

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-

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

(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

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.

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.

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 "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 share⁸ and 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

measurements 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**).

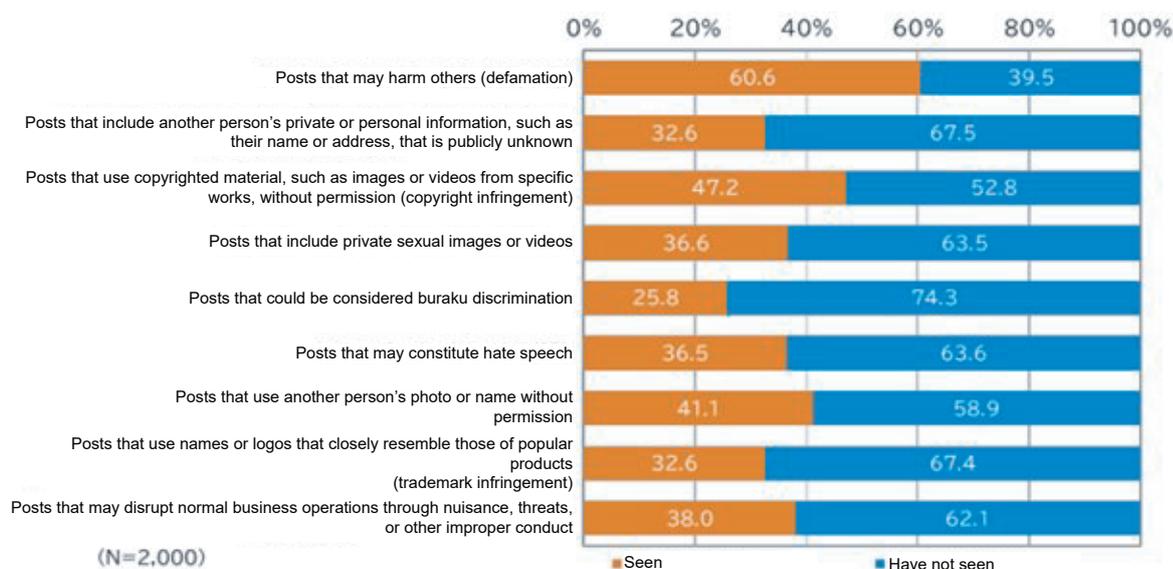
¹ WORLD ECONOMIC FORUM "Global Risks Report 2025" <<https://www.weforum.org/publications/global-risks-report-2025/>> (Reference March 10, 2025)

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-

(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

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

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