

Tentative
Translation

Report 2021 (Overview)

Promoting “Safe, Secure, and Trustworthy Implementation of AI in Society”

4 August 2021

The Conference toward AI Network Society

Structure Of The 2021 Report

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Chapter 1. Recent Trends In AI Networking (1)

Note: List of key items

Domestic Trends

○ AI Strategy 2021 (Follow-up to “AI Strategy 2019”) (Decided by the Integrated Innovation Strategy Promotion Council on June 11, 2021)

- Establishing seven “Social Principles of Human-Centric AI” for the social framework of an AI-ready society in Japan.
- In order to implement the AI social principles, we will consider the ideal form of AI governance in Japan, such as regulations, standardization, guidelines, audits, that can contribute to strengthening Japan’s industrial competitiveness and improving the social acceptance of AI, while keeping an eye on domestic and international trends.

○ Council of Social Principles of Human-Centric AI

The Cabinet Office has re-established the “Council of Human-Centered AI Social Principles” and has held three meetings between December 2020 and May 2021. In past meetings, opinions were exchanged on issues regarding domestic and international AI trends, points to be borne in mind during discussions, and the future of AI regulations.

Overseas Trends

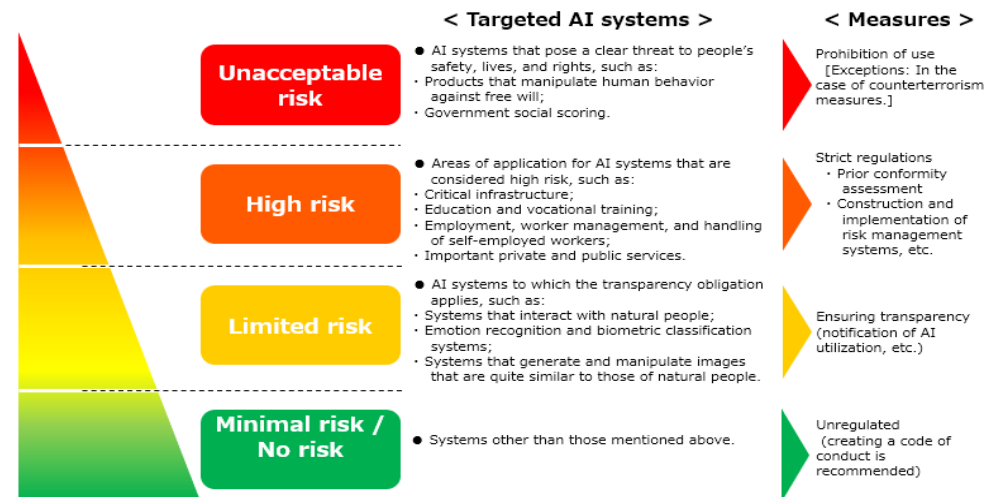
○ Publication of the EU “Proposal for a Regulation laying down harmonised rules on artificial intelligence” (April 21, 2021)

In order to form an ecosystem of trust through a legal framework for reliable AI, the risks of AI systems were classified into four types using a risk-based approach, based on the purpose and application, and regulations were introduced according to each risk (see the figure on the right). In addition, providers and users in third countries that launch AI systems in the EU and provide AI system deliverables are also subject to regulations on high-risk AI.

○ “Aiming for truth, fairness, and equity in your company’s use of AI” of the US Federal Trade Commission Act and other laws (April 19, 2021)

The Federal Trade Commission (FTC) has updated its blog and warned against using AI, saying that biased use of AI could violate the Federal Trade Commission Act, the Fair Credit Reporting Act, and the Equal Opportunity for Financial Assistance Act.

The FTC pointed out that AI could reflect problematic racial and gender biases, and that the FTC may intervene if biased tools are used in areas such as housing and employment, or if these are advertised as unbiased or trained on data collected in a misleading manner.



Chapter 1. Recent Trends In AI Networking (2)

Trends in international discussions

Note: List of key items

○ OECD Committee on Digital Economy Policy (November 24, 2020, and April 15, 2021)

- Report on the activity status of each working group (1- AI classification, 2- Trustworthy implementation of AI, and 3- Practical guidance for recommendations to the government about implementation) established under ONE AI (OECD Network of Experts on AI) based on reports of each working group. From Japan, explanation of the "2020 Report" (November 24, 2020).

At a later date, comments on the reports of each working group were submitted by members of this Promotion Council and the AI Governance Review Committee, as well as by the government.

- Presentation on the activities of each working group and exchange of opinions relating to it. Japan provided information on the international symposium, "Global Forum on AI Network Society Towards an AI-Ready Society" and presented its stance on continuing to promote "safe, secure, and trustworthy implementation of AI in Society" (April 15, 2021).

○ GPAI (Global Partnership on AI) Plenary Meeting (December 3-4, 2020)

Each working group (1- Responsible AI, 2- AI and response to the pandemic, 3- Data governance, 4- Work future, and 5- Innovation and commercialization) reports on the review status, and a closed steering committee and a ministerial council meeting are held. The report published by the "1- Responsible AI" working group summarizes the various efforts by industry, academia, the private sector, and the government to promote R&D and utilization of AI; divides them into the three categories of "AI and ethics," "AI and governance," and "AI and social good"; and creates a catalog.

One of the 30 promising examples of initiatives that have gone through the evaluation process is the publication of the "The Draft AI R&D GUIDELINES for International Discussions" compiled by this Promotion Council.

AI Network Society Forum

○ International Symposium "Global Forum on AI Network Society Towards an AI-Ready Society" (March 1, 2021)

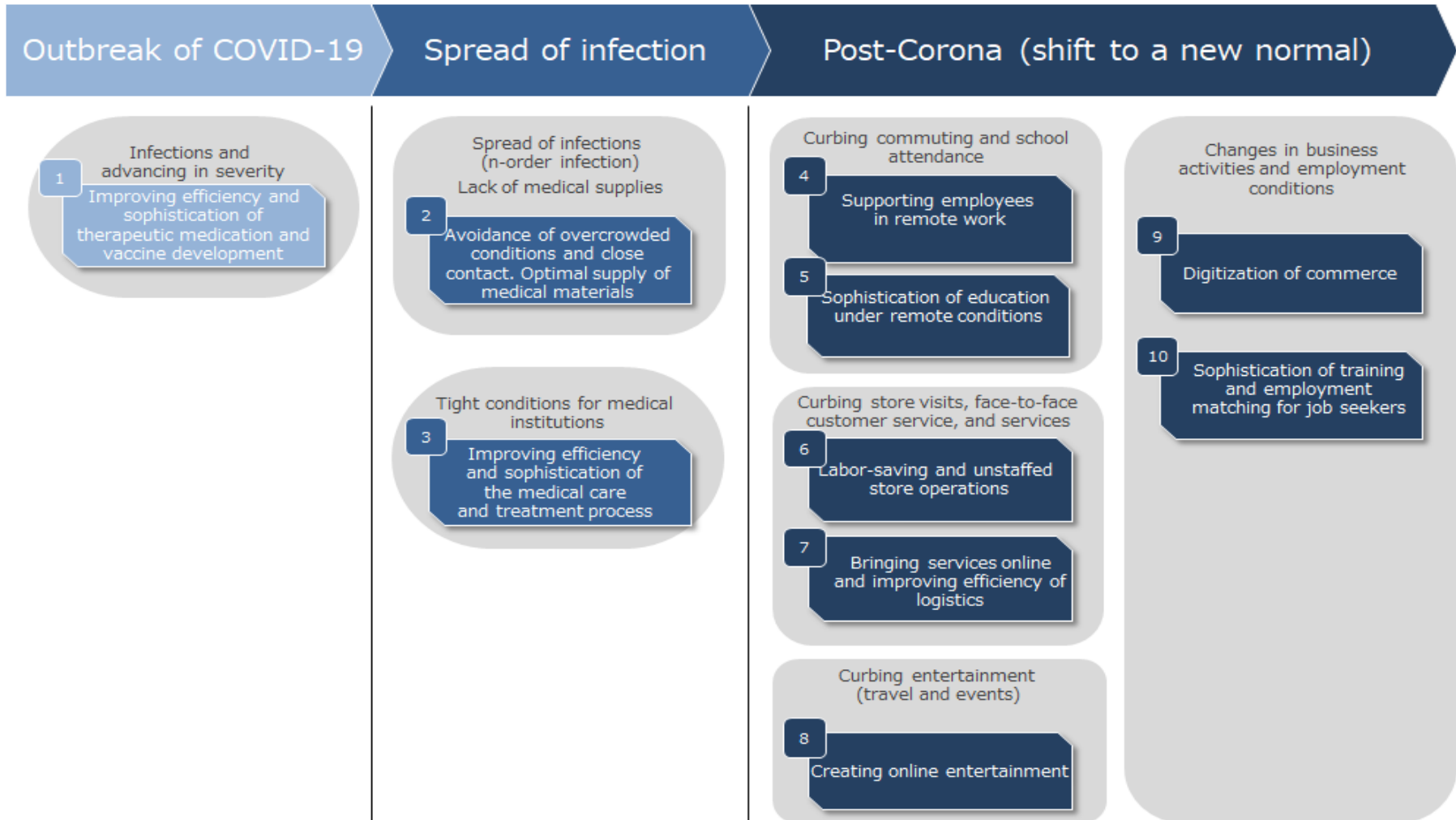
The Ministry of Internal Affairs and Communications hosts the " **Global Forum on AI Network Society Towards an AI-Ready Society** " with the aim of contributing to the resolution of social issues through discussions on the arrival of the future AI society and data economy, and discussions on the possibility of utilizing AI to counter the problems caused by COVID-19, which is spreading worldwide. In addition to the members of the Promotion Council and the Committee on AI governance, together with representatives of the OECD, experts and business leaders from a wide range of fields in Japan and overseas participated and exchanged opinions.

- There were opinions on the macroeconomic potential of AI and data, the direction of efforts to promote its utilization, and the importance of learning ethics and social sciences for AI developers.
- Given the impact of COVID-19, discussions were held on topics such as the need to change the current mindset, develop human resources, and promote educational reforms for the transition to the "post-corona" era in order to realize effective utilization of technology, and the need to work on governance structures that emphasize AI ethics for AI implementation in society.

Chapter 2. COVID-19 And Utilization Of AI (1)

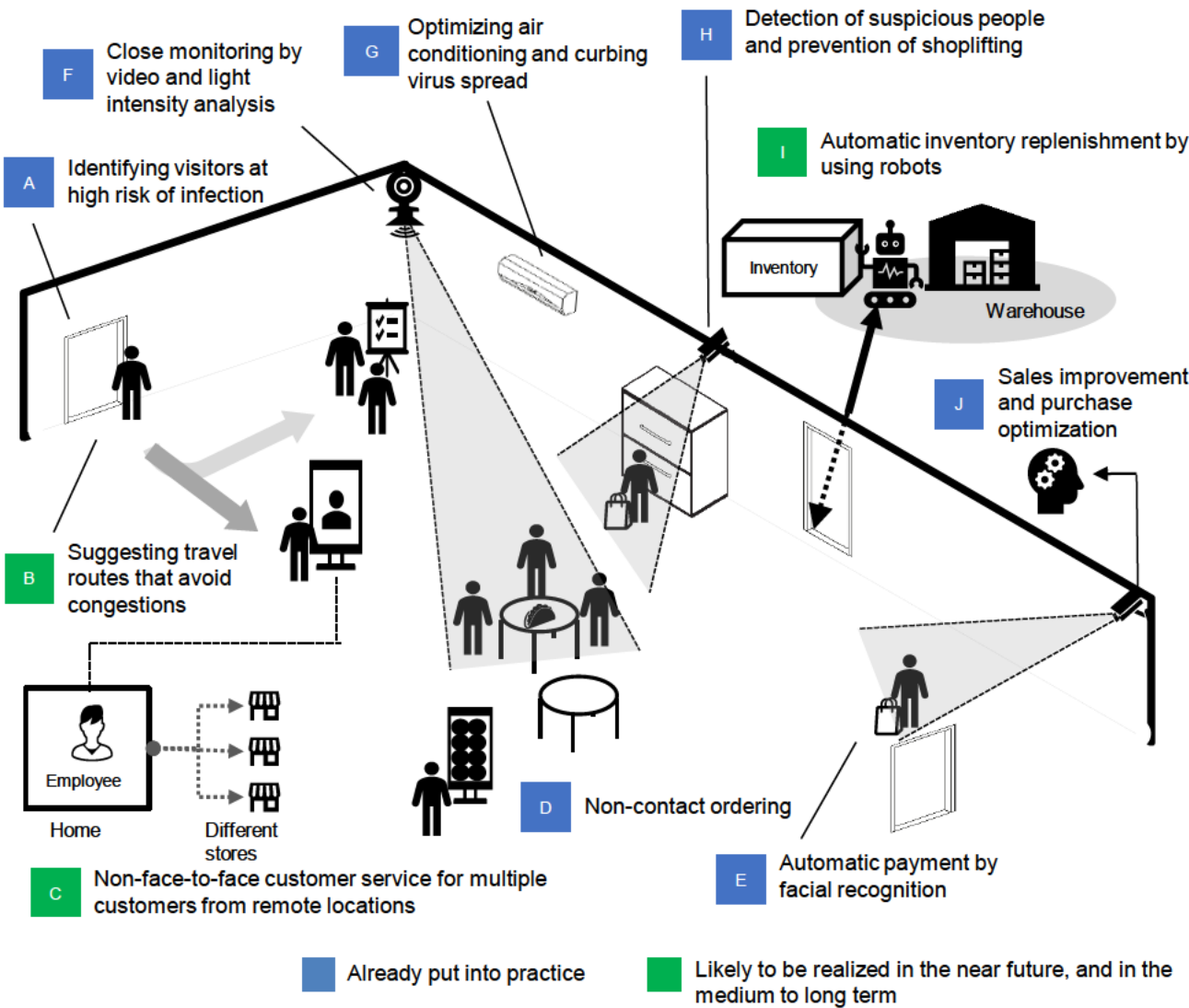
Prospects for the utilization of AI following the spread of COVID-19

In considering the prospects for AI utilization following the spread of COVID-19, we divided the situation into three stages: “outbreak of COVID-19,” “spread of infection,” and “post-corona (shift to a new normal)”. Then, after grouping the impacts on society and the economy in each stage, we put together case studies assuming the AI utilization corresponding to them.



Chapter 2. COVID-19 And Utilization Of AI (2)

<(6) Case studies of labor-saving and unstaffed store operations>



- A** Identifying visitors at high risk of infection
 - Analyzing camera images to determine body surface temperature and whether the person is wearing a mask

- B** Suggesting travel routes that avoid congestions
 - Using camera images to identify congestions and suggesting travel routes with low risk of infection

- C** Non-face-to-face customer service for multiple customers from remote locations
 - Customer service through digital signage in multiple stores simultaneously

- D** Non-contact ordering
 - Measuring the distance between the device and the person's finger and allowing contactless ordering without touching the screen

- E** Automatic payment by facial recognition
 - Identifying the person who is leaving the store by camera image and automatically settling the payment of the service purchased or used

- F** Close monitoring by video and light intensity analysis
 - Using camera images to grasp differences between overcrowded and comfortable work environments and notifying employees

- G** Optimizing air conditioning and curbing virus spread
 - When it is discovered that a visitor is infected, the air is automatically replaced to prevent the virus from spreading within the store

- H** Detection of suspicious people and prevention of shoplifting
 - Using camera images to predict people's behavior, detect suspicious people, and prevent shoplifting

- I** Automatic inventory replenishment by using robots
 - Grasping inventory status and having robots automatically replenish the inventory

- J** Sales improvement and purchase optimization
 - Analyzing customer information, sales results, etc., and proposing measures to improve sales and optimize purchasing

Note 1: Some examples of possible utilization are described
 Note 2: The possibility of utilization is described in view of the current system
 Note 3: Items that were used or assumed to be used before the spread of COVID-19 infections, but are considered effective and useful as countermeasures against COVID-19, are also described

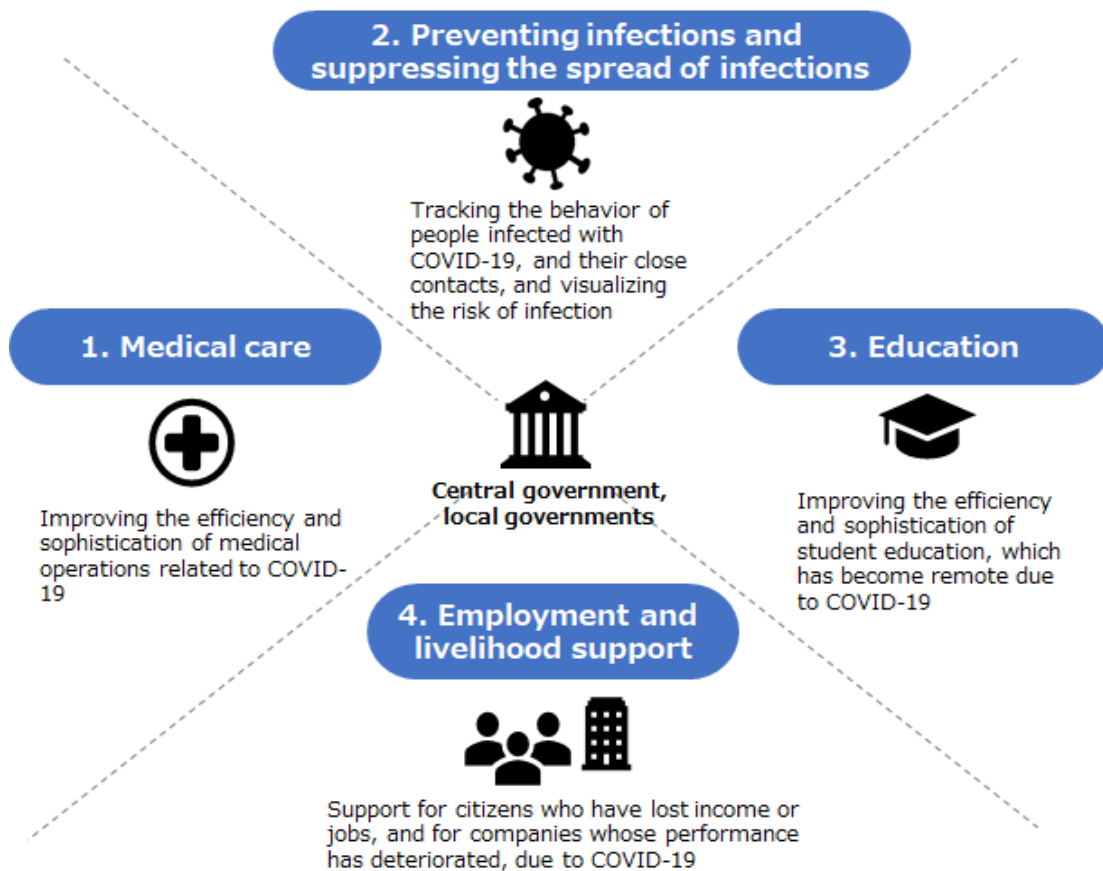
Chapter 2. COVID-19 And Utilization Of AI (3)

International comparison of AI utilization in response to COVID-19

As COVID-19 continues to spread around the world, common examples of AI utilization have been found in several countries and regions, reflecting the efforts of central and local governments to counter COVID-19 using AI.

< Target countries and regions > Japan United States United Kingdom France Germany Estonia Finland China South Korea Singapore Israel Taiwan

Key roles of central and local governments in the fight against COVID-19



Case studies of AI utilization

- 1 Medical care**

 - Forecasting the number of people infected with COVID-19
 - Vaccine development and scrutiny of adverse reaction information
 - Analysis of CT images
 - Chatbot support for consultations on COVID-19
- 2 Preventing infections and suppressing the spread of infections**

 - Tracking citizens' behavior using contact confirmation and tracking apps
 - Visualizing overcrowded conditions in public facilities and tourist sites
 - Predicting congestion on public transportation
- 3 Education**

 - Applying adaptive learning based on students' level of understanding
 - Providing digital content for learning AI online
- 4 Employment and livelihood support**

 - Providing job opportunities to unemployed job seekers
 - Improving the efficiency of loan procedures for companies with declining business performance
 - Chatbot support for inquiries related to procedures





Chapter 2. COVID-19 And Utilization Of AI (4)

International comparison of AI utilization in response to COVID-19

(Initiatives related to contact confirmation and tracking apps)

Relatively large differences between countries and regions were observed with regard to the use of AI for “prevention of infection and control of the spread of infection” (contact confirmation and tracking app).

- Degree of government coercion: Is the use of the app compulsory? Are people penalized for violating the regulation? As a result, what kind of personal information does the government have access to? What is the tolerance level of citizens regarding the collection of personal information by the government?
- Scope of collected data: Does the data to be collected include only information on whether the user has been in close contact with others for a certain period of time, or does it also include location information, purchase data, etc.?
- Scope of AI utilization: Is it only for contact determination (no AI utilization) or does it include AI analysis of collected data?

	Types of utilization	Purpose	Collected data	Degree of government intervention	Applicable country/region
Required (mandatory)	Required for all citizens 	<ul style="list-style-type: none"> Encouraging early detection, isolation, diagnosis, and treatment of infected people through thorough contact confirmation and tracking. 	<ul style="list-style-type: none"> Location information Purchase information Camera image information Medical data 	<ul style="list-style-type: none"> The government gathers information and uses it for making predictions using AI. 	China
	Required for isolated people / foreign travelers 	<ul style="list-style-type: none"> Tracking the behavior of infected people and those in close contact, and facilitating early detection, isolation, diagnosis, and treatment of infected people. 	<ul style="list-style-type: none"> Location information (South Korea and Taiwan) Purchase information (South Korea) Camera image information (South Korea) 	<ul style="list-style-type: none"> The government gathers information and uses it for making predictions using AI. In South Korea, penalties are imposed for refusing to follow hospitalization recommendations. In Taiwan, penalties are imposed for refusing to quarantine. 	South Korea, Taiwan
Voluntary (not mandatory)	Optional (there are disadvantages) 	<ul style="list-style-type: none"> Preventing the spread of infection by checking and tracking the behavior of users who have installed the contact confirmation and tracking app. 	<ul style="list-style-type: none"> Location information 	<ul style="list-style-type: none"> The government is asking people to present the app at shopping malls and other places. In Singapore, citizens can be ordered to provide personal information for epidemiological studies. 	United Kingdom, Singapore
	Optional (no disadvantages) 	<ul style="list-style-type: none"> The contact confirmation and tracking app will present the risk of infection and discourage unnecessary behavior by the public. 	<ul style="list-style-type: none"> Anonymous code for infected people 	<ul style="list-style-type: none"> There is no disadvantage associated with non-use, and individuals are free to choose. Individuals are not identified. 	Japan, United States, France, Germany, Estonia, Finland, Israel

Note: contact confirmation and tracking apps may not necessarily use AI systems. However, we cover cases where AI systems are not directly used because these are a form of utilization that analyzes and makes decisions based on acquired data, and are considered to be an important model case for international comparisons.

Chapter 3. Initiatives To Promote “Safe, Secure, and Trustworthy Implementation of AI in Society” (1)

Opinions were exchanged through presentations by business operators who are making advanced or ambitious efforts to implement AI in society. The main issues were:

- What kind of initiatives will developers and users (AI service providers and business users) adopt to promote “safe, secure, and trustworthy implementation of AI in society” or to improve the acceptance of AI in society?
- To promote these efforts, what issues do businesses face, and what should be done to resolve them?
- What kind of environment should be created to encourage acceptance and promote “safe, secure, and trustworthy implementation of AI in society”?

In addition, opinions were exchanged on the use of AI as a countermeasure against COVID-19.

○ Prof. Yasushi Okuno (Kyoto University Graduate School)	: Challenge of developing COVID-19 treatments using the supercomputer “Fugaku” and AI
○ Fujitsu Laboratories Ltd.	: Fujitsu's AI Research Activities in the New Normal
○ Google LLC	: Putting AI Principles into practice
○ National Institute of Information and Communications Technology	: Large-scale natural language processing technology aimed at solving social issues
○ NEC Corporation	: Toward a safe, secure, and trustworthy implementation of AI in society
○ NTT Communications Corporation	: Smart World realized by communication AI
○ Prof. Hidenori Kawamura (Hokkaido University Graduate School)	: Research case study and start-up at the Laboratory of Harmonic Systems Engineering, Hokkaido University
○ Institution for a Global Society Co., Ltd.	: Protection of personal information that accelerates data-based education with fair evaluation by AI. Human resources development and an education platform.
○ Aizuwakamatsu City	: The role of AI in “Smart City Aizuwakamatsu”
○ NTT DATA Corporation	: NTT DATA Group AI Governance Initiatives, 2021 update
○ Oki Electric Industry Co., Ltd.	: AI Risk Management of OKI
○ Sony Group Corporation	: Sony Group's AI Ethics Activities
○ Sumitomo Corporation	: DX Promotion and AI Utilization in the COVID-19 crisis by Sumitomo Corporation
○ LegalForce, Inc.	: Introduction of a contract review and management system using natural language processing
○ Legalscape, Inc.	: Efforts toward organizing legal information into web-like structure
○ Nippon Television Network Corporation	: Introducing the AI utilization case study and AI utilization promotion system of Nippon TV
○ NHK Science & Technology Research Laboratories	: Efforts to develop AI technology at NHK Science & Technology Research Laboratories
○ Toshiba Corporation	: Toshiba's AI Initiatives
○ FUJIFILM Holdings Corporation	: Regarding Fujifilm's AI development and application case studies and establishment of a basic AI policy
○ Japan Post Holdings Co., Ltd.	: Efforts to utilize technology in the postal and logistics fields
○ Stella Place Co., Ltd.	: Development of the AI weather prediction model in high-performance computing and the possibility of its application at the PC level
○ IBM Japan, Ltd.	: IBM Data and AI technologies to support enterprise-wide AI adoption
○ Hitachi, Ltd.	: Efforts toward the realization of an AI network society

Chapter 3. Initiatives To Promote “Safe, Secure, and Trustworthy Implementation of AI in Society” (2)

Initiatives related to AI Ethics and Governance

Initiatives related to AI ethics and governance by each business operator, etc. are organized from the perspectives of “guidelines and principles,” “organization and structure,” “security,” “privacy,” “fairness,” “transparency and accountability,” “appropriate use,” “quality assurance and development review,” and “cooperation and collaboration with external parties.”

< Key points of best practices >

	Initiatives being taken by many business operators, etc.	Particularly noteworthy initiatives
Guidelines and principles	<p>Many AI developers and service providers have formulated and established guidelines for AI governance, using Social Principles of Human-Centric AI, AI development guidelines, AI utilization guidelines *, etc. as a reference.</p> <p>⇒ It is desirable to formulate and establish guidelines, etc. according to the mode of AI utilization and the nature of AI, and to implement and operate them appropriately, while referring to the case studies (motivation, way of thinking, processes, etc.) presented in the hearings.</p>	<p>Establishing a basic policy for the utilization of AI as an AI user.</p>
Organization and structure	<p>Creating internal working groups and specialized teams, forming committees in collaboration with external experts, and establishing internal and cross-group organizations in order to implement and manage AI ethics and governance.</p> <p>⇒ It is desirable to establish an organization and system for the appropriate implementation and operation of AI ethics and governance, referring to the case studies presented in the hearings, etc. Case studies of creating systems that allow risk management related to AI to be accepted within companies without resistance by utilizing existing internal regulations and systems as much as possible are also considered to be helpful in building an organization and system.</p>	<p>Implementing initiatives that emphasize diversity, such as bringing together external researchers with different cultural backgrounds and incorporating perspectives from psychology and cognitive science.</p>
Security Privacy	<p>Implementing initiatives that emphasize security and privacy protection.</p> <p>⇒ While referring to the cases presented in the hearings, it is necessary to take appropriate measures to ensure security and privacy protection according to the mode of AI utilization and the nature of AI. From the perspective of privacy protection, it would also be helpful to consider case studies such as creating a mechanism that allows users to select whether or not to use the service, or to choose the personal information to be shared, after understanding the risks.</p>	<p>Implementing initiatives utilizing new technologies such as secure computation and blockchain.</p>
Fairness	<p>Emphasizing the need to ensure fairness and eliminate bias, and implementing initiatives to establish a system to check for bias and discrimination in the process of AI development and utilization.</p> <p>⇒ Appropriate efforts should be made to ensure fairness and eliminate bias in accordance with the mode of AI utilization and the nature of AI, referring to the examples presented in the hearings.</p>	

* “AI Development Guidelines” and “AI Utilization Guidelines”:
 “The Draft AI R&D GUIDELINES for International Discussions” (July 2017) and “AI Utilization Guidelines” (August 2019) compiled by the Promotion Council (same as below).

Chapter 3. Initiatives To Promote “Safe, Secure, and Trustworthy Implementation of AI in Society” (3)

Initiatives related to AI Ethics and Governance

< Key points of best practices > continuation

	Initiatives being taken by many business operators, etc.	Particularly noteworthy initiatives
Transparency and accountability	Implementing initiatives that emphasize transparency and accountability.	Implementing initiatives to gain understanding and acceptance through dialogue with stakeholders such as users, in addition to technical approaches in the form of “Explainable AI” (XAI) including the use of new technologies.
	⇒ While referring to the case studies presented in the hearings, etc., it is necessary to take appropriate measures to ensure transparency and achieve accountability according to the mode of AI utilization and the nature of AI.	
Appropriate use	Positioning AI as a tool for humans to use, and implementing the so-called “human in the loop” operation, in which humans ultimately confirm the AI judgment and have AI as a support, rather than leaving everything to AI judgement.	
	⇒ “Human in the loop” is closely related to privacy, fairness, transparency, and accountability, and is a very important point of view when considering the relationship between humans and AI. While referring to the case studies presented in the hearings, it is desirable to appropriately utilize the mechanism to realize "human in the loop" depending on the mode of AI utilization and the nature of AI.	
Quality assurance and development review	Establishing processes and rules for conducting quality assurance and evaluation of AI, including development of evaluation processes throughout the lifecycle, development of tools such as checklists, and creation of templates for contracts.	Efforts to ensure AI ethics and avoid risks from the previous stage of design by formulating development standards, and efforts to continuously operate AI model data and applications while cooperating mutually. Implementing “by design” initiatives for AI ethics and governance by incorporating AI ethics and governance into development methods, etc.
	⇒ It is desirable to promote initiatives to appropriately implement quality assurance and evaluations, referring to the case studies shown in detail in the hearings with regard to initiatives such as quality assurance.	
Cooperation and collaboration with external parties	Actively cooperate and collaborate with the government, related organizations, external experts and intellectuals, etc., deepening the efforts of business operators themselves and contributing to the promotion of social implementation of AI.	
	⇒ It is desirable to actively cooperate and collaborate with the outside world, referring to the case studies presented in the hearings, and promote the social implementation of AI by multiple stakeholders.	

Chapter 3. Initiatives To Promote “Safe, Secure, and Trustworthy Implementation of AI in Society” (4)

Initiatives related to AI Development and Utilization

Among the initiatives for AI development and utilization taken by each business operator, we have organized efforts related to “countermeasures against COVID-19,” “medical and healthcare,” and “the elderly and people with disabilities” as fields that require special attention, given that the spread of COVID-19 continues, and that it is important to disseminate information internationally as a country that has faced issues in advance.

< Key points of best practices >

	Initiatives being taken by many business operators, etc.	Particularly noteworthy initiatives
COVID-19 measures	As AI-based countermeasures against COVID-19, implementing initiatives such as avoiding overcrowded conditions and close contact, and providing chatbot services.	AI-based drug discovery attempts are being implemented, and there are great expectations that these will shorten the time and cost of drug development.
	⇒ It is desirable to continue to promote initiatives for COVID-19 countermeasures that utilize AI, while referring to the cases presented in the hearings about the status of COVID-19 infection spread. In addition, in the new normal, issues such as improving the management structure and maintaining supply chains are also expected to be resolved by utilizing AI.	
Medical and healthcare		Utilizing AI to support diagnoses by doctors and prevent lifestyle-related diseases
	⇒ It is desirable to promote initiatives to utilize AI in the medical and healthcare fields, referring to the case studies presented in the hearings. Specifically, in a situation in which the COVID-19 infections continue to spread, it is expected that the utilization of AI will promote initiatives to reduce the number of patient visits to hospitals, propose optimal treatments for individuals, reduce the burden on medical sites, and economize the labor force.	
The elderly and people with disabilities		Implementing initiatives to support the elderly and people with disabilities by utilizing AI in the nursing care and broadcasting fields.
	⇒ It is desirable to promote initiatives to use AI to support the elderly and people with disabilities, referring to the cases presented in the hearings.	

Initiatives related to Human Resource Development

As the shortage of human resources related to AI has been pointed out, and the training and securing of human resources has become an issue, we summarize the initiatives taken by each business operator regarding human resource training.

< Key points of best practices >

	Initiatives being taken by many business operators, etc.	Particularly noteworthy initiatives
	Human resource development using e-learning and online resources, and implementing human resources development after establishing collaboration with universities and dividing levels in detail.	Initiatives to provide AI literacy education to the outside world have been implemented, and we hope that such initiatives will lead to raising the levels of AI literacy for business partners and the industry as a whole.
⇒ Human resource development is an urgent issue, and it is desirable to strongly promote initiatives to develop and secure AI human resources, referring to the examples presented in the hearings.		

Future Initiatives

< AI Ethics and Governance >

- Disseminating and sharing case studies on initiatives
 - It is important to disseminate and share case studies on the initiatives taken by each business operator, etc., and promote activities to disseminate and share these in cooperation with external stakeholders.
(It is especially important to expand the scope of activities to users and user groups, and to exchange opinions.)
- Dissemination and sharing of The Draft AI R&D GUIDELINES for International Discussions and AI Utilization Guidelines
 - In addition to disseminating and sharing case studies of the initiatives taken by business operators, etc., it is necessary to continue promoting activities to disseminate and share AI development guidelines and AI utilization guidelines.
- Review of The Draft AI R&D GUIDELINES for International Discussions and AI Utilization Guidelines
 - It is important to review the AI Development Guidelines and AI Utilization Guidelines, and consider revising their positioning, scope, and principles as necessary.
- Following and disseminating information on domestic and international trends and international discussions
 - It is important to follow up domestic and international trends as well as trends in international discussions, and disseminate information on case studies of the initiatives taken by business operators, etc. in international discussion forums, including multilateral forums, such as the OECD and GPAI, as well as bilateral policy dialogues, while taking Japan's industrial structure into consideration.
 - It is important to conduct research on the EU regulatory proposals, taking into account trends in international discussions.

< AI Development and Utilization >

- Disseminating and sharing case studies of initiatives
 - It is important to disseminate and share case studies of the initiatives taken by each business operator, etc., and promote activities to disseminate and share these case studies in cooperation with external stakeholders.
- Disseminating information in international discussions
 - It is important to disseminate information on the initiatives of each business operator, etc. in international discussions.

< Human Resource Development >

- It is important to continue to promote initiatives for human resource development, referring to the cases presented in the hearings.
- It is important to promote initiatives in cooperation with external educational and research institutions, etc., in order to deepen the initiatives of businesses and contribute to raising the level of society as a whole.
- It is important to implement human resource development initiatives not only for the private sector, but also for employees of ministries and agencies, as well as local governments.