogue” with the Ministry of Science and ICT of the Republic of Korea. The dialogue was intended for the exchange of views on mutual interests in the field

B India

In May 2022, the MIC and the Ministry of Communications of India held the 7th Japan-India Joint Working Group meeting online to share the progress of initiatives in the field of ICT, such as 5G/Beyond 5G and Open RAN, and exchanged views on future cooperation be-

C Southeast Asian countries

With the Philippines, the MIC signed a memorandum of cooperation for ICT with the Department of Information and Communication Technology of the Philippines in February 2023 and agreed to further strengthen cooperation in the ICT field, including support for the construction of 5G networks including Open RAN. Additionally, during the Japan US-Philippines Summit held in April 2024, a “Joint Vision Statement by Japan, the Philippines, and the United States” was announced, confirming the strengthening of cooperation in the field of information and communication, including cooperation related to Open RAN.

With Indonesia, the building of Open RAN was added as a new area of cooperation to the memorandum of cooperation in the ICT field signed between the MIC and the Ministry of Communication and Informatics in October 2023, and the two sides agreed to further deepen cooperation also for 5G, AI, and big data.

With Cambodia, the MIC exchanged the joint minutes on future bilateral cooperation in the digital field with the Ministry of Post and Telecommunications of Cambodia in December 2023 and agreed to further promote bilateral cooperation for the development of the digital

D Australia

Following a joint statement on telecommunications resilience and security in the Indo-Pacific in July 2022, the “Japan Australia Telecommunications Resilience Policy Dialogue” was established. This framework involves the MIC from Japan, and the Department of Home Affairs and the Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Arts from Australia. Through the dialogue, the two sides will regularly share information and hold discussions on information and communications fields, including Open RAN, 5G, submarine cables, and satellite communications, and consider the implementation of joint projects as needed. Also, through the dialogue, digital connectivity in the Indo-Pacific region will be ensured and improved for the realization of “Free and Open Indo-Pacific” (FOIP).

of ICT, including communication infrastructure development and the utilization of ICT.

of ICT, such as AI and Open RAN, and the two sides agreed to hold dialogue meetings on a regular basis going forward.

tween Japan and India. In August 2023, a sub-group meeting on Open RAN, with the participation of Japanese and Indian companies, was held to exchange information to facilitate specific cooperation.

economy and society.

With Malaysia, the ministry signed a memorandum of cooperation for information and communication fields with the Ministry of Communications and Digital of Malaysia in November 2023 and agreed to further strengthen bilateral cooperation in the fields, including cooperation for 5G security and future advanced networks. In March 2024, the Japan-Malaysia ICT Joint Working Group meeting was held for the two sides to share information about the progress of initiatives in the fields of ICT, broadcasting, and cybersecurity and exchange views on future bilateral cooperation. In conjunction with the working group, the Japan-Malaysia ICT Collaboration Conference was held, providing Japanese and Malaysian companies with an opportunity to introduce their initiatives to both governments, including the latest measures implemented for broadcasting and ICT.

With Vietnam, the MIC signed a memorandum of cooperation in information and communication fields with the Ministry of Information and Communications of Vietnam in August 2024, and the two sides agreed on the promotion of bilateral cooperation in new fields, such as Open RAN.

The third meeting of the Policy Dialogue and the Track 1.5 meeting, in which those from the private sectors of the two countries also participated, were held in April 2025. Participants exchanged information and views on initiatives in the field of information and communications, such as Open RAN, Beyond 5G (6G), submarine cables, cybersecurity, and inter-carrier roaming in emergencies. The two sides agreed to continue collaborating on common policy issues. At the Track 1.5 meeting, participants from companies in the private sectors of the two countries briefed on their businesses in the Indo-Pacific region and discussed the challenges faced on-site in the businesses to reaffirm the need for the public and private sectors to enhance Japan-Australia collaboration.

(4) Cooperation with countries in Central and South America

In Central and South America, the adoption of Japanese Digital Terrestrial TV Broadcasting System (ISDB-T System) was implemented in Brazil in 2006, and since then the scheme has been adopted in 14 countries. Currently, support is provided for efforts towards the cessation of analog broadcasting in each country. Also, Japan helped countries such as El Salvador and Nicaragua to introduce disaster prevention ICT utilizing the Emergency Warning Broadcast System (EWBS), a feature of the Japanese broadcasting scheme.

Furthermore, in order to enhance cooperative relations with Central and South American countries not only in the field of broadcasting, which has traditionally maintained cooperative relations through the adoption of Japan's terrestrial digital broadcasting scheme (ISDB-T), but also in a wider range of ICT fields, the MIC has recently concluded memoranda of cooperation in this field with the Ministry of Technologies of Information and Communication of the Republic of Paraguay and the National Commission of Telecommunications of Paraguay (May 2024), with the Ministry of Science, Innovation, Technology and Telecommunications of the Republic of Costa Rica (August 2024), with the Ministry of Information and Communication Technology of the Re-

public of Colombia (September 2024) and with the Ministry of Communications of the Republic Federal of Brazil (March 2025).

Based on the memoranda of cooperation concluded with each of the countries, the MIC has been pushing ahead with measures to help these countries solve their social issues by utilizing Japan's advanced ICT. As the latest examples, surveys were conducted on the feasibility of introducing Japan's ICT-based early earthquake detection and analysis technologies in Colombia and a demonstration of ICT solutions using Japan's mesh Wi-Fi technology was carried out in Brazil in FY2024.

For U.S.-Japan cooperation with third countries, 5G seminars were held targeting Central and South American countries to explain the importance of building an open and secure 5G network to them. In December 2024, Brazil and the U.S. jointly held an Open RAN symposium, in which the MIC participated to brief on Japan's measures to foster Open RAN. In addition, the MIC is supporting Japanese companies having advanced technologies in the field in expanding their business to Central and South America, and in FY2023, demonstrations were carried out in Peru and Brazil regarding the Open RAN-based 5G environment.

(5) Cooperation with other regions

A Cooperation with Africa

Cooperation in the ICT sector with African countries has progressed, starting with the adoption of Japanese Digital Terrestrial TV Broadcasting System (ISDB-T System) in Botswana (adopted in 2013, fully digitized in October 2022) and Angola (adopted in 2019). In August 2022, the 8th Tokyo International Conference on African Development (TICAD8) was held in Tunisia. The MIC hosted an online seminar and exhibition on digital transformation (DX) as an official side event. In May 2023, a memorandum of cooperation (MoC) in the fields of ICT and postal services was signed with the Ministry of

Communications and Information Technology of Egypt. In February 2024, an MoC in the field of ICT was signed with the Ministry of Information, Communications, and the Digital Economy of Kenya.

Moreover, various demonstration projects have been conducted to address social issues in Africa and support Japanese companies in business expansion in the region. These projects include those implemented in Senegal, Rwanda and other countries for communication infrastructure, agricultural ICT, medical ICT and remote education.

B Cooperation with the Middle East

The MIC has been strengthening its cooperative relationship with Saudi Arabia. Based on the "Japan-Saudi Vision 2030" (2017) and the memorandum of cooperation on ICT signed with the Ministry of Communications and Information Technology of Saudi Arabia (2019), various initiatives have been undertaken. These include dispatching a public-private mission to Saudi Arabia (October 2018), holding ICT public-private workshops (January 2022), and participating in LEAP, the largest technology exhibition in the Middle East, where Japan's booth was established and a public-private work-

shop was held locally by the Japanese side (March 2024). These efforts were made to build cooperative relationships between companies from both countries and support the deployment of Japanese technologies in the region.

Also, taking the opportunity of the 70th anniversary of diplomatic relations with Israel, an MoC in the fields of telecommunications technology and postal services was signed with the Ministry of Communications of Israel in April 2023.

Policy Focus Ensuring Global Economic Security

1. Economic security

According to the “National Security Strategy of Japan” (decided by the Cabinet in December 2022), economic security means to ensure Japan’s national interests, such as peace, security, and economic prosperity, by taking economic measures. In light of the fact that various threats are being posed to Japan through economic means, the Government of Japan aims to execute necessary economic measures to enhance Japan’s self-reliance and secure the advantage and indispensability concerning its technologies and others. In the international context, while working with like-minded countries and in cooperation with the private sector, Japan is expected to contribute to the maintenance and enhancement of the international economic order based on free, fair and equitable rules and implement global measures for co-existence and co-prosperity in the international community, while ensuring the stable supply of important items for the enhancement of supply chains.

The importance of economic security is increasing amid the progress of globalization and the intensification of global competition. For example, as the international economic environment is becoming more complex, the number of cases of “economic coercion,” which means to exploit the relationships of economic dependence between countries for political purposes, is increasing. In order to respond to such coercion, Japan needs to collaborate with like-minded countries and increase its economic self-reliance and the indispensability of its technologies. Specifically, it is necessary for Japan to increase the resilience of its supply chains

through the diversification of supply sources and implement measures for the stable supply of important items and services.

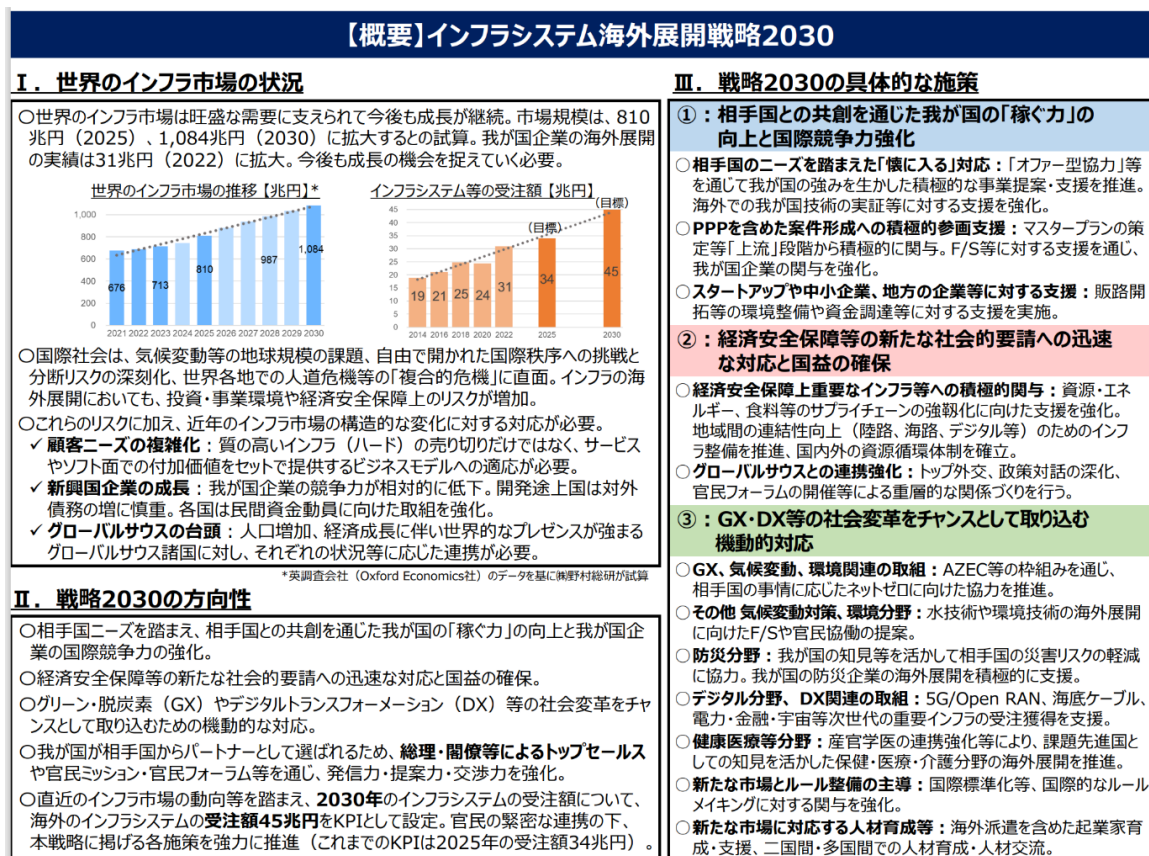
The Government of Japan, via the Ministerial Meeting on Strategy relating to Infrastructure Export and Economic Cooperation, has been promoting the overseas deployment of the infrastructure systems supplied by Japanese companies, focusing on the need to maintain Japan’s economic security and foster its economic growth. In December 2024, the ministerial meeting formulated the “Infrastructure System Overseas Promotion Strategy 2030” (hereinafter, the “Infrastructure Strategy 2030”) for the first time in five years, drastically revising the former version (**Figure 1**).

The Infrastructure Strategy 2030 upholds the following three as strategic pillars:

- (1) Improving Japan’s “earning power” and strengthening international competitiveness through co-creation with partner countries
- (2) Responding quickly to new societal demands such as economic security and ensuring national interests
- (3) Responding flexibly to embrace social changes such as green transformation (GX) and digital transformation (DX)

Based on these pillars, the Government of Japan is implementing comprehensive measures to ensure the country’s economic self-reliance in and outside the country as well as the indispensability of Japanese products and systems.

Figure 1: Overview of the Infrastructure System Overseas Promotion Strategy 2030



(Source) Infrastructure System Overseas Promotion Strategy 2030 (decided by the Ministerial Meeting on Strategy relating to Infrastructure Export and Economic Cooperation in December 2024)¹

2. Importance of economic security in the digital field

The digital field plays a fundamental role in the field of contemporary economic activities. In particular, digital infrastructure is part of the important infrastructure that supports people's daily lives and industrial activities. It is therefore critical for Japan to secure economic security in this field as a precondition to maintain its national competitiveness. However, Japan is facing challenges, such as declining development investments by domestic telecommunications carriers, increasing dependence on foreign vendors, and concerns about the safety, transparency and openness of digital infrastructure, due to the decrease in population and changes in the market environment.

The telecom industry, which supports Japan's digital infrastructure, achieved growth driven by strong domestic demand and increased its international competitive-

ness. Presently, however, companies engaged in the industry are finding it difficult to maintain their competitiveness based on their traditional business models, due to market shrinkage caused by the decrease in population and the emergence of global vendors. On the other hand, demand for AI, propelled by the rapid development of generative AI, is explosively increasing, which in turn is generating special demand for the establishment of safe and highly reliable digital infrastructure to meet the demand, not only in Japan but across the world. Amid this situation, it is necessary for Japanese companies to take advantage of the expanding demand to achieve growth and increase their international competitiveness, while reducing excessive dependence on foreign vendors and eliminating concerns over the economic security.

3. Specific measures in priority areas

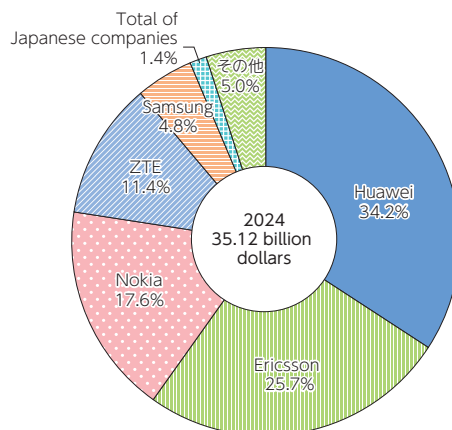
(1) 5G/Open RAN

5G networks are important digital infrastructure that supports people's daily lives and economic activities, and the safety and sustainability of these networks are directly related to Japan's economic security. However, at present, Japanese companies as a whole hold only

about a 2% share in the 5G base station market, which is dominated by foreign companies (Figure 2). This situation is heightening economic coercion and supply chain risks posed to Japan.

¹ <https://www.kantei.go.jp/jp/singi/keikyoku/dai58/siryou1.pdf>

Figure 2: Global macro-cell base station market shares (in terms of shipment value in 2024)

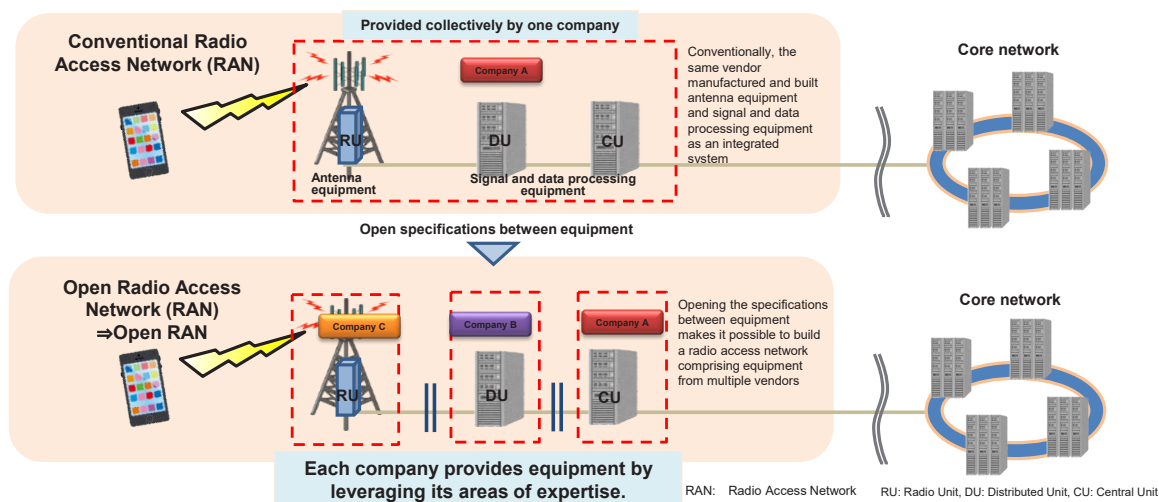


(Source) Omdia

In response, in order to foster the diversification of vendors in the 5G base station market, Japan and other like-minded countries, including the U.S., the U.K., Australia, India and Canada, have been encouraging diverse suppliers to participate in Open RAN for its promotion, which is attracting attention as a technology to ensure network transparency while enhancing supply chain re-

silience, generating innovations including those related to security, and promoting competition in the base station market. The MIC is supporting demonstration projects and business activities under the overseas digital deployment support program, with a view to gaining international understanding about the benefits of Open RAN towards the launch of specific projects.

Figure 3: Overview of Open RAN



Specifically, for collaboration with the U.S. and other like-minded countries for deployment in third countries, the MIC will carry out Open RAN-related field trials in Manila, the Philippines, as agreed at the Japan-U.S.-Philippines Summit meeting, foster collaboration for the launch of spe-

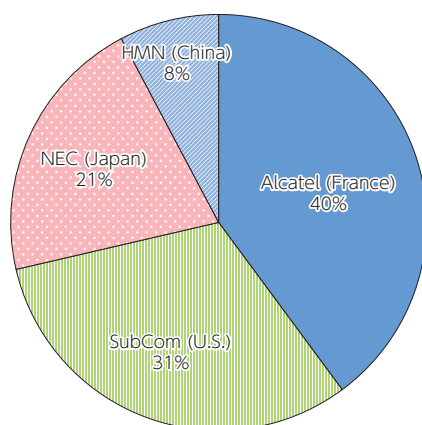
cific cooperation projects between like-minded countries, including providing support for Asia Open RAN Academy, and participate in and host international events with like-minded countries, such as the International Open RAN Symposium.

(2) Submarine cables

As for the world's submarine cable market, unlike the situation regarding 5G base stations, three companies based in developed countries are dominating the market, collectively accounting for 92% of orders received in terms of the cumulative total length of cables installed during the period from 2011 to 2024, with SubCom of the

U.S. holding about 31%, Alcatel Submarine Networks of France about 40%, and NEC of Japan about 21%. However, HMN Tech of China also has an 8% share, rapidly expanding its market presence, particularly in developing countries (Figure 4).

Figure 4: Market shares of suppliers in terms of the cumulative total length of cables installed during the period from 2011 to 2024



(Source) Created based on TeleGeography

In the submarine cable market, it is difficult to continue to receive orders in a stable manner, as orders for new installation tend to be unstable. Also, due to recent surges in the prices of materials and personnel expenses, even companies dominating the market are facing high business risks. Under these circumstances, Japanese companies are facing the challenge of securing their international competitiveness.

SubCom of the U.S. was acquired by Cerberus Capital Management, which is a U.S. fund making investments in defense contractors and national security assets, and the management team was replaced in 2018. Since the 2020s, SubCom has been successfully restructuring its business, serving Google as its major customer. For example, among the top 10 submarine cable installation projects for which Google placed orders for cables in and after 2019, SubCom won orders in six projects.

For Alcatel of France, it used to be a 100% subsidiary

of Nokia of Finland, but the parent company announced the sale of this subsidiary to the Government of France in June 2024, and Alcatel is now in the process of stabilizing management as a state-owned company.

Under these circumstances, it is necessary to decide whether it is appropriate to expect Japanese companies alone to enhance their profitability through their own efforts and determine how to ensure business continuity when a company finds their business unprofitable but the national government deems it unacceptable for the company to withdraw from the business. In reference to cases in other countries, the MIC will examine measures to support Japanese companies in building strong partnerships with stable customers, such as hyperscalers and other relevant customers and enhancing their ability to produce and install cables and provide maintenance services for the installed cables.

Section 9 Promotion of postal administration

1. Summary

(1) Initiatives so far

The postal network, which had been developed nationwide in Japan since the establishment of postal services in 1871, had over 24,000 offices before the privatization of the services on October 1, 2007. Even after the privatization, postal offices are intended to remain estab-

lished for widespread use throughout the country.

The MIC is working to ensure the provision of universal services by postal offices and to utilize them as bases for public services in local communities.

(2) Future challenges and directions

In Japan, the social environment has undergone significant changes, including an aging population, concentration of population in urban areas, frequent natural disasters, and the overall digitalization of society including the online processing of administrative procedures. Particularly in rural areas, the importance of postal offices as public infrastructure remaining in the community has been increasing due to the withdrawal of public enterprises fulfilling essential roles in daily life and the closure of local government branch offices providing administrative services.

Therefore, it is important for the Japan Post Group to ensure its performance as a private enterprise while maintaining the postal office network and universal services in the medium to long term. It is also crucial for

postal offices and the services they provide to contribute to the improvement of convenience for citizens and users, as well as to the local community.

The MIC needs to ensure the sound management of the Japan Post Group and fair and free competition on a continual basis, while also ensuring the stable provision of universal services by post offices. Additionally, it is necessary for the ministry to advance initiatives to improve convenience for citizens and users and to contribute to local communities by enhancing the effective utilization of the network of approximately 24,000 post offices and the deployment of diverse and flexible services adapted to a new era, as well as operational efficiency improvements, while also responding to the progress of digitalization.

2. Promotion of postal administration

(1) Ensuring universal service in postal business

A Review of postal rates and its system in response to changes in the business environment surrounding postal services

In FY 2022, a decrease in postal volume due to the widespread use of the Internet and social media, coupled with the impact of soaring fuel and other price increases, resulted in net operating loss in Japan Post's postal services, marking the first deficit since the privatization of the services, and the subsequent outlook remained quite severe. In light of this situation, on June 13, 2024, the MIC amended the Ordinance for Enforcement of the Postal Act (Ministry of Internal Affairs and Communications Ordinance No. 5 of 2003), which provides for the upper limit for the rates of standard postal items weighing 25g or less. Accordingly, on the same day, the Japan Post filed a notification of postal rate revisions with the MIC, and the rates were revised on October 1 of the same year.

At the ministerial meeting on price issues, at which

the aforementioned amendment of the ordinance was discussed, the MIC was requested to consider reviewing the postal rate system in consideration of the necessity to ensure the stable provision of postal services. In response, in June 2024, the MIC consulted the Information and Communications Council on the postal rate system in light of the environmental changes made to postal services, and discussions began by the Postal Policy Committee established under the Postal Policy Division of the same council. Specifically, the committee has deliberated on issues including (1) a desirable postal rate system amid changes in the environment surrounding postal services and (2) a transparent and appropriate method to set the rates of postal items. The committee will submit a report to the MIC by the summer of 2025.

B Grant and contribution system to support the maintenance of the postal office network

In June 2018, a grant and contribution system was established to support the maintenance of the postal office network and ensure the stable provision of universal postal services. The system began operation in April 2019. The Organization for Postal Savings, Postal Life Insurance and Post Office Network is responsible for

the disbursement of grants and the collection of contributions. For FY2025, the amount of grants to Japan Post is approximately 320.7 billion yen, with contributions amounting to approximately 263.1 billion yen from Japan Post Bank and approximately 57.7 billion yen from Japan Post Insurance.

(2) Promoting the use of post offices as “Community Hubs” in society with decreasing population

A Contribution of post offices to local communities in the digital society

In Japan, the declining birth rate, aging and decreasing population, coupled with the spread of the COVID-19, have further exacerbated the exhaustion of local communities. As a result, there is increasing anticipation for the contribution of post offices, which are present throughout the country, to local communities. In this context, it is important to determine the role that post offices should play in local communities by leveraging the benefits of digitalization and utilizing their usefulness as local hubs. In October 2022, the MIC consulted the Information and Communications Council on the contribution of post offices to local communities in the digital society, and discussions began in the Postal Policy Division of the same council. The Division deliberated on various points, including (1) collaboration between local governments and other local public infrastructure and post offices, (2) contribution of post offices to local communities through DX and data utilization, and (3) the role of post boxes (mailboxes) in the contribution of post offices to local communities. Subsequently, in June 2024, the Division made a preliminary report on the contribution of post offices to local communities. The

preliminary report proposed strategies for furthering the contribution of post offices to local communities, such as the “realization of post offices as Community Hubs in local regions” and the “utilization of data held by post offices”. The report says it is desirable to provide and promote “Community Hubs” at post offices, where some of the public services conventionally provided by local governments, organizations, and companies will be offered, particularly in regions where the maintenance of an independent local economy is becoming difficult with the provision of public services to local residents due to a decrease in the number of local governments’ and financial institutions’ branches. Also, in the report, the Division expected that post offices could serve as a foundation to promote the revitalization of the regional economy and society by promoting collaboration with private enterprises and organizations as well as utilizing various functions and digital technologies concentrated at the post offices. Additionally, the report outlined the role of post offices in providing “Community Hubs” and the approach to cost sharing by stakeholders, and called for the MIC and the Japan Post Group to conduct studies for the provision of “Community Hubs.”

B Promoting utilization as an administrative service counter

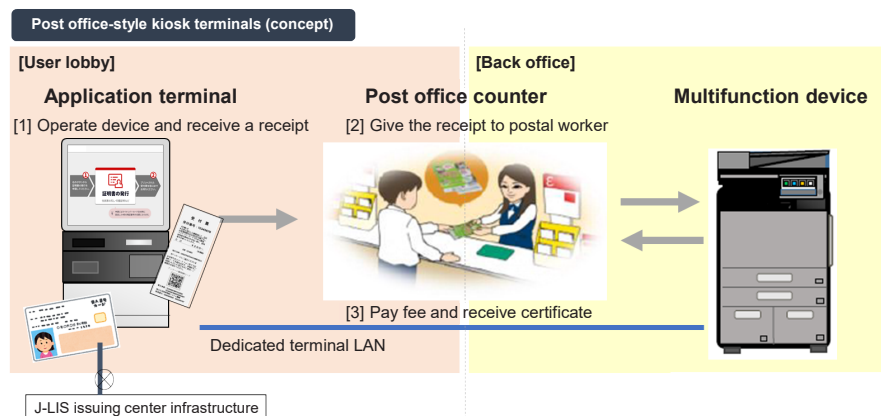
Post offices handle various local government office tasks, such as issuing copies of resident registers and other public certificates. As mentioned earlier, the importance of post offices as public infrastructure remaining in local regions has been increasing as more local government branch offices providing administrative services have been closed down. In June 2023, the Act on Handling of Certain Services of Local Governments at Postal Offices (Act No. 120 of 2001) was amended, expanding the specific services that post offices can undertake from local public entities to include new tasks such as accepting applications for the issuance of My Number Cards.

Funded by the FY2021 supplementary budget, the MIC conducted a demonstration of the development of “Post Office-type My Number Card Usage Terminals” (post office kiosk terminals) that can be introduced at low cost to digitalize the procedures to issue certificates such as copies of resident registers, enabling post offices to complete the issuance on their own, not going through local municipalities (**Figure 2-2-9-1**). Through

the “Subsidy for the Installation of Certificate Issuance Service Terminals” to which fund was allocated in the FY2022 second supplementary budget, support was provided for the introduction of certificate issuance service terminals, including the post office kiosk terminals, mainly in municipalities without convenience stores, resulting in their introduction in 20 local governments and 36 post offices (post office kiosk terminals were introduced in 15 local governments and 28 post offices.).

Also, to enhance resident services using My Number Cards, local governments have been receiving special grant tax measures (at a rate of 0.7) since FY2023 to cover the expenses for introducing certificate issuance services at post offices and other locations. Moreover, in order to ensure the sustainability of administrative services, special grant tax measures (at a rate of 0.5) will be provided to cover initial costs incurred when local governments contract post offices to provide counter services in depopulated areas, including administrative and daily life support services, in and after FY2025.

Figure 2-2-9-1 Post office kiosk terminals



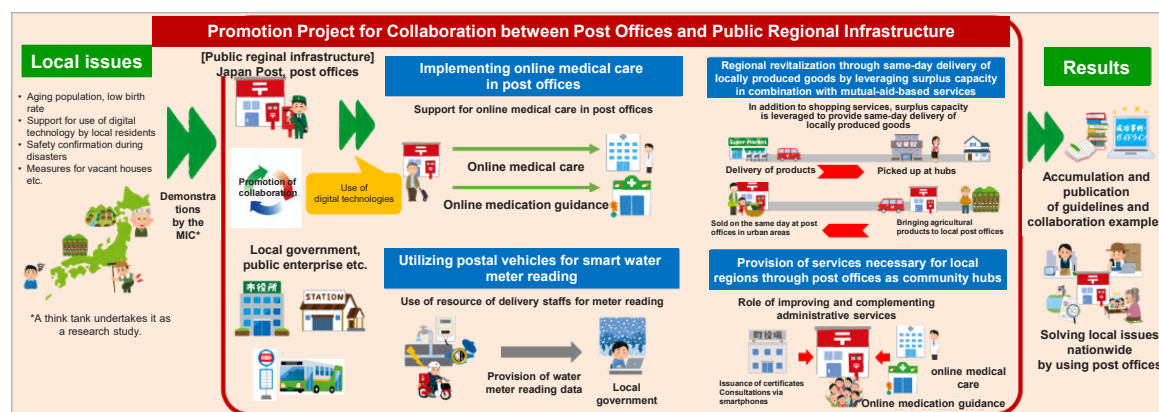
C Providing life support service for citizens

The MIC conducted demonstrations under the nationwide model project “Post Office Activation Promotion Project (Post Office × Local Public Entities × ICT)” from FY2019 to FY2021 to utilize the strengths of post offices to address various regional issues and improve user convenience.

Additionally, since FY2022, the MIC has been conducting demonstrations under the “Promotion Project for Collaboration between Post Offices and Public Regional Infrastructure” (Figure 2-2-9-2) to promote the resolution of regional issues by leveraging the power of digital technology through collaboration between post offices, which have bases throughout the country, and local governments and other entities that provide public infrastructure in the region. Demonstration projects implemented in FY2024 included those for online medical treatment and medication counseling on an isolated island (Yanai City, Yamaguchi Prefecture), combination of shopping support service with local specialty delivery service using vacant space in transportation vehicles

(Shizuoka City, Shizuoka Prefecture), smart water meter reading using postal delivery vehicles (Aomori City, Aomori Prefecture), and provision of necessary regional services by using post offices as “Community Hubs” (in Akiota Town, Hiroshima Prefecture), which helped identify the challenges to be met for the social implementation and spread use of such services. (Figure 2-2-9-3)¹ In FY2025, based on the report submitted by the Information and Communications Council, the MIC will conduct demonstration projects (Figure 2-2-9-4) to make use of the public and regional features of post offices to provide multiple functions and services for the solution of regional issues and regional sustainability. Also, as mentioned above, special grant tax measures (at a rate of 0.5) will be provided to cover initial costs incurred when local governments contract post offices to provide counter services in depopulated areas, including administrative and daily life support services. (Figure 2-2-9-5).

Figure 2-2-9-2 Promotion Project for Collaboration between Post Offices and Public Regional Infrastructure Providers



¹ Promotion Project for Collaboration between Post Offices and Public Regional Infrastructure Providers: <https://www.soumu.go.jp/yusei/kas-seika.html>

Figure 2-2-9-3 Regional demonstration

Implementing online medical care at a post office
(Yanai City, Yamaguchi Prefecture)



Using postal office monitoring service for disaster prevention
by the use of digital technologies
(Yusuhara Town, Kochi Prefecture)



Figure 2-2-9-4 Project to utilize post offices to ensure regional sustainability



Figure 2-2-9-5 Special grant tax measures to ensure the provision of administrative and other services by the effective use of post offices in depopulated areas

1. Eligible municipalities

Municipalities that outsource operations such as the issuance of official certificates (e.g., copies of family registers) to post offices and similar facilities located in depopulated areas^{*2} based on the Act on Handling of Certain Services of Local Governments at Postal Offices, etc.^{*1}.

^{*1} This also includes outsourcing based on Article 34 of the Act on Reform of Public Services.

^{*2} Article 4 (2) (iii) of the Ordinance for Enforcement of the Act on Japan Post Holdings Co., Ltd. (remote islands, Amami, mountainous areas, Ogasawara, peninsulas, depopulated areas, and remote islands in Okinawa).

2. Eligible expenses

Initial costs associated with outsourcing administrative services, including counter services, and resident livelihood support services

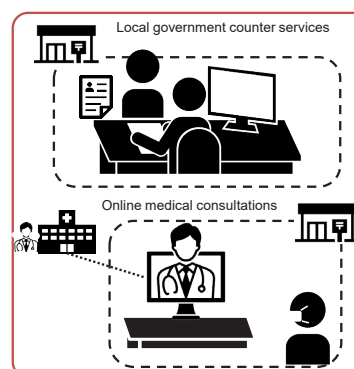
*Excluding those separately covered by fiscal measures

(Examples of the scope of eligible projects)

- Administrative services (support for applications to municipalities, online consultations, etc.)
 - Expenses related to system development, network line and equipment installation, layout modification, and public relations
- Livelihood support services for citizens
 - Expenses related to system development, equipment purchases, and public relations for shopping support
 - Expenses related to system development, network line and equipment installation, and layout modification for online medical consultations

3. Local fiscal measures

Special local allocation tax measures (coverage ratio: 0.5)



(3) Utilization of data acquired and held by post offices

The MIC is promoting the effective use of data acquired and held by post offices while ensuring the appropriate handling of the secrecy of correspondence, the secrets of others known through postal items, and personal information. Since December 2022, the ministry has been holding the meetings of the “Post Office Data Utilization Advisory Board” to obtain advice from experts and others for the implementation of initiatives by Japan Post and the MIC. As a specific initiative for the utilization of post office data, in January 2024, following the occurrence of the Noto Peninsula Earthquake, the MIC closely collaborated with Ishikawa Prefecture, Japan Post, and relevant ministries and agencies. As a result, Japan Post improved the accuracy of the list of persons whose safety was unknown as announced by the prefectural government by comparing it with resident data held by Japan Post and sent notifications to those who had moved out of the disaster area based on the information from change of address notifications to en-

sure that administrative information reached the affected individuals. Additionally, since June 2023, Japan Post has been providing a bar association with the relevant information when the bar association inquires about the new address information of an opposing party of a lawsuit, etc., which is difficult for the association to ascertain because the party has moved to the address without changing the resident register (limited to cases where the bar association determines that there is no apparent connection with domestic violence, stalking, or child abuse). Also, following the partial amendment of the Vacant Houses Special Measures Act (Act No. 127 of 2014) in 2023, vacant houses not managed appropriately were included in the category of vacant houses for which Japan Post can provide information about the change of address notifications upon inquiries from local governments. The MIC will continue to work on the utilization of post office data, taking into account the needs of public institutions and others.

(4) Response to new initiatives by Japan Post Insurance and Japan Post Bank

Based on the Postal Service Privatization Act (Act No. 97 of 2005), Japan Post Insurance made a notification about the expansion of asset management method in March 2025.

Japan Post Bank is promoting a new corporate business (Σ Business) that supports the growth of local businesses with growth aspirations by providing capital funds, thereby contributing to the revitalization of the regional economy from a medium- to long-term perspective. In February 2024, the MIC and the Financial Ser-

vices Agency received an application from Japan Post Bank for approval based on the Postal Services Privatization Act to own a subsidiary engaged in investment management operations and a specialized investment company under its umbrella, with the aim of advancing private equity investment management and operations in this business. Approval was granted in May 2024. The subsidiary is implementing measures including establishing a joint fund with other investment companies.

(5) Review of operations at the Organization for Postal Savings, Postal Life Insurance and Post Office Network concerning the repayment of fixed-term postal savings deposited before postal privatization

The Organization for Postal Savings, Postal Life Insurance and Post Office Network, which took over fixed-term postal savings deposited before postal privatization, has been implementing operations to respond to repayment claims for savings that have been treated as rights extinguished² under certain criteria. If it is determined that there were truly unavoidable circumstances for not making a repayment claim after receiving a demand notice, the organization has been responding to such claims.

Given that this operation has been in place for over ten years, the MIC requested the organization in September 2023 to review its operations to make the repay-

ment process less burdensome for claimants, including ensuring that the confirmation of circumstances is conducted in a manner that is more considerate of depositors³.

Subsequently, the organization announced a review of its operational criteria on December 20, 2023, and began implementing the new criteria in January 2024. Under the new criteria, the method of confirming truly unavoidable circumstances has been revised. As a general rule, responses are now based on verifying the details stated in the claim form rather than requiring the submission of certificates (Figure 2-2-9-6).

² According to the provisions of the former Postal Savings Act (Act No. 144 of 1947), which is deemed to be still in effect, if 20 years have passed since the maturity date and no claim for repayment is made within two months after a demand notice is issued, the depositor's rights are considered to be extinguished.

³ Request for review of the handling of refunds for fixed-term postal savings deposited before the privatization of postal services: https://www.soumu.go.jp/menu_news/s-news/01ryutsu16_02000066.html

Figure 2-2-9-6 Points of review of operations at the Organization for Postal Savings, Postal Life Insurance and Post Office Network

	Before review	After review
Subject to repay	Five instances where it is deemed that there were truly unavoidable circumstances (*) * Even after receiving a demand, cases where it is impossible to request a withdrawal due to circumstances such as disasters, accidents, or illnesses.	Broadly categorized into three items (subject to any of the following being judged as truly unavoidable circumstances) 1. Not recognizing the existence of the saving. 2. Not recognizing the existence or content of the demand notice. 3. Not requesting a withdrawal. Additionally, newly exemplify in the standards cases such as "having to care for or nurse a relative."
How to check situation	Certificate is necessary for fact-checking	Check based on contents in statement Additionally checking situation even if the content only includes "I did not know the rule".

3. Promotion of postal administration in the international field

(1) Response to the Universal Postal Union (UPU)

The Universal Postal Union (UPU), a specialized agency of the United Nations, was established in 1874 with the aim of developing a global postal network and services, thereby contributing to international cooperation in cultural, social, and economic fields by establishing rules of international mail. The UPU celebrated its 150th anniversary in 2024. In recent years, despite the challenging situation where the total volume of international mail has not recovered post the COVID-19 pandemic, the UPU is increasingly expected to play a significant role in the development of international logistics by formulating appropriate international postal frameworks in response to the expansion of cross border e-commerce.

In this context, since January 2022, Mr. METOKI Masahiko from Japan has been serving as the Director General of the UPU as the only Japanese heading a UN specialized agency (term: one term of four years, with a maximum of two terms), and he is leading initiatives to enhance the UPU's functions and rebuild its finance. His great leadership is highly recognized by UPU members, and the Government of Japan will support Mr. Metoki in

the election of the Director General of the UPU at the Congress to be held in Dubai, the UAE in September 2025 to enable him to continue to assume the position for the next term (2026 to 2029). Japan is also running as a candidate for a member of the Council of Administration (41 member countries) and the Postal Operations Council (48 member countries). Japan has been proactively approaching the governments of UPU member countries to receive their firm support for the elections.

Furthermore, the MIC is actively supporting Director-General Metoki's leadership and aims to further contribute to the UPU. Based on the Memorandum of Cooperation with the UPU, the MIC supports the implementation of cooperation projects among UPU member countries, such as efforts to build a disaster-resilient postal network, initiatives for the economic and social utilization of the postal network, and those to address climate change through the establishment of a postal network designed to minimize environmental impact. Through such support, Japan aims to contribute to the further development of the global postal network and services.

(2) Support for overseas deployment of Japanese postal infrastructure

The MIC is promoting the overseas deployment of the Japanese postal infrastructure system as part of the government's "Infrastructure System Overseas Promotion Strategy 2030"⁴ (decided by the Ministerial Meeting on

Strategy relating to Infrastructure Export and Economic Cooperation on December 24, 2024). In order to implement these measures in an effective manner through further public-private collaboration and based on the

⁴ Infrastructure System Overseas Promotion Strategy 2030 (decided by the Ministerial Meeting on Strategy relating to Infrastructure Export and Economic Cooperation in December 2024)

recognition of recent issues faced in postal services, the MIC has been organizing the “Global Postal Strategy Task Force” since December 2023 and compiled and published a report on the public-private immediate measures for global expansion of the postal services in July 2024⁵.

The overseas deployment of the Japanese postal infrastructure system will support emerging and developing countries in improving the quality of their postal services and optimizing their postal operations through the sharing of Japan’s advanced postal technologies, systems and operational know-how. To date, efforts have primarily targeted Southeast Asia, but in recent years, initiatives have been extended to new markets in Central and Eastern Europe, the Caucasus region and Central Asia. The MIC encourages the entry of Japanese companies having relevant technologies and expertise by searching for possibilities in peripheral businesses such as the supply of equipment used in sorting centers, un-

derstanding the needs and challenges related to the overall postal business in the recipient countries, and exploring new business opportunities in areas such as the growth in small parcel volumes due to e-commerce, digital transformation, and green transition.

In FY2024, surveys were conducted to optimize the postal network and operations at international exchange offices in the Philippines, as well as to optimize operations at sorting centers and the management of logistics and transportation in Kazakhstan Post. Furthermore, a pilot project was implemented to enhance the functions of sorting centers of Azerbaijan Post. The MIC will continue to enhance cooperation projects with various countries. Also, through active participation in international postal conferences and basic research on the postal situation in various countries, the ministry will build relationships with postal operators in other countries and promote the overseas deployment of the Japanese postal infrastructure system.

4. Trends in correspondence delivery business

Under the Act on Correspondence Delivery by Private Business Operators (Act No. 99 of 2002), operators in the private sector are also allowed to engage in the correspondence⁶ delivery business.

The correspondence delivery business is categorized into two types: nationwide general correspondence delivery business and specified correspondence delivery business featured with the provision of (1) large-scale, (2) express and (3) high value-added delivery services. As of the end of FY2024, 623 operators were conducting the specified correspondence delivery business, with 27 companies newly launching the business in FY2024. Services provided by these specified correspondence delivery service providers include services tailored to customer needs, such as circulating a fixed route and sequentially collecting and delivering correspondence

at each point, an express delivery service for relatively short distances or within limited areas, and a telegram-like service that delivers congratulatory or condolence messages along with a decorated card. The service providers are thus offering a range of creative services⁷. For FY2023, net sales in the business amounted to approximately 18.8 billion yen with the total number of postal items delivered reaching about 21.16 million items, hitting a record high.

To promote understanding of the purpose and system of the correspondence delivery service and ensure proper correspondence delivery, the MIC is raising the public’s awareness about the definition of correspondence and the correspondence delivery system by organizing explanatory sessions and other activities.

⁵ Global Postal Strategy Task Force https://www.soumu.go.jp/main_sosiki/kenkyu/postalservice_globalstrategy/index.html

⁶ Document addressed to a specified recipient to share the ideas of the sender or to inform the addressee of a fact (as provided for in Article 4.2 of the Postal Act)

⁷ There were no companies that launched the general correspondence delivery business.