

Outline of the 2024 White Paper on Information and Communications in Japan

July 2024

**Ministry of Internal Affairs
and Communications, Japan**

(Provisional translation)

Outline of the 2024 White Paper on Information and Communications in Japan

Part 1

Special Feature 1: The Status of Information and Communications related to the 2024 Noto Peninsula Earthquake

- Analysis of **the damage to communication infrastructure, TV/radio, and post offices, efforts for service restoration, and support for reconstruction**, along with a comparative analysis of media usage (including social media) by citizens and government at the time of the earthquake with past earthquakes.
- Overview of **the emerging issues and required future responses** (disaster-resilient communication and broadcasting infrastructure, countermeasures against dis-/mis-information, etc.).

Special Feature 2: Living in Harmony with Evolving Digital Technologies

- Overview of the development history, impact on the economy and society, **utilization status and needs of the public, responses to challenges and risks, and future initiatives and prospects for the healthy utilization and coexistence of ICT-based technologies (digital technologies)** such as **AI, the metaverse, robots, and mobility** (autonomous driving) that continue to evolve.

Part 2

Current Status and Challenges for Information and Communications

- Part 2 overviews **market trends** in the information and communications field and **the current status of digital technologies' utilization**, and summarizes **the current status, challenges and future directions of information and communications policy**.

Data Collection: Related data for this white paper are posted on the website of the Ministry of Internal Affairs and Communications, Japan (MIC)

(Special Feature 1: Noto Peninsula Earthquake)

Damages to information and communication infrastructure, and initiatives for restoration

- The Noto Peninsula earthquake, which occurred on January 1, 2024, had a significant impact on the vital lifeline of national life, the information and communication infrastructure. In the Hokuriku region, communication lines were disrupted and power outages occurred, leading to the unavailability of communication services and the inability to receive television and radio broadcasts.
- Despite the difficulties in accessing the area by land due to landslides and sediment disasters, private businesses, local governments, and government agencies collaborated to implement measures for the early restoration of communication and broadcasting services. Additionally, satellite communication services were utilized.

〈Damage to information and communication infrastructure〉

Communication	<p>The maximum of about 7,800 fixed telephone lines and the maximum of about 1,500 fixed communication lines service (NTT West) were out of service.</p> <p>The maximum of 839 mobile phone base stations (799 of which were in Ishikawa Prefecture) were out of service.</p>
Broadcasting	<p>In parts of Wajima City, NHK and four commercial TV stations were out of service which effected the maximum of about 2,130 households. Two Cable TV Stations were also out of service in parts of Ishikawa Prefecture.</p>
Post Office	<p>In addition to the closure of the maximum of 117 post offices, postal and logistics businesses were delayed and suspended.</p>

〈Damage to optical fiber and cable networks〉



〈Initiatives for restoration of communication and broadcasting infrastructure〉



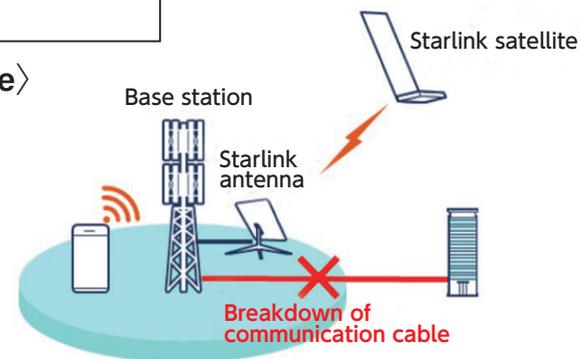
▲Transportation of base station vehicles by hovercrafts (Japan Maritime Self-Defense Force and NTT DOCOMO)



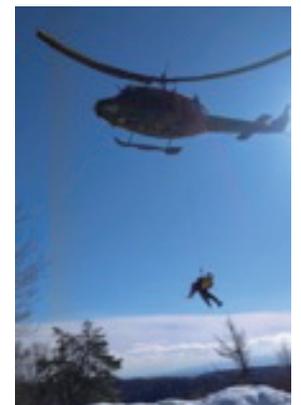
▲Base station on board (NTT DOCOMO, KDDI)



▲Drone base station (Softbank)



▲Utilization of satellite communication service (KDDI)



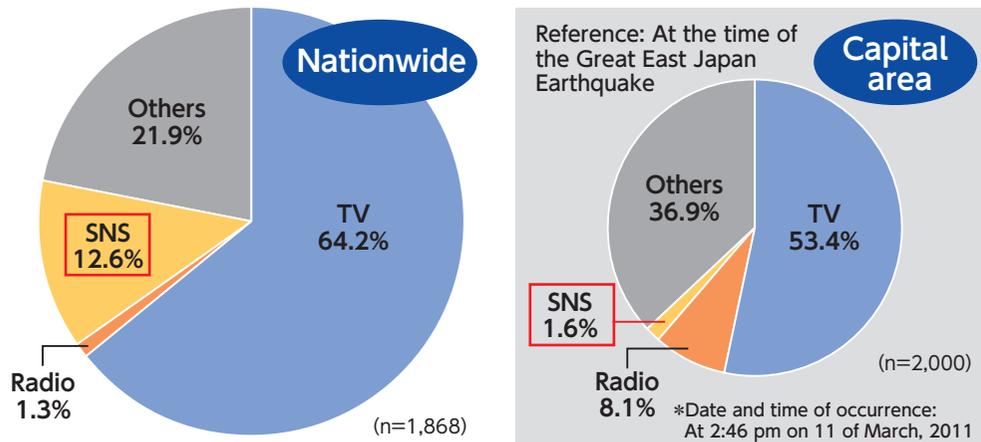
▲Refueling broadcast relay stations using helicopters (Ishikawa Television Broadcasting)

(Special Feature 1: Noto Peninsula Earthquake)

Media for obtaining information and the spread of dis-/mis-information

- TV broadcasting remains a significant source of information for obtaining earthquake-related updates, especially when compared to the 2011 Great East Japan Earthquake. The percentage of radio broadcasting to obtain information has decreased, while the percentage of social media has increased, especially among younger generations.
- On social media, there is a significant amount of "unverified information" related to the earthquake circulating. Approximately 42.7% of social media users reported encountering "one or more" of these, and about 25% of them spread this "unverified information" to acquaintances and others.

〈Media first accessed after noticing the earthquake〉



*Date and time of occurrence: At 4:10 pm on the 1st of January, 2024

(Source) Research survey reports on information studies, Interfaculty Initiative in Information Studies, the University of Tokyo (28), 65-113, 2012, Information Behavior in Tokyo Capital Area after the Great East Japan Earthquake

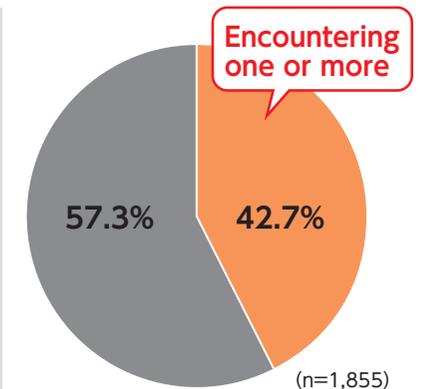


※ Samples of the questionnaire are Japanese nationwide. The number of the sample amounts to 2,060. The research was done in March 2024 on the Internet.

〈The percentage of people who encountered unverified information〉

Examples of unverified information:

- Posts requesting supports for individuals (posts requesting donations or fundraising)
- Posts with images and videos of different disasters, such as the Great East Japan Earthquake, to report on the extent of the damage.
- Posts claiming that the Noto Peninsula earthquake was an artificial one etc.



〈The spread of unverified information〉

- ▶ Among those who encountered 'at least one piece of unverified information,' 25.5% shared that information
- ▶ Main reasons to spread:
 - Thought it was useful information for others.
 - Found the information interesting.
 - Wanted to warn others that the information might be incorrect.
 - Wanted to be paid attention.



(Source) 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

(Special Feature 1: Noto Peninsula Earthquake)

Response to the highlighted challenges

- In response to the challenges highlighted by the recent earthquake, the MIC will collaborate with telecommunications and broadcasting companies to promote initiatives such as strengthening mobile phone base stations and optical fiber networks, achieving intercarrier roaming in emergencies, implementing power outage measures for broadcasting facilities, facilitating the shared use of relay stations and converting fiber cables to optical ones.
- The MIC will promote comprehensive measures including establishing an institutional framework to address the circulation of dis-/mis-information on the Internet, which has become prominent on social media, while also taking into account the international developments.

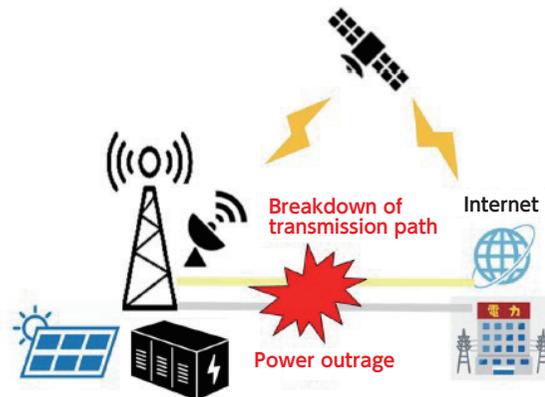
Main issue 1: Due to prolonged large-scale power outages and transportation access disruptions, the emergency power supply for communication and broadcasting facilities has run out of fuel.

Main issue 2: The spread of dis-/mis-information on social media has been increasing.

〈Strengthening of communication network〉

Example of measures:

- Extending the lifespan of storage batteries and installing solar panels
- Making redundancy of communication lines through satellite connections
- Covering wide areas in emergencies by establishing large-scale zone base stations
- Achieving intercarrier roaming in emergencies



〈Strengthening of broadcasting network〉

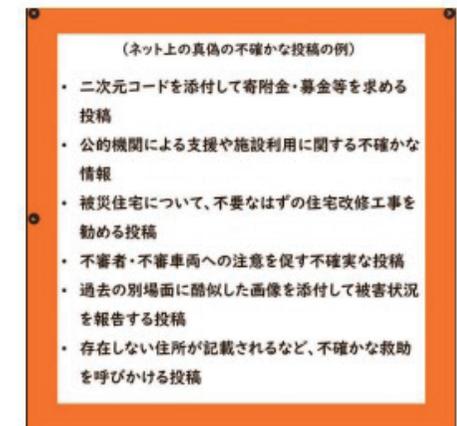
Example of measures:

- Promoting discussions among broadcasters on the shared use of relay stations and the standardization of equipment.
- Enhancing power outage countermeasures at central facilities and transmission path monitoring functions.
- Converting fiber cables to optical ones and double-tracking ones.

〈Measures against dis-/mis-information on the Internet〉

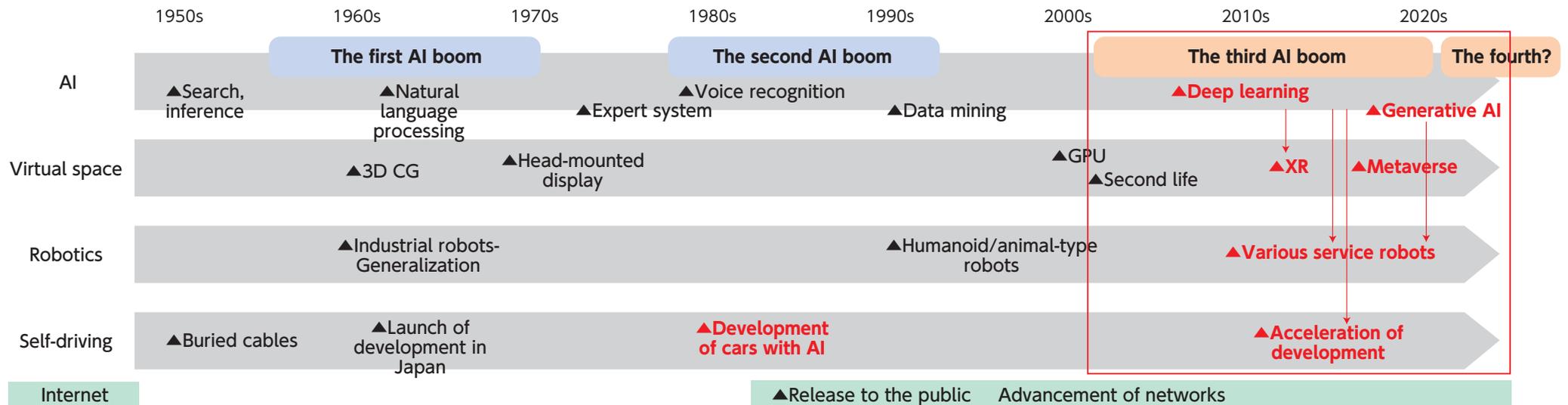
Example of measures:

- Warning issued by the Government and media outlets such as broadcasting and newspapers.
- Requesting appropriate responses from SNS platform operators.
- Considering comprehensive measures against dis-/mis-information, including institutional aspects, in the MIC's study group.



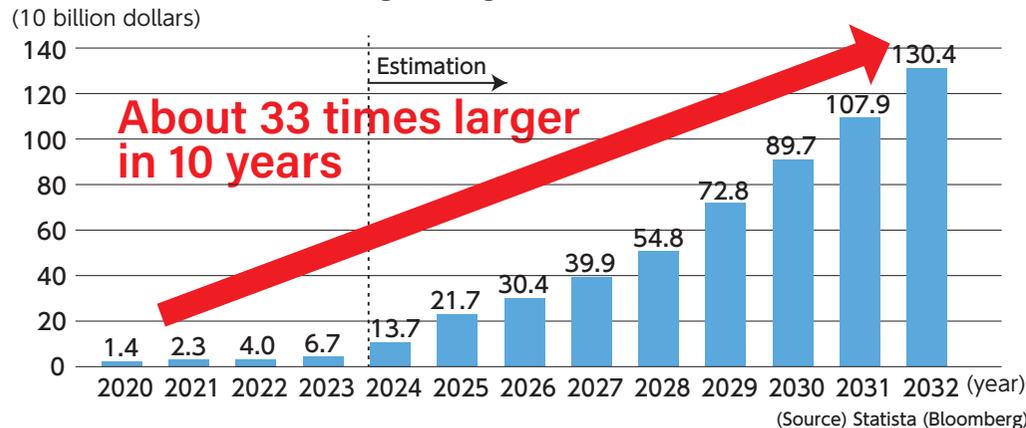
History of development of technologies and effects on economy and society

- AI has advanced through three booms and winters from its early days to the present. The development of deep learning has contributed to the advancement of technologies such as the metaverse, robotics, and autonomous driving. Additionally, the emergence of generative AI has had a significant impact on industrial structures. The progress of these "digital technologies" is expected to contribute to solving social and economic challenges.

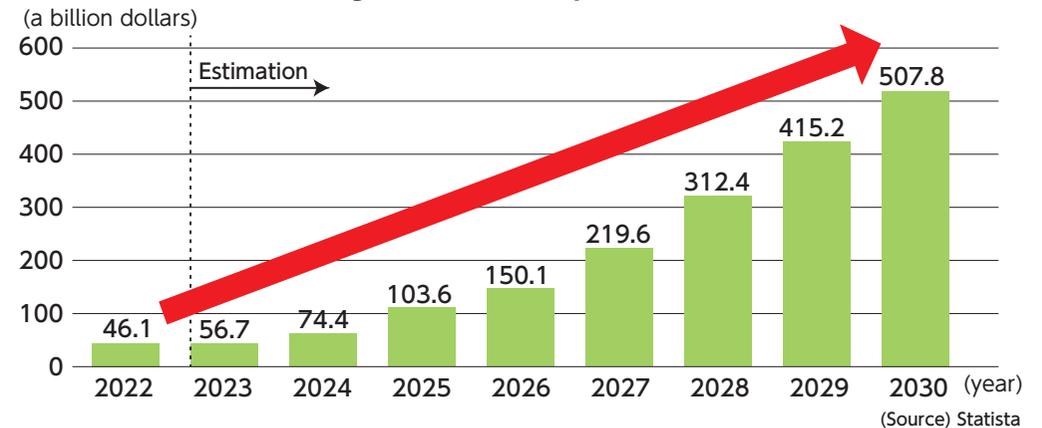


(Source) MIC

Forecast of global generative AI market size



Forecast of global virtual space market size

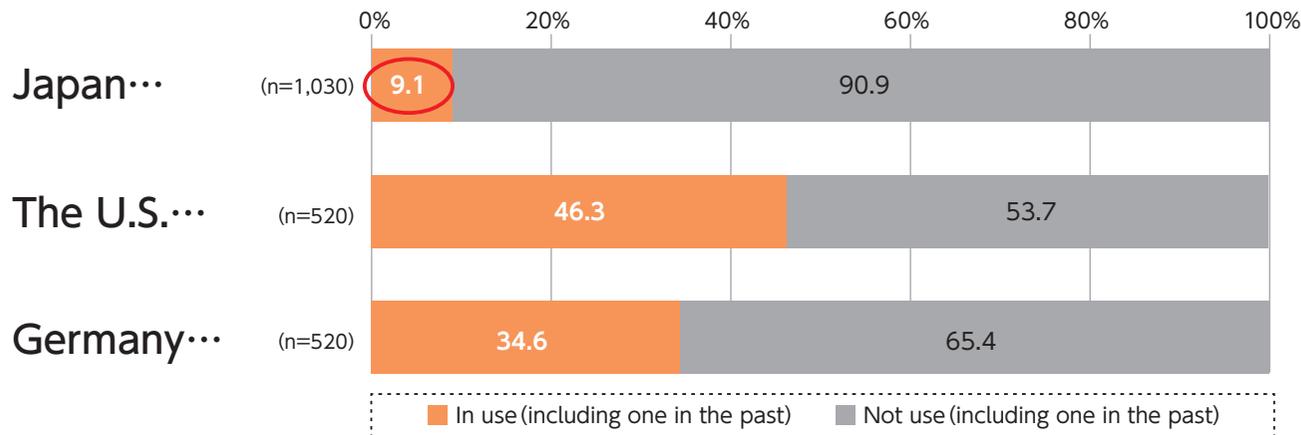


(Special Feature 2: Digital Technologies)

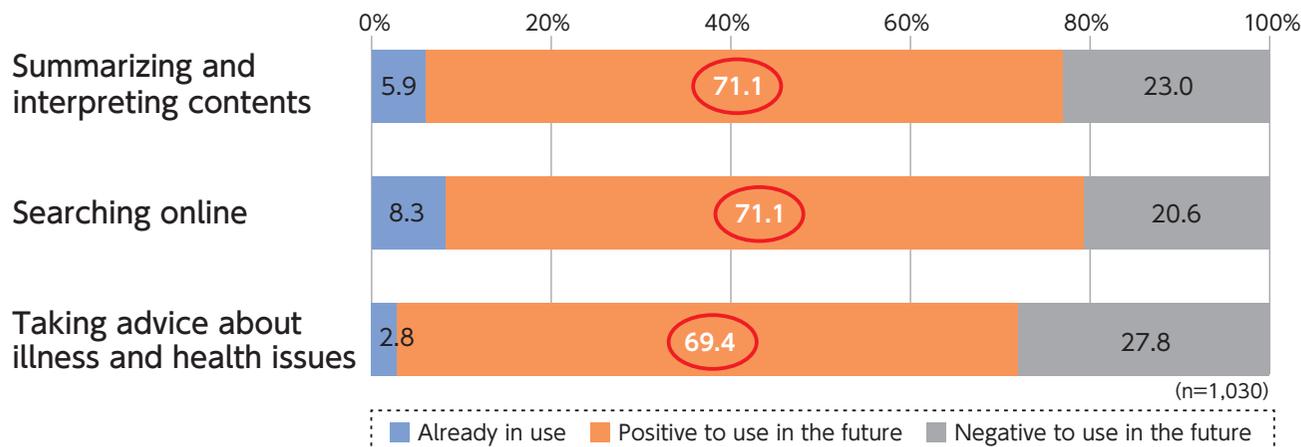
Utilization status (Result of questionnaire, examples of utilization)

- The utilization of generative AI, the metaverse, and other technologies in Japan is relatively low compared to the Western countries. However, there is a positive inclination towards future usage, with around 70% showing potential demand.
- Services leveraging generative AI and the metaverse are being developed and are increasingly being utilized in various fields such as education, employment support and elderly care.

〈Utilization status of generative AI (Global comparison)〉

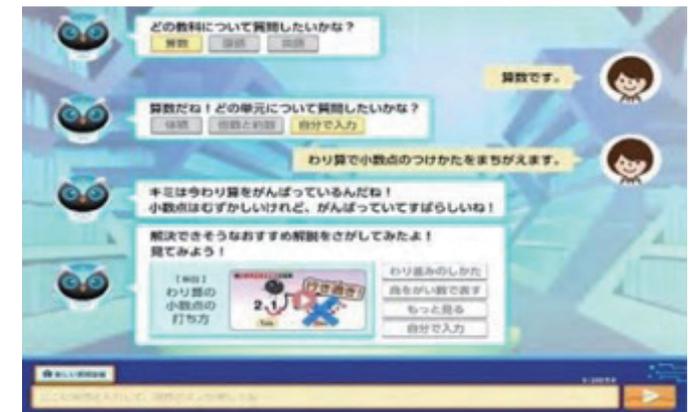


〈Intention to use generative AI by use in Japan〉



(Source) Research and study on the advancement of digital technologies and their utilization (March 2024)

〈Educational support using generative AI〉



▲"Challenge AI Coach" for elementary and junior high school students (Benesse)

〈Employment support using the metaverse〉



▲Fukuoka virtual support ROOM(Fukuoka prefecture)

Responses to challenges and risks highlighted by generative AI

- The rapid advancement and widespread adoption of AI have brought about various risks, such as the leakage of confidential information and the accelerated circulation of dis-/mis-information.
- In order to ensure the safety and security of AI, the AI Safety Institute (AISI) was established in Japan to explore evaluation methods for AI safety. Efforts to combat dis-/mis-information are promoted by the development and demonstration of technologies to distinguish AI-generated content, as well as the initiatives led by the media to attach source information to online articles and advertisements.
- Furthermore, the development of LLMs is being led by Open AI and Big Tech companies such as GAFAM, which have the capability to invest substantial amounts and collect large volumes of data daily. This raises the need for transparency in data handling, ensuring a fair market environment, and enhancing Japan's international competitiveness.
- As part of the response, collaboration between industry, government, and academia is being promoted to develop domestically produced LLMs and establish high-quality, safe Japanese-centric learning data.

(Other responses internationally and institutionally are on the next page.)

Ensuring safety and security in AI

〈Establishment of Japan AI Safety Institute〉



- ▶ As a central institution for AI safety, promoting ensuring specialized personnel and aggregating technical knowledge
- ▶ Establishing an international network such as AISI in various countries, considering measures for ensuring the safety of AI

Countering against dis-/mis-information

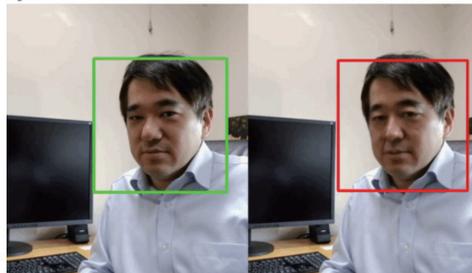
〈Development of technology to distinguish AI-generated contents〉

SYNTHETIQ VISION

SYNTHETIQ VISION API can be used to detect forgery of human face.

Example of detection result:

- Left: Real
- Right: Fake



(Source) Global Research Center for Synthetic Media, NII

Strengthening international competitiveness

〈Development of domestically produced LLMs〉

NICT

- ▶ In addition to developing its own LLM, NICT is preparing large, high-quality, and highly secure Japanese-centric training data necessary for LLMs development by private companies and other entities.

NTT tsuzumi

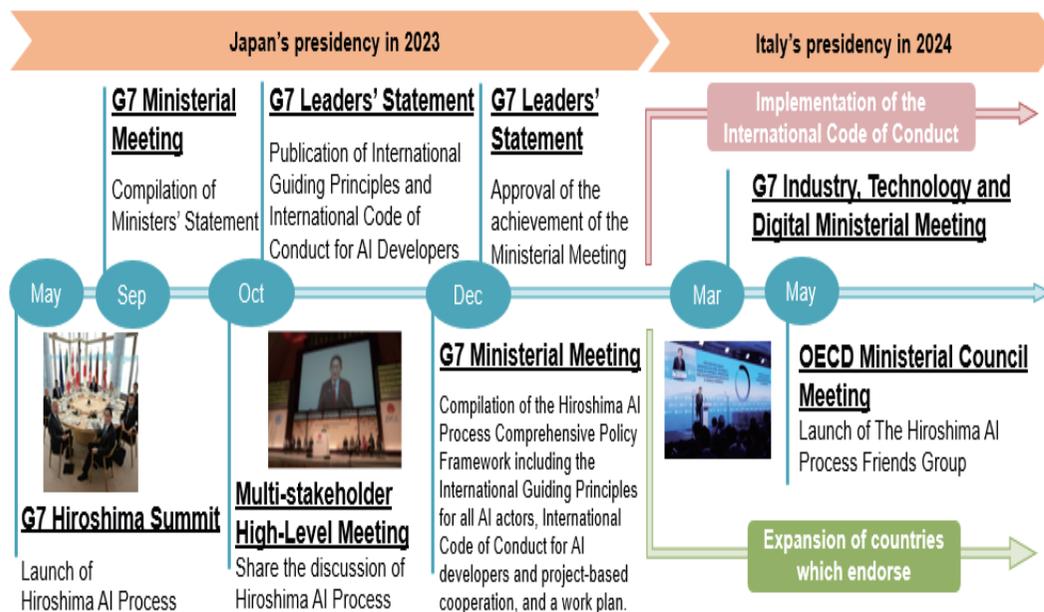
- ▶ Despite being lightweight, it possesses world-class Japanese language processing performance.
- ▶ It can be tuned to specialize in specific industries or corporate organizations.
- ▶ Commercial services began in March 2024.

(Special Feature 2: Digital Technologies)

Rule making and international cooperation on AI

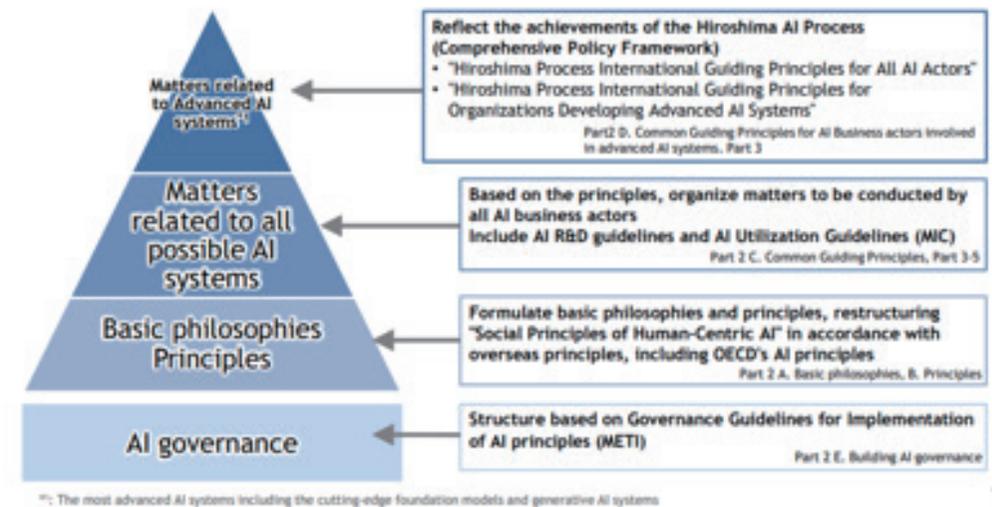
- The Hiroshima AI Process was launched in conjunction with the G7 Hiroshima Summit, taking the lead in establishing international rules for generative AI.
 - In December 2023, the Hiroshima AI Process Comprehensive Policy Framework led by our country, including International Guiding Principles and Code of Conduct, was approved in the G7 Leaders' Statement.
 - In May 2024, building on the achievements of the Hiroshima AI Process, the OECD AI Principles was revised and Prime Minister Kishida announced the launch of the Hiroshima AI Process Friends Group at the OECD Ministerial Council Meeting, which our country chaired, leading outreach efforts beyond the G7.
- In the US, the Executive Order on the Safe, Secure, and Trustworthy Development of Use of AI was announced in October 2023. In the EU, the world's first comprehensive AI regulation, the "EU AI Act," targeting AI operators, was enacted in May 2024.
- Domestically, the AI Guidelines for Business were formulated and published in April 2024. Going forward, the institutional framework will be examined in light of various risks and international developments of soft law (standards, guidelines, etc.) and hard law (laws, standards, etc.) related to AI.

〈Promotion of Hiroshima AI Process〉



(Source) MIC

〈The parties which the AI Guidelines for Business are intended for〉



(Source) MIC & METI, Outline of "AI Guidelines for Business Ver 1.0" (April 2024)

(Special Feature 2: Digital Technologies)

Initiatives for healthy utilization and coexistence

- Various digital services utilizing AI have deeply penetrated our lives. Technologies such as the metaverse, robotics, and autonomous driving are expected to contribute to solving various social and economic issues in Japan, such as regional revitalization and disaster prevention.
- It is important to further promote the following initiatives, in addition to ensuring cybersecurity, to effectively utilize these technologies and realize a society where we live in harmony with them.

1 Utilizing digital technologies to strengthen industrial competitiveness and solve social issues

- The use of digital technologies is now essential for enhancing competitiveness in various industries and addressing societal challenges.
 - ▶ To promote its use in different fields, the MIC will enhance AI computing resources, expand and improve high-quality data, and advance research and development of foundational models (to strengthen AI development capabilities)
 - ▶ The use of digital technologies for addressing societal challenges on a case-by-case basis will be promoted.
 - ▶ Enhancing transparency and improving fairness in the market environment and user protection will be promoted, in response to the movements of big tech companies to gain monopolistic positions in both technological and business aspects, particularly in AI development.

2 Ensuring healthiness in the digital space and improving skills to utilize technologies

- In the increasingly complex digital space due to generative AI, ensuring the healthiness of information flow is crucial, as is improving skills to effectively use technologies.
 - ▶ The MIC will consider responses to the distribution and spread of dis-/mis-information, involving a wide range of stakeholders, including platform operators.
 - ▶ Measures to improve literacy so that citizens can appropriately send and receive information will be promoted.
 - ▶ The development and skill enhancement of human resources who can appropriately and proactively use digital technologies will be promoted.

3 Realizing communication networks to support digital technologies

- In response to the structural changes in networks driven by AI and the proliferation of new services such as the metaverse, the need for a stable communication network is increased.
 - ▶ The MIC will promote initiatives towards Beyond 5G, which enables ultra-high-speed, ultra-large-capacity, ultra-low-latency data transmission, and low power consumption.
 - ▶ Building communication networks for the realization of autonomous driving will be promoted.

4 Establishing and applying rules for safe, secure and reliable use, and promoting international cooperation

- It is important to collaborate with the international community to promote and establish standards and rules in the borderless digital space.
 - ▶ Raising awareness of the AI Guidelines for Business and considering the institutional framework as the whole of the government will be promoted.
 - ▶ The lead in initiatives related to AI governance will be taken, collaborating with other countries while promoting the dissemination and expansion of the achievement of the Hiroshima AI Process.

Part 2 Chapter 1 Trends in the ICT Market

Part 2, Chapter 1 Trends in the ICT Market analyzes the data on the latest market trends in the information and communications field.

- Section 1 Trends in the ICT industry
- Section 2 Trends in the telecommunication field
- Section 3 Trends in the broadcasting and content field
- Section 4 Trends in radio wave usage in Japan
- Section 5 Trends related to ICT equipment and devices in Japan and overseas
- Section 6 Trends in platforms
- Section 7 Trends in the market of ICT services and contents and application services
- Section 8 Trends in the data center market and cloud services market
- Section 9 Trends in AI
- Section 10 Trends of cybersecurity
- Section 11 Trends in digital usage
- Section 12 Trends in postal service and correspondence delivery business

Part 2 Chapter 2 ICT policy initiatives in the MIC

Part2, Chapter 2 ICT policy initiatives in the MIC summarized current ICT policy initiatives and future directions.

- Section 1** Promotion of comprehensive ICT policies
- Section 2** Trends in telecommunications business policies
- Section 3** Trends in radio policy
- Section 4** Trends in broadcasting policy
- Section 5** Trends in cybersecurity policy
- Section 6** Promotion of ICT usage
- Section 7** Trends in ICT technology policy
- Section 8** Promotion of international strategies for ICT
- Section 9** Promotion of postal administration