

Tentative
Translation

The Conference toward AI Network Society 2020 Report (Outline)

Institute for Information and Communications
Policy (IICP), MIC

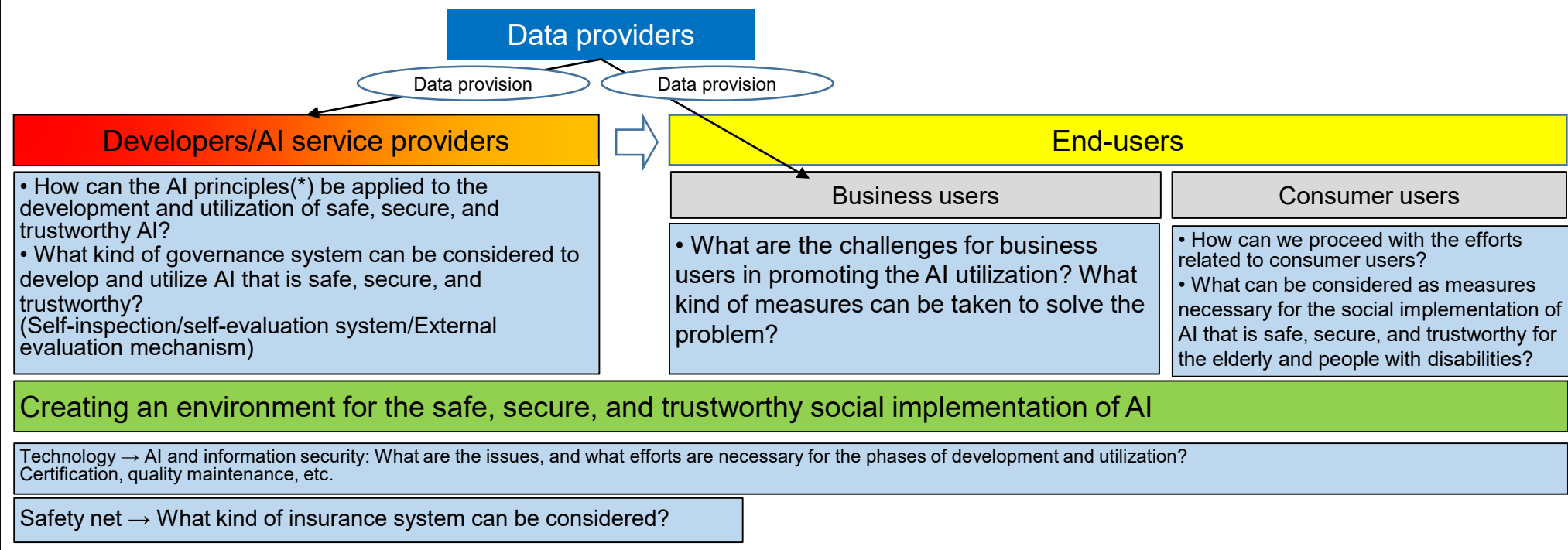
The Conference toward AI Network Society issued

- the Draft AI R&D Guidelines for International Discussions (2017)[1], which summarized items that AI developers are expected to take into consideration, and
- the AI Utilization Guidelines (2019)[2], which summarized items that AI users are expected to take into consideration.

These are compiled as non-regulatory and non-binding soft law and are consistent with international discussions such as those at the Organisation for Economic Co-operation and Development (OECD).

For promoting the development and utilization of AI and the excellent progress of AI networking, it is essential to eliminate the anxiety of people about AI and promote efforts to build trust. The Conference is continuously studying the safe, secure, and trustworthy social implementation of AI. (A report including the study was issued in July 2020).

Toward promoting the safe, secure, and trustworthy social implementation of AI



* "AI principles" are a generic term, which includes AI Principles, AI Guidelines and AI Commitment, etc.

Opinions were exchanged with businesses and experts who are enthusiastic about AI based on the issues listed on the previous page regarding the “safe, secure, and trustworthy social implementation of AI”. The summary of the report is as follows:

Efforts by developers and AI service providers

- The establishment of the AI principles by companies indicates their basic policy for the AI development. For their corporate stakeholders, it will eliminate concerns about AI development and will build their confidence in AI development efforts.
- In applying the AI principles to actual AI development and utilization, it is essential to formulate a checklist based on the AI principles from the perspective of ensuring the objectivity, uniformity, and verifiability of AI development/utilization judgment methods.
- Governance is required to ensure the implementation of AI principles. For self-inspection/self-assessment for a governance system, devised efforts can be seen, such as the establishment of an internal committee composed of various external human resources.
- It is necessary to formulate a collection of AI utilization best practices that introduce the usefulness of AI utilization in an easy-to-understand manner.

End-users' initiatives

Business users

- It will be useful for companies to make decisions on AI utilization in the future by organizing and accumulating ideas about the principles in concrete cases.
- It is necessary to work on the formulation of AI utilization best practices that will serve as a reference for efforts to utilize AI.
- Laws, ethics, and stakeholders related to AI business are widely diversified, and there is a high possibility that risks will occur if we proceed in the same way as conventional businesses. A future task is to establish a governance system to discuss legal and ethical issues with stakeholders.

- In the future, it will be necessary for consumers to use AI with peace of mind and to enjoy its benefits.
- It is one of the essential efforts to realize a human-centered AI society where older people and people with disabilities as consumer users can utilize AI to eliminate the inconvenience associated with aging or disability so that everyone can achieve self-fulfillment equally.
- Although the use of products, such as smart speakers, is an individual choice, it is necessary to have them aware of how to use them.

Initiatives for security-related risks

- It is necessary to consider technical measures as part of environment development for safe, secure, and trustworthy AI. For example, there are various efforts, such as quality maintenance, improvements in explainability, authentication, and security maintenance.
- There are four types of the relationship between AI and security: (a) Attack using AI, (b) Attack by AI, (c) Attack to AI, and (d) Measure using AI. It is necessary to consider each viewpoint.
- There are problems that cannot be solved by technical aspects alone, it is important to continue holding interdisciplinary discussions, not only with security engineers but also with psychology and sociology experts, etc.

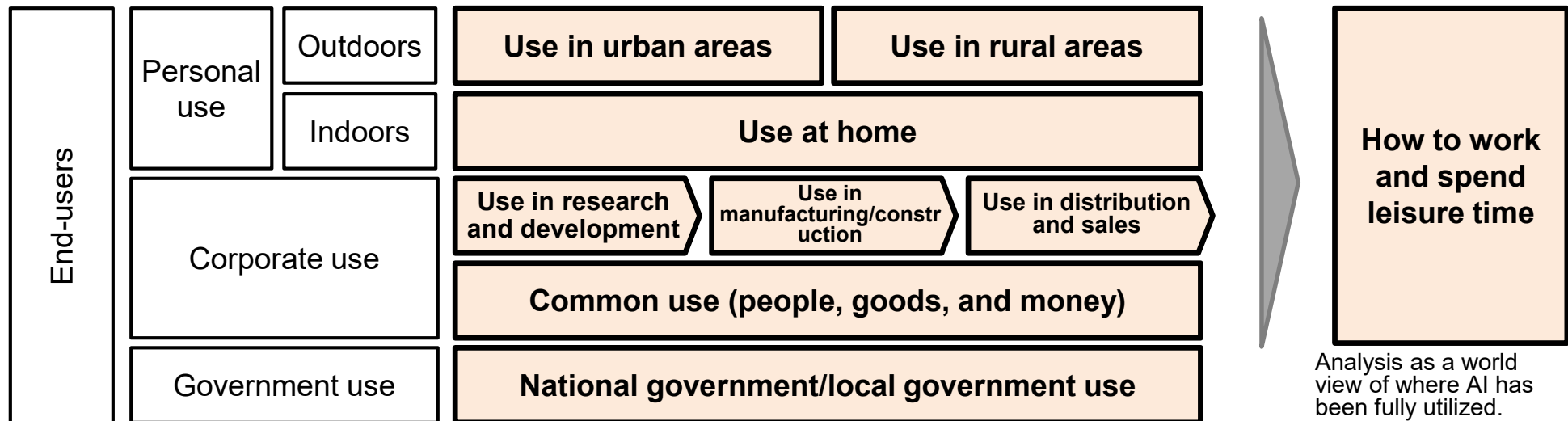
Initiatives for insurance

- With consideration of the characteristics of AI, it is crucial to have an insurance system to compensate for damages related to its development and utilization as a safety net initiative to promote the safe, secure, and trustworthy social implementation of AI.
- It is essential to develop various insurance products as initiatives to establish a safety net for utilizing AI to compensate for damages with consideration of the risk characteristics of AI.
- It is crucial to promote the spread of AI by ensuring the quality of AI.

For promoting the “safe, secure, and trustworthy social implementation of AI”, it is beneficial to analyze and present a scenario of the future social image of the AI social implementation to share a concrete image. The Conference toward AI Network Society tried sharing a concrete image to analyze and present the future image of AI utilization from the perspective of the near future (around 2025) and the medium-term future (around 2035) based on the progress of AI utilization.

1) Focusing on the AI utilization and looking at the scene of the AI utilization in terms of both consumers and businesses. In the perspective of AI utilization, the utilization scenes are classified as follows:

<Classification of AI utilization scenes>



2) With consideration of the above (1) scene of utilization, some case studies on the social implementation of AI were conducted. Then the benefits and issues of the AI utilization were summarized.

- Case: Transfer (fully self-driving)
- Case: Health (medical care/nursing)
- Case: Finance
- Case: Crisis management (crime prevention, public infrastructure, and disaster prevention)
- Case: Manufacturing
- Case: Residential
- Case: Energy

Healthcare

- From DNA information, health information, and daily conversations, it will be possible to offer suggestions for improving lifestyles, preventing diseases, and improving mental health, as well as being able to receive medical treatment remotely at home.

Advice for maintaining health based on the results of DNA analysis by AI.

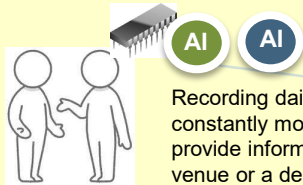


AI

Provision of content and proposals for actions for mental health understanding and improvements.



AI



Recording daily physical conditions in apps and constantly monitoring implant terminals or sensors to provide information voluntarily when going to a live venue or a department store or make an AI analysis.

AI

AI

Suggestion of watching over the elderly and children, replacing furniture and introducing auxiliary equipment by utilizing living information, and supporting independence of the elderly.



AI

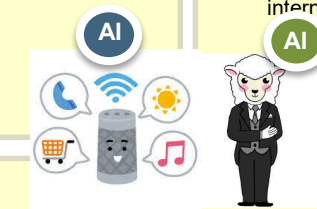
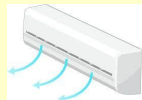
Providing entertainment content according to each user's preference.



AI

Automatically adjusts various environments in the room according to the resident's age, physical condition, and mood (temperature, humidity, smell, lighting, BGM, the height of chairs and beds, changes in the interior by holograms, etc.).

AI



Smart speakers and butler robots integrate and manage healthcare data and daily life data for use in various situations at home.

AI

AI

Housework

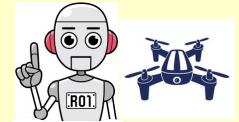
- In addition to automating almost all household chores, shopping can also be automated (automatic ordering by butler robots and automatic delivery to home by drone).



AI



Automatic ordering and delivery according to the stock status of ingredients and daily necessities using smart refrigerators.



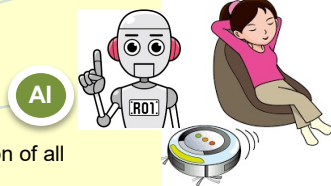
AI

AI

Automation of recipe suggestions based on health status and DNA analysis results, depending on consumer preferences and internal sensors.

AI

AI/Robot automation of all household chores.



AI

Daily conversation with AI that can communicate at the same level as human beings and give the advice to enrich various lives through conversation.

AI

AI

AI

AI



AI

Proposal of marriage partner image and asset management proposal according to personality.

AI



AI proposes side jobs and volunteer activities suitable for individuals based on career, schedule, and lack of resources around (utilize free time by automating housework).

AI



Safe and comfortable living environment

AI What has already been put to practical use/ Things that are likely to be realized shortly (by around 2025)

AI Medium term (up to around 2035)

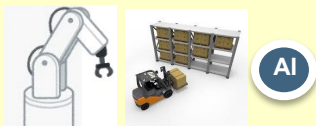
Lifestyle

(Note) Some examples of expected utilization are described. Examples are described with a view to the possibility of utilization without assuming the current system.

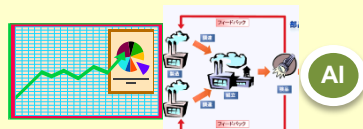
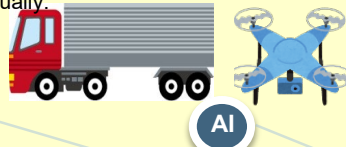
Logistics

- By utilizing AI, unattended warehouses, and crewless transportation can be realized. AI will also be used for overall distribution management, which will enable delivery services that are difficult to perform manually.

Unattended logistics operations in warehouses by utilizing AI-equipped robots and automated guided vehicles (AGVs).



Crewless transportation by realizing fully autonomous driving and delivery services that are not possible manually.



Management of entire distribution by AI (demand forecast, inventory adjustment, delivery route optimization, transportation resource arrangement, etc.).



Feedback based on customers' voices to AI and people in each value chain.



Personalized after-sales follow-up based on each customer's hobbies and preferences using AI (Apologies and sending of gifts, etc. according to the generation).



AI answers to questions and complaints by email and through chats and supports inquirers at call centers.

- AI will replace inquiries to call centers or by email and chats, and in the future, customer feedback will be automatically fed back to AI in each value chain.

After-sales service

AI What has already been put to practical use/ Things that are likely to be realized shortly (by around 2025)

AI Medium term (up to around 2035)

Advertisement

- By utilizing AI, it will be possible to make further improvements in the budget allocation and planning of advertisements, the customization of delivery contents to suit customers, and the measurement of advertising effectiveness.

AI's automatic generation of digital advertisements according to each customer's hobbies/preferences. (Changing the content and the people who appear in the advertisements according to the distribution destination.)

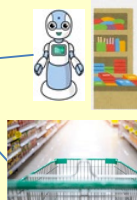


AI comprehensively measures the effect of advertisements based on the degree of SNS and blog coverages as well as the view rate and click rate.

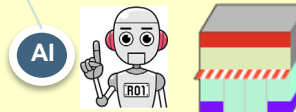
AI budget allocation and plan decisions (how much money to spend on which media, at what time, etc.).



Shoplifting prevention and trouble detection using AI cameras.



Shopping through remote control robots and shopping through virtual space experience.



A completely unattended store that utilizes AI, robots, RFID, etc. (stocking is also done automatically, and dynamic pricing with AI).



- AI is used to automate simple tasks in sales operations and simple customer service/guidance, etc., and people will handle troubles and other tasks where advanced customer service is required.

Sales

(Note) Some examples of expected utilization are described. Examples are described with a view to the possibility of utilization without assuming the current system.

Expected benefits (example)

- By making a DNA and lifelog analysis with AI, it will be possible to give detailed advice for improving the health according to the individual's health condition.
- An AI chip embedded in the body collects information on the body and analyzes it, enabling early detection of abnormalities and diseases.
- Image analysis using AI will lead to the early detection of illness and improvements in the prevention of oversight. It will also contribute to reducing the burden on doctors and solving problems, such as doctor shortage and uneven distribution.
- By expanding the physical capabilities of wearable robots (wearable robots and robot suits), older people with physical disabilities and care recipients can live independently.

Expected issues (example)

	Before realization	After realization
Society	<ul style="list-style-type: none"> • Considering the accuracy of AI diagnosis and people's trust in AI, if the diagnosis is left only to AI judgment, it may not be possible to obtain the patient's understanding. 	<ul style="list-style-type: none"> • Older people, their families, care workers, etc. may not be able to understand the proper usage of wearable robots fully.
Economy	<ul style="list-style-type: none"> • In the medical field, a high degree of medical knowledge is required to create training data, which may impose an excessive burden on doctors. 	<ul style="list-style-type: none"> • With the spread of wearable robots and AI chips embedded in the body, more learning data will be collected, which may create an oligopoly market.
Technology	<ul style="list-style-type: none"> • If the standardization of medical information/healthcare information system/data format does not make progress, the distribution of data, such as medical information, may be hindered, and AI training based on large-scale data may not progress. 	<ul style="list-style-type: none"> • There is a possibility that the AI system will become a black box, and medical doctors will not recognize or understand the risks of medical treatment using the AI system. Then no appropriate and sufficient informed consent will be provided to patients and families.
Law	<ul style="list-style-type: none"> • When handling personal information at prefecture/municipal hospitals, the Personal Information Protection Ordinance will be applied instead of the Personal Information Protection Act, which applies to the private sector. In the Ordinance, there are cases where there is a provision that prohibits information linking with external systems as a rule (prohibition of online linking), and there is a possibility that the cooperation and learning of data via the system will not proceed. 	<ul style="list-style-type: none"> • Regarding services that utilize information, such as life logs, there are cases where different individuals re-learn the information based on information input by smartphone. In that case, there may be an error in some personal data input, and a trained model that gives incorrect advice may be constructed. At that time, the legal demarcation point/responsibility ratio may be unclear between individuals and service providers.

(Note) Some examples of expected benefits and issues are listed.

Expected benefits (example)

- Humans will not need to drive, and travel time can be effectively utilized when traveling by car.
- Older people and people with disabilities will be provided with a convenient means of transportation, which will allow them to go to the hospital or go shopping smoothly.
- People will not need to drive long-distance trucks or long-distance buses at midnight or early morning, and they will be able to review their work style and work-life balance.
- In particular, problems such as a shortage of drivers for route buses in rural areas can be improved, and the abolition and reduction of routes can be avoided.

Assumed issues (example)

	Before realization	After realization
Society	<ul style="list-style-type: none"> • It is unclear whether self-driving is technically secure or who is responsible for accidents if any. Therefore, there is a possibility that the service will not be accepted due to people's feelings of resistance to autonomous driving. 	<ul style="list-style-type: none"> • The flow of using the time devoted to commuting and attending school for other purposes will be created. As a result, there is a possibility that the places and lifestyles of individuals will change significantly.
Economy	<ul style="list-style-type: none"> • In the case of infrastructure-coordinated autonomous driving, infrastructure may not be developed in local governments due to tight budgets, and there may be regional disparities in the spread of autonomous driving. • Employees related to delivery and transportation services may be reduced, making it difficult for them to find other jobs. Implementation of AI cannot be accepted socio-economic as a whole. 	<ul style="list-style-type: none"> • Automakers, which are becoming increasingly popular, can secure a lot of post-sales learning data, which may hinder the entry of newer automakers. • The lack of driving by humans could significantly reduce the accidents that have previously occurred as a result of human error and would require a significant change in automobile pricing for insurance.
Technology	<ul style="list-style-type: none"> • AI may behave unpredictably with respect to data not belong to the training data. In addition, even with using accurately trained AI (model), we may not avoid erroneous recognition and derecognition. 	<ul style="list-style-type: none"> • AI may not be able to respond to changes in the world after their deployment. • There is a possibility that proper operation cannot be performed because negotiations and adjustments cannot be made between cars. • If the AI system is hacked, not only will the autonomous vehicle not function properly, but it may also affect other autonomous vehicles via the network one after another, resulting in accidents and traffic disruptions.
Law	<ul style="list-style-type: none"> • The black-boxing of AI may make it difficult to establish the legal responsibility for autonomous driving, which may make it difficult to form a consensus with automobile manufacturers and users. 	<ul style="list-style-type: none"> • In addition to domestic legislation, coordination with other countries will be necessary, and it will not be possible to deal with the current legal system alone. Each automobile manufacturer may be forced to take new measures.

(Note) Some examples of expected benefits and issues are listed.