

# Outline of the 2023 White Paper on Information and Communications in Japan

---

Toward Realizing the Resilient and Sound Data Flow Society  
for the New Era

July 2023

Ministry of Internal Affairs and Communications

# Outline of the 2023 White Paper on Information and Communications in Japan <sup>1</sup>

## Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era

Part 1 overviews the process of the progress in data flow, which accompanied the advancement of telecommunications infrastructure in Japan, analyzes the current situation, challenges and new trends of data flow and use, and surveys initiatives toward a data flow society where everyone can enjoy the benefits of diverse services using data.

Chapter 1 Advancement of the telecommunications infrastructure and progress in data flow

Chapter 2 Current situation and challenges of data flow and use

Chapter 3 Toward realizing a resilient and sound data flow society

## 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 technology utilization, and summarizes the current status, challenges and future directions of information and communications policy.

### Chapter 4 Trends in the ICT Market

- Summary and analysis of **the overall condition of the ICT industry in Japan and abroad** (e.g., GDP of the information and communication industry, amounts of exports and imports of ICT goods and services) and **the current status of individual markets** (e.g., telecommunication, broadcast content and applications)
- Summary and analysis of **the current status of utilization of digital technologies** in the citizen's lives, corporate activities and the public sector **in Japan and abroad**

### Chapter 5 Status of ICT Policy at MIC

- Summary of **cross-departmental initiatives in the ICT fields** (e.g., promotion of the Vision for a Digital Garden City Nation) and **the policies implemented by MIC and future directions** in **each policy area** (e.g., telecommunication, radio, broadcasting policies)

## Policy Focuses

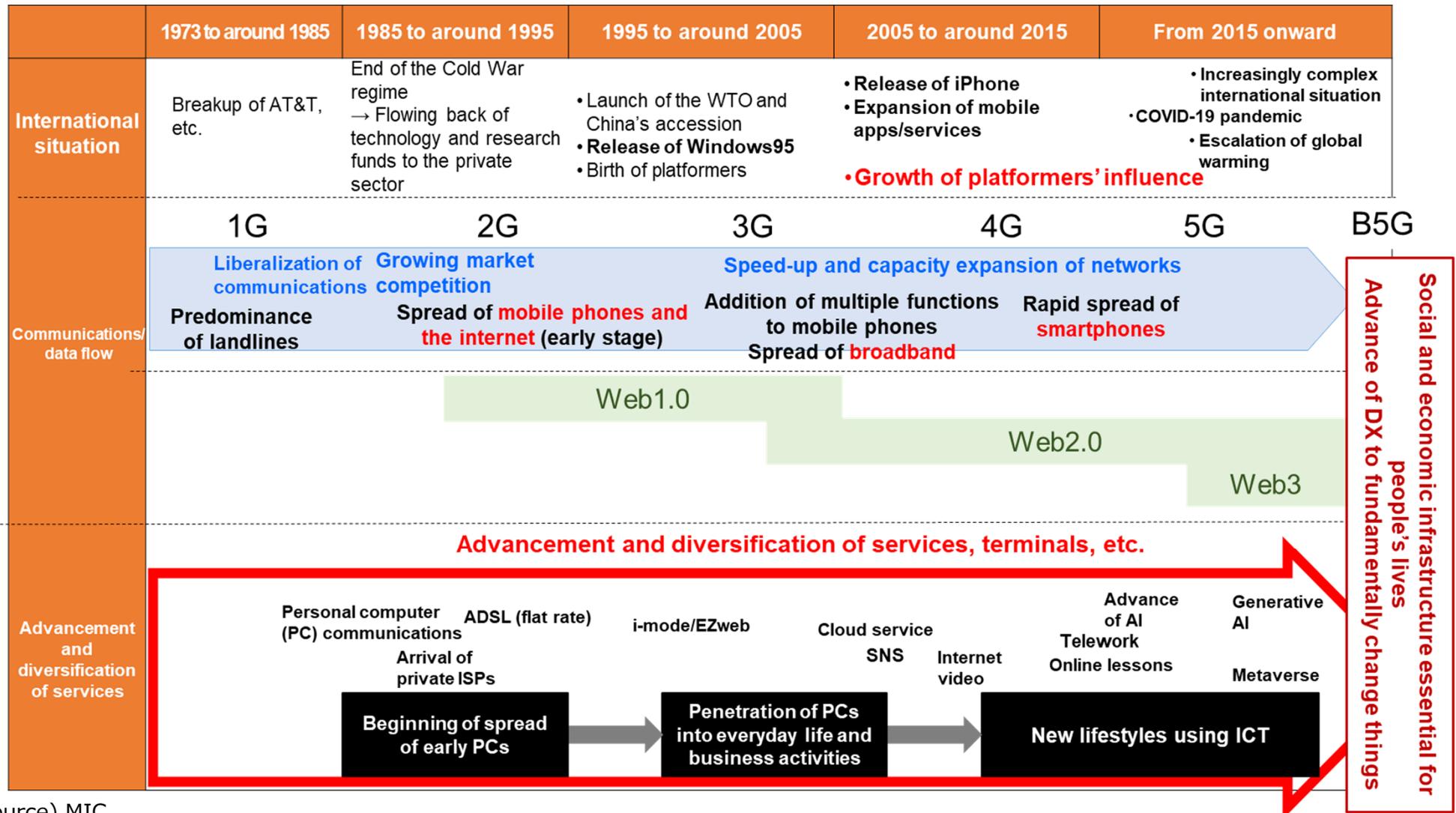
- Introduces some important, topical MIC policies

(information and communications policies with a view to 2030; G7 Digital and Tech Ministers' Meeting in Takasaki, Gunma; Beyond5G; and maintenance and promotion of the free and open Internet)

**Data Collection: Related data of Part 1 and Part 2 are posted on the website of MIC**

# Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era (i)

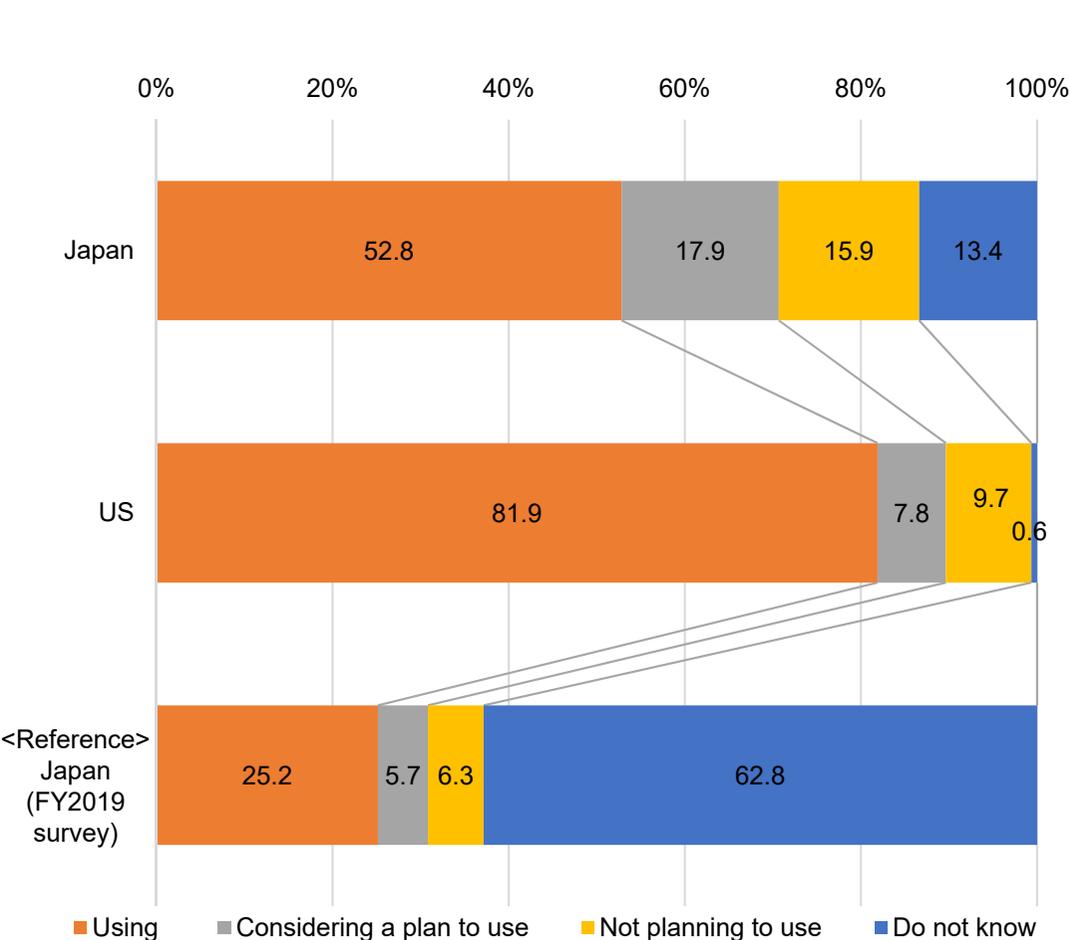
- **Data flow continues to grow** due to the **advancement of telecommunications infrastructure** and the **diversification of digital services**, among other factors.
- At an early stage of the spread of the internet, **one-way data flow**, such as viewing of websites, was predominant (**Web 1.0**). From the beginning of the 2000s, **two-way data flow between general users** has continued to grow due to the spread of social networking services (SNS) (**Web 2.0**). In recent years, **Web 3**, which is based on **data flow** and **decentralized data management** using blockchain technology, has been attracting attention.
- Moreover, in various countries, including Japan, new services using the **metaverse** and **generative AI** have emerged (e.g., ChatGPT and prompt-based image-generation AI).



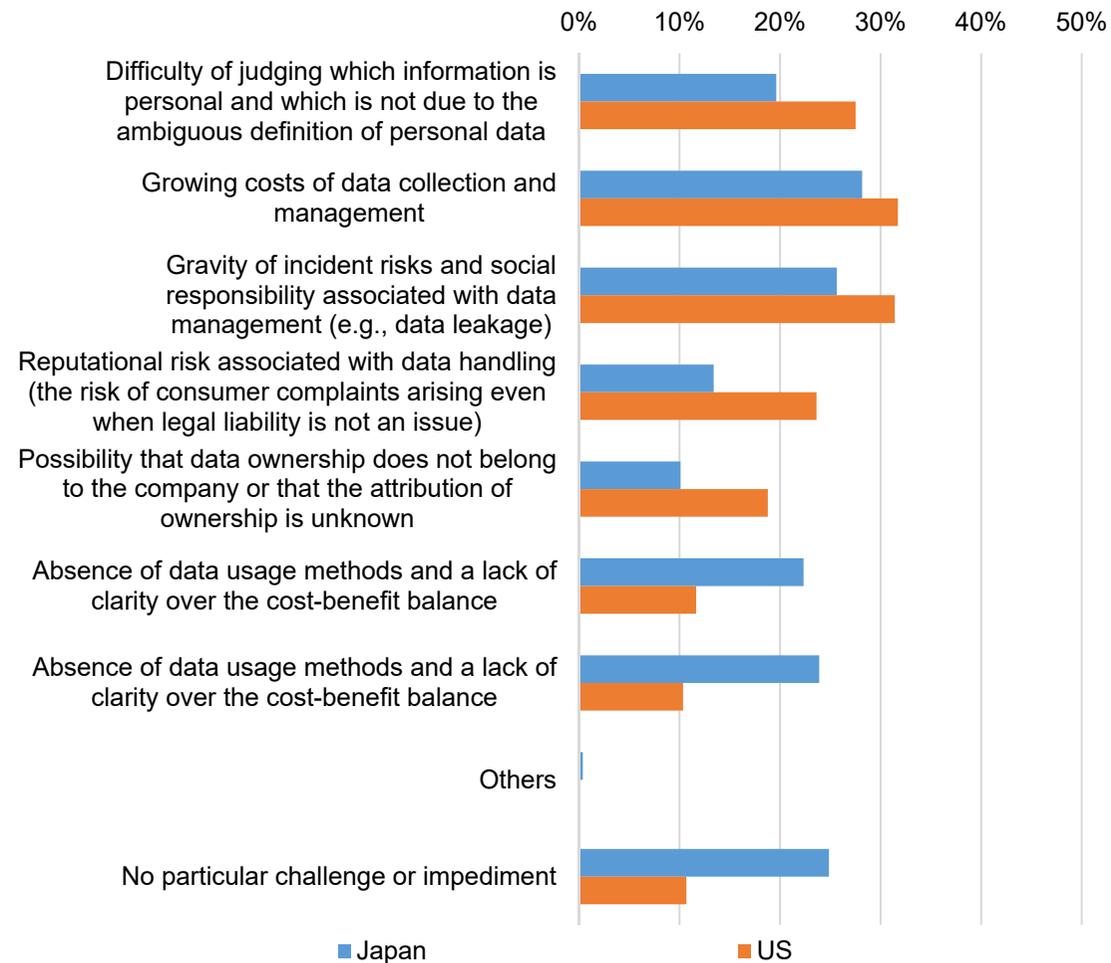
# Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era (ii)

- While Japanese companies' data utilization is progressing, the rate of its utilization is comparatively low compared with US companies' rate.
- Many Japanese companies cite **“costs of data collection and management”** and the **“gravity of risks and social responsibility associated with data management”** as challenges and impediments to data usage.

[Companies' use of personal data]



[Challenges and impediments to use of personal data]

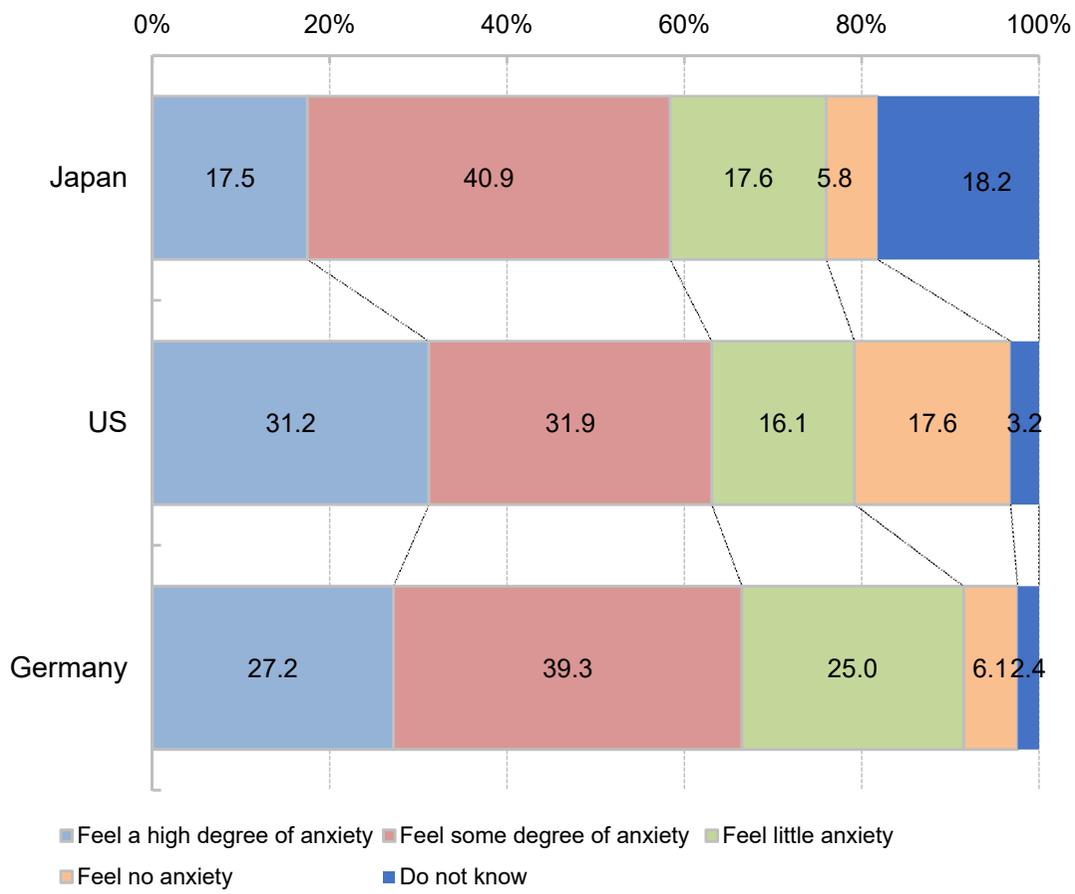


(Source) Prepared from MIC (2023) "Survey Research on R&D on the Latest Information and Communications Technologies and Trends of Use of Digital Technologies in Japan and Abroad" and MIC (2020) "Survey Research on Consumers' Awareness about Data Flow Environment, etc."

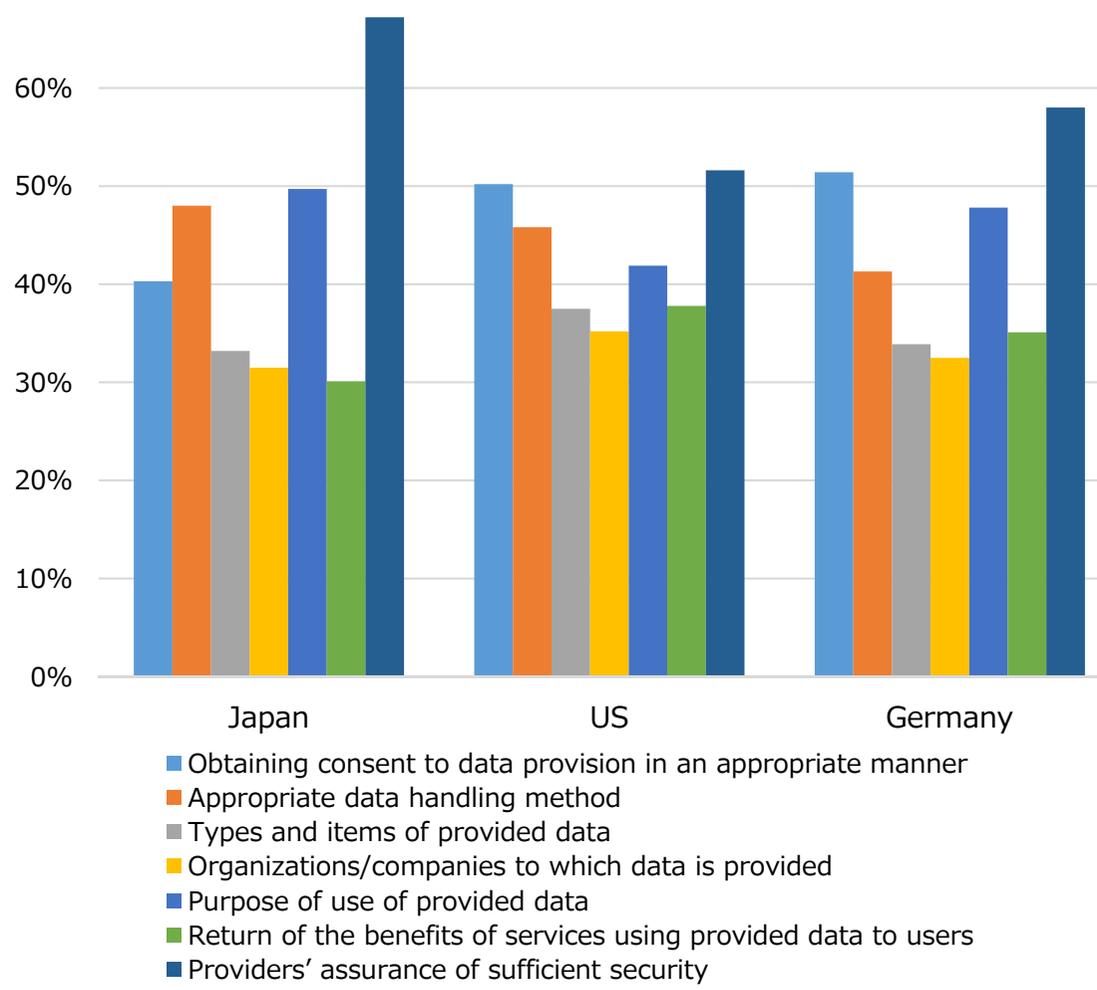
# Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era (iii)

- While digital services provided by platformers, such as SNS and search engines, contribute to better convenience in our everyday life, some users **feel anxiety about providing personal data to the platformers** when using the services.
- In Japan, many users cite **“assurance of sufficient security,” “purpose of data usage” and “appropriate data handling method”** as important points of consideration when providing personal data to platformers.

[Presence or absence of anxiety about providing personal data]



[Items and conditions that users consider to be important when providing personal data]

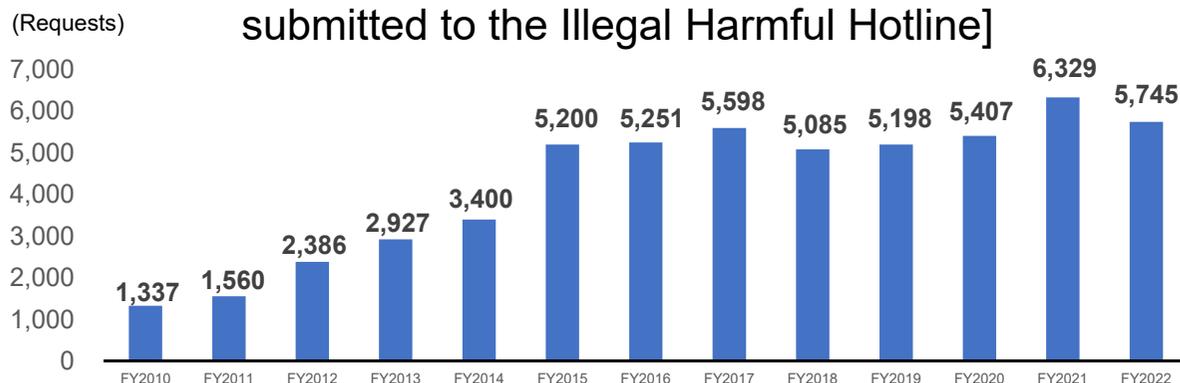


(Source) MIC (2023) “Survey Research on Advancement of ICT Infrastructure and Flow of Digital Data and Information”

# Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era (iv)

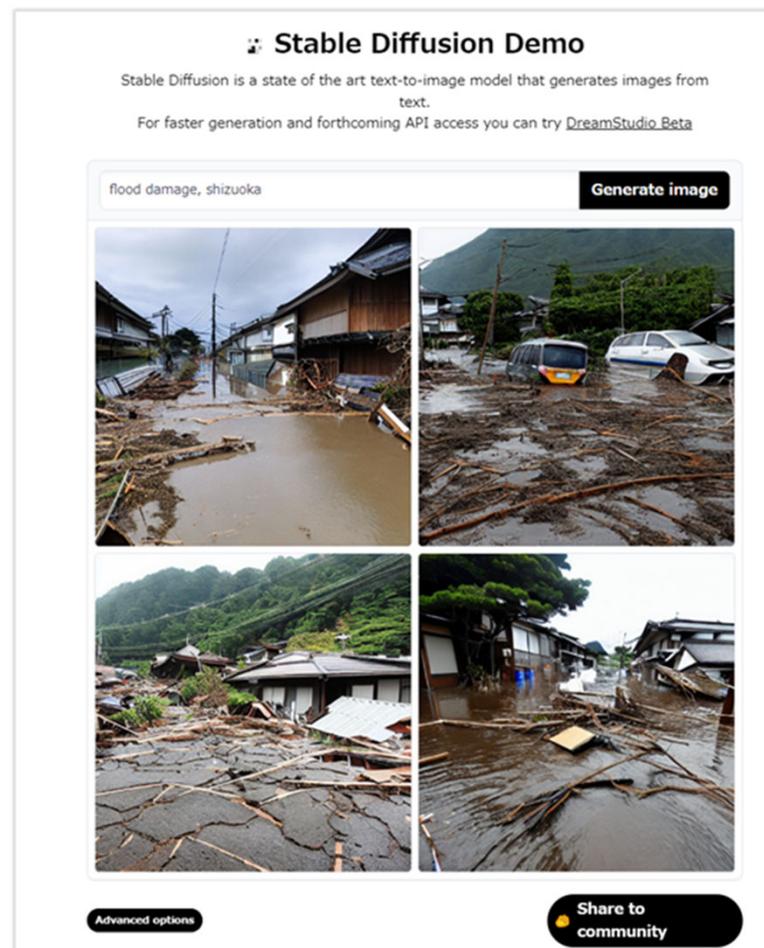
- On platform services including SNS, **information tends to become biased** (e.g., an **echo chamber** where users see only opinions similar to theirs; and a **filter bubble** where information other than that favored by the user is automatically excluded) due to their characteristics (e.g. **attention economy and algorithm**).
- With the spread of SNS, etc., users can easily obtain and send various kinds of information, but the problem of **distribution and diffusion of slander, defamation and disinformation** has come to surface. The spread of **AI Deep Fakes** is likely to accelerate the diffusion of fake images and videos.

[Changes in the number of requests for consultation submitted to the Illegal Harmful Hotline]



(Source) MIC "FY2022 Report on contract works including consultation services concerning illegal/harmful information on the internet (Summary).

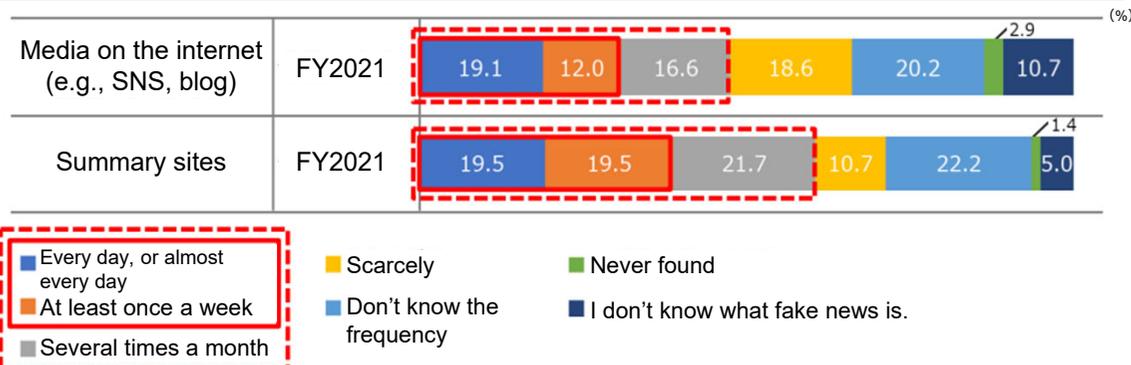
[Cases of disinformation/misinformation]



(Source) Spectee, "Shizuoka disaster rumor - New age brought about a rapid evolution of image generation AI" (September 28, 2022)

[Frequency of contact with disinformation/misinformation on the internet]

How frequently have you found fake news\* in the following media during the past month? \*Here, the term refers to false or misleading information/news

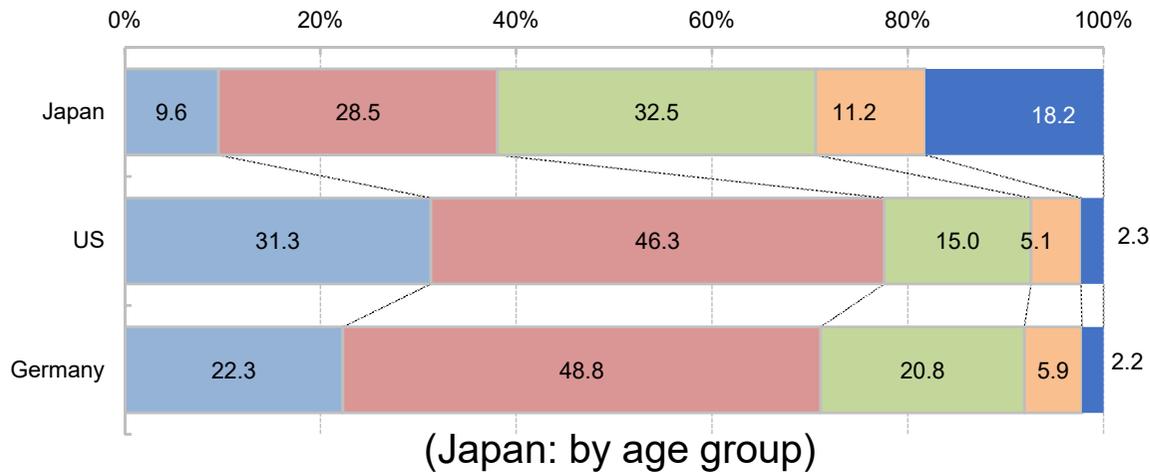


(Source) MIC, "FY2021 Survey on attitude to misinformation at home and abroad"

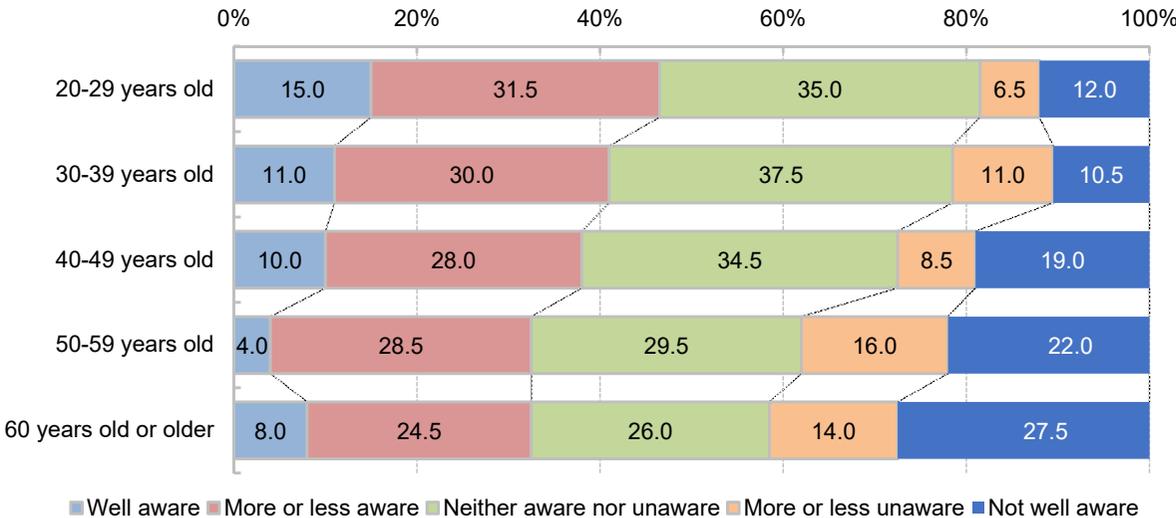
# Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era (v)

- The percentage of those who replied that they were **aware** (total percentage of those who replied that they were “well aware” or “more or less aware”) of SNS’ **tendency to expose users disproportionately to opinions and thoughts similar to their own** (echo chamber effect) was **low compared with the percentages in the United States and Europe**. In Japan, by age group, the percentage of those who replied that they were aware of that tendency was low among the respondents in their 50s and 60s compared with other age groups.
- The level of awareness of activities to counter false information and misinformation, such as fact-checking, is also low in Japan compared with the levels in other countries.

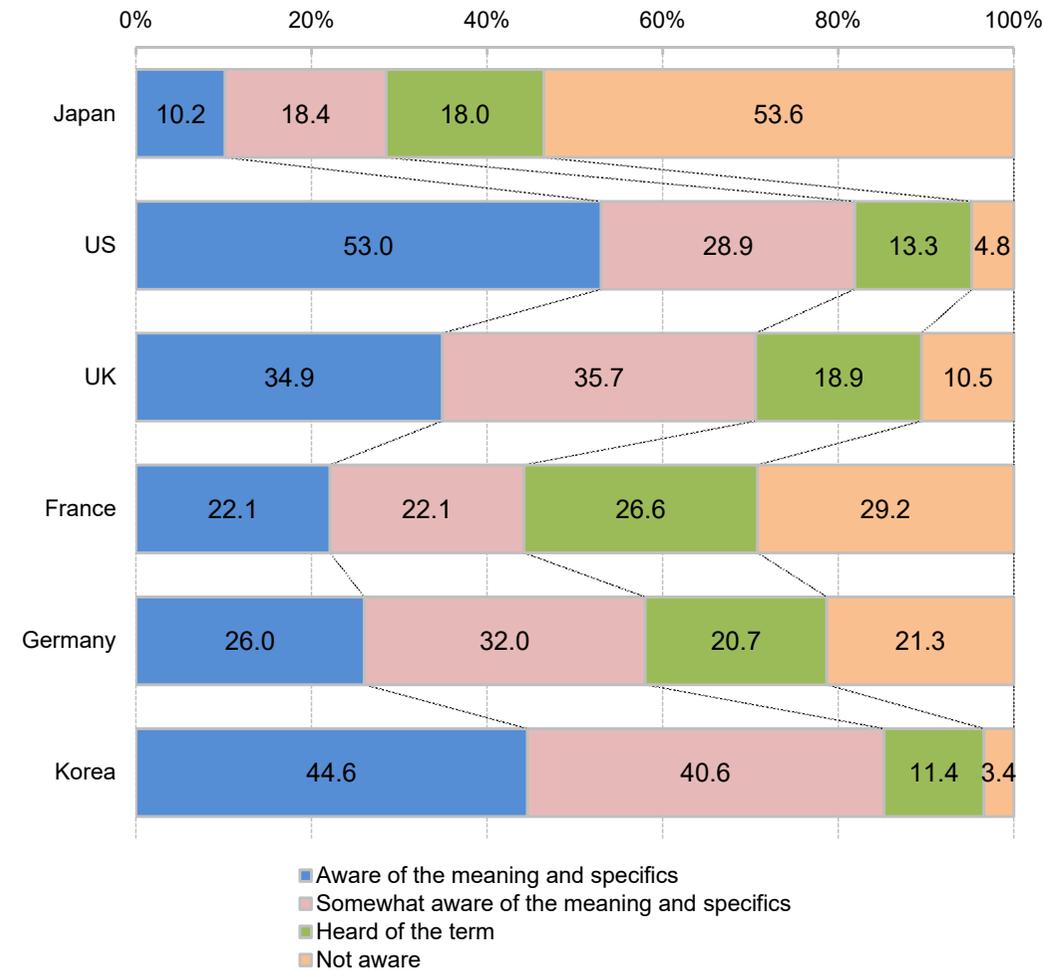
[Awareness of the echo chamber effect]  
(International comparison)



(Japan: by age group)



[Level of awareness of fact-checking]



(Source) MIC “2021 Survey on Awareness about False Information in Japan and Abroad”

(Source) MIC (2023) “Survey Research on Advancement of ICT Infrastructure and Flow of Digital Data and Information”

# Part 1: Toward Realizing the Resilient and Sound Data Flow Society for the New Era (vii)

- **Diverse digital services using data** have penetrated deep into our lives. Application technologies related to Web 3 and **new services such as the metaverse** are also attracting attention, and there are expectations that those services **will contribute to resolving various social and economic challenges** faced by Japan, including regional revitalization and disaster risk management.
- It is important to promote efforts to **realize a society in which everyone can enjoy the benefits of data usage by promoting safe and appropriate data flow.**

## Resilient communications networks underpinning data flow

- ◆ **Develop communications networks resilient against disasters and secure alternative means of communication** (e.g., intercarrier roaming and use of non-terrestrial networks) in order to realize an environment conducive to continuous use of digital services in emergencies.
- ◆ Promote **geographical diversification of data centers and submarine cables** from the viewpoint of enhancing resilience against disasters.
- ◆ **Strengthen cybersecurity and response to supply chain risks** from the viewpoint of **economic security** amid the increasingly complex international situation.

## Early realization of Beyond 5G to underpin ultra-high-speed, ultra-high-capacity data flow

- ◆ Strengthen and accelerate efforts to develop **Beyond 5G (6G), which enables ultra-high-speed, ultra-high-capacity data flow with ultra-low delays** in order to spread new services, including metaverse, and realize data-driven Society 5.0.
- ◆ Amid the deepening of environmental problems, including global warming, it is necessary to realize **Beyond 5G, which enables data flow with ultra-low electricity consumption, at an early time.**

## Contributions to standardization and development of international rules

- ◆ In borderless digital spaces, it is important to **promote standardization and develop rules in cooperation with the international community.**
- ◆ Regarding **AI**, which is spreading and evolving at a remarkable pace, promote the **development of an AI usage environment** in cooperation with other countries based on the **Hiroshima AI Process**, which was launched at the **G7 Hiroshima Summit**, and the **action plan agreed upon at the G7 Digital and Tech Ministers' Meeting.**
- ◆ Regarding the **metaverse**, promote efforts to realize **interoperability** between different metaverses and to **develop international standards concerning relevant technologies.**

## Realization of a diverse and sound information space

- ◆ **Improve literacy** so that **individuals** can **appropriately receive and disseminate information** and **make correct use of new tools and services**, including AI, in internet spaces where various sorts of data and information flow.
- ◆ Encourage a **broad range of stakeholders**, including platformers, who act as information media, to **make voluntary efforts** (e.g., fact-checking, and research and development) on the condition that consideration be given to the freedom of expression and that transparency be ensured.

# Part 2: Trends in the ICT Market

- ICT market size (expenditure)  
(Year 2022) **27.2 trillion yen**  
YoY: 5.2% increase
- Domestic production values of ICT industry (Year 2021, nominal) **52.7 trillion yen**  
9.7% of all industries, YoY: 0.8% increase
- ICT investment  
(Year 2021 (Year 2015 values)) **15.5 trillion yen**  
17.8% of all corporate capital investment  
YoY: 0.4% decrease
- Trade value of ICT goods and service (Year 2021, nominal)  
**Import: 19.2 trillion yen**  
YoY: 14.6% increase  
**Export: 12 trillion yen**  
YoY: 13.3% increase
- Research spending on ICT industry (FY2021) **3.4 trillion yen**  
24.2% of all corporate research spending  
YoY: 1.6% decrease
- Researchers on ICT industry  
(FY2021) **157,000**  
29.7% of all corporate researcher  
YoY: 6.0% decrease
- Population coverage rate of 5G  
(End of FY2021) **93.2%**
- Internet traffic  
(November 2022, fixed broadband, download) **29.2Tbps**  
YoY: 23.7% increase
- Fixed-line broadband services subscriptions (End of FY2021) **43.83 million**  
YoY: 2.7% increase
- Sales of all broadcasters  
(FY2021) **3.7 trillion yen**  
YoY: 4.6% increase
- Subscribers to broadcasting services (FY2021) **81.613 million**  
YoY: 0.2% decrease
- Size of the digital advertising market  
(Year 2022) **3.1 trillion yen**  
YoY: 13.7% increase
- Number of 5G-compatible smartphone shipments  
(Year 2021) **17.53 million units**  
YoY: 67.7% increase
- Market size of 5G base stations (shipment value)  
(Year 2022) **303.5 billion yen**  
YoY: 6.2% increase
- Size of the video streaming market  
(Year 2022) **530.5 billion yen**  
YoY: 15.0% increase
- Size of the metaverse market  
(Year 2022, sales prospect) **182.5 billion yen**  
YoY: 145.3% increase
- Size of the data center service market  
(Year 2022, sales prospect) **2.0 trillion yen**  
YoY: 15.3% increase
- Size of the cloud service market  
(Year 2022, sales prospect) **2.2 trillion yen**  
YoY: 29.8% increase
- The number of cyber-attack-related communications detected by NICTER  
(Year 2022) **About 526.6 billion**  
YoY: 0.9% increase
- Internet usage rate (individuals)  
(Year 2022) **84.9%**  
Previous year: 82.9%
- Smartphones ownership rate (individuals)  
(Year 2022) **77.3%**  
Previous year: 74.3%
- Telework use situation  
(ratio of the enterprises introducing telework in 2022) **51.7%**  
Previous year: 51.9%
- State of Introduction of IoT/AI  
(Introduction rate, Year 2022) **13.5%**  
Previous year: 14.9%

## Promotion of Comprehensive ICT Policy

### Promotion of the Vision for a Digital Garden City Nation

- Toward realization of the vision, MIC is accelerating the “development of hard and soft digital infrastructure,” “development and securing of digital human resources,” “initiatives to prevent leaving anyone behind,” and other initiatives.
- **Vigorously promoting the development of digital infrastructure including optical fiber and 5G based on the Infrastructure Development Plan for a Digital Garden City Nation (revised version)**

### Deliberation on the information and communications policies with a view to 2030

- The General Policy Committee, Information and Communications Policy Section of the Information and Communication Council **backcast** the international competitiveness of Japan’s information and communications industry, and the safe and secure utilization environment **from the projected future in 2030** and discussed the ideal direction of the information and communication policies in 10 years. The committee compiled and published its **final report “Information and communications policies with a view to 2030”** in June 2023.

## Telecommunications business policy

### Developing and maintaining digital infrastructure and securing its security and reliability.

- Developing optical fibers toward achieving the goal (household coverage rate of optical fiber: 99.9% at the end of fiscal 2027) of the **Infrastructure Development Plan for a Digital Garden City Nation** and **supporting the decentralization of datacenters and submarine cables** by using the **Digital Infrastructure Development Fund**. Holding the **Study Group on Intercarrier Roaming in Emergency Situation** to discuss the mutual use of networks among carriers in emergency situations.

### Development of a safe and secure utilization environment

- Promoting the development of consumer protection rules, **response to illegal/harmful information and dis/misinformation** on the internet and other efforts.

## Radio policy

### Spread and dissemination of 5G

- Toward achieving a goal (population coverage rate of 5G: 97% nationwide at the end of fiscal 2025) of the **Infrastructure Development Plan for a Digital Garden City Nation**, promoting the spread of 5G by providing subsidies and tax benefits, and implementing initiatives to promote infrastructure sharing.

## Broadcasting policy

### Deliberation on the vision of future broadcasting and the ideal broadcasting system

- Based on the recommendations, etc. of the **Study Group on the Ideal Broadcasting System in the Digital Age**, MIC is promoting the shared use of equipment, reviewing the principle of decentralization of media and developing systems to enable identification of broadcasting programs in multiple regions

### Toughening of broadcast networks and enhancing disaster resistance

- Promoting the development of an environment for the sure delivery of information in times of disaster by enhancing the disaster-resilience of the broadcast network through the conversion of cable television to fiber optics

## Cybersecurity policy

### Securing the safety and reliability of information and communications networks

- In order to create an environment for the citizens to use ICT with security, MIC promotes activities to ensure the security of IoT devices, telecommunications carriers' initiatives for detection of C&C servers and initiatives to address supply chain risks

### Developing Cybersecurity human resources

- Promoting the development of cybersecurity human resources through NICT National Cyber Training Center (e.g., CYDER)

## Promotion of use of ICT

### Promoting the use of ICT contributing to solving social/economic issues

- Promoting **Local 5G**, the spread of telework and ICT utilization in education, medical care and other fields

### Creating an environment where everyone can enjoy the convenience of ICT

- **Promoting initiatives to bridge the digital divide toward digitalization that leaves no one behind** (e.g., support for the elderly to use digital technology, support for barrier-free information) and **considerations/efforts to improve literacy for the use of ICT**

## ICT technology policy

### R&D, implementation and international standardization toward Beyond 5G

- Toward the realization of Beyond 5G (6G), that is the next-generation information and communications infrastructure, the ministry **vigorously promotes R&D aimed at social implementation and overseas expansion with a focus on the technology fields where Japan has strengths**, while at the same time promoting the **international standardization** of Beyond 5G (6G) in collaboration among industry, government and academia.

## Global strategy for ICT

### Contribute to the strengthening of Japan's international competitiveness in the ICT sector and the solving of global social issues

- In order to contribute to the strengthening of Japan's international competitiveness in the ICT sector and the solving of global social issues, MIC promotes the **overseas expansion of digital infrastructure, etc.** and **bilateral and multilateral collaboration** (e.g., Japan-US, Japan-EU, QUAD, G7 and IGF) **in digitalization**
- At the **G7 Digital and Tech Ministers' Meeting** in April 2023, participants discussed six themes, including "Secure and Resilient Digital Infrastructure," "Maintaining and promoting a free and open Internet", and "Promotion of Responsible AI and Global AI Governance," etc. The ministers **adopted "G7 Digital and Tech Ministers' Declaration"** as a result of the meeting.

## Postal service administration

### Reviewing regional contribution by post offices in a digital society

- Discussing measures for the spread and utilization of personal number cards in post offices, promoting the utilization of post offices as a counter for administrative services, and implementing demonstration projects on collaboration among post offices with public infrastructure in the region.