

AI Utilization Handbook

~ Using AI Wisely ~

Full Version



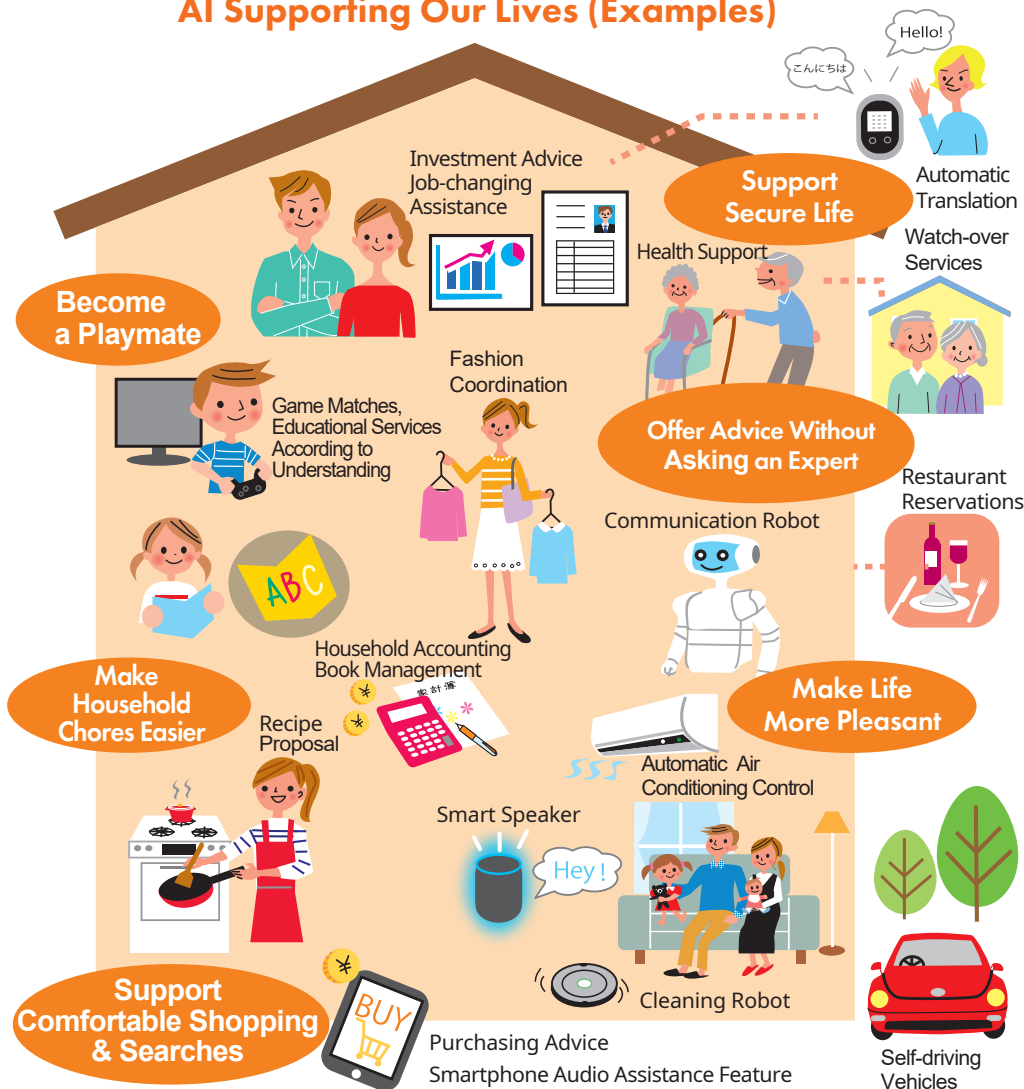
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AI around Us

There are many services and products that utilize AI around us, and they are also used in the mechanisms that support society. These AIs makes our lives safe and secure, and bring benefits and affluence.

AI Supporting Our Lives (Examples)



AI Supporting Society (Examples)



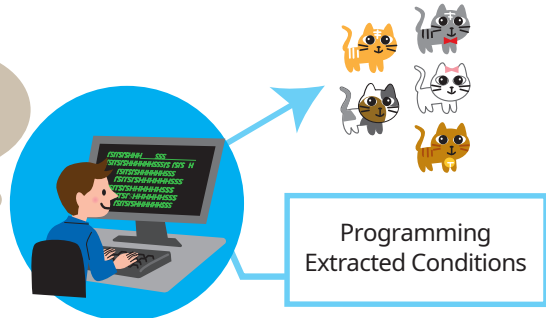
* Avatar: A character that appears in games or online as your own animated counterpart

The Benefits of AI

With systems up to now ...

There was a need for people to extract and program conditions (patterns) for pre-classification.

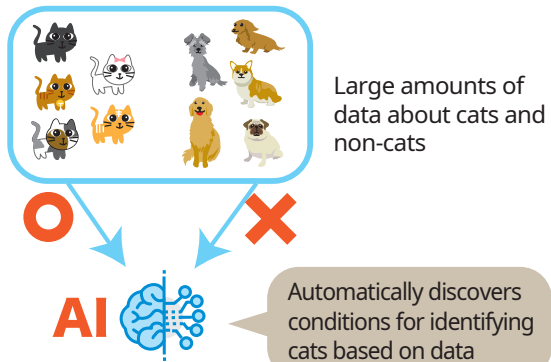
The conditions for identifying a cat are that it has two ears, triangular shape, eyes facing the front, and are large...



When Using AI ...

Computers can now analyze the given data and automatically discover the appropriate conditions (patterns) for classification.






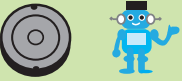
This allows complex analyses without having people set conditions and program them one at a time.



The Result ...

This makes it possible to make highly accurate decisions easily. Continuous learning of data has made it possible to produce analysis results that reflect changes in trends, when there are changes.

Using AI as human support allows us to use it as a good partner for a variety of situations.

Use Scenarios	Benefits
Automatically runs the air conditioning and adjusts room temperature and humidity depending on the presence or absence of resident 	<ul style="list-style-type: none"> • Offer comfortable living space. • Reduce power consumption and implement peak cuts/peak shifts.
Supports watch-over for children and the elderly 	<ul style="list-style-type: none"> • Allow guardians to go out with a sense of security. • Make it easier to work and participate community activities.
Recommends news and TV programs by a butler robot 	<ul style="list-style-type: none"> • Make news searching easier in busy time. • Enable TV program watching resident would want to see.
Automatically adjusts air conditioning and automates housework according to resident predicted time to come home 	<ul style="list-style-type: none"> • Offer resident more comfortable living space. • Make housework less burdensome.
Suggests recipes, orders ingredients, and automatically cooks based on personal preferences 	<ul style="list-style-type: none"> • Reduce the burden of housework. • Make it easy to select food with personal preferences and good for health.
Controls various appliances and robots via a butler robot 	<ul style="list-style-type: none"> • Control multiple robots and appliances at home using only the butler robot.

Prepared based the Conference toward AI Network Society Report 2018, Appendix 1

What is AI?

AI stands for "Artificial Intelligence".

A fixed definition of AI does not exist because research has been underway since the 1960s and as the technologies have advanced, the concepts indicated by AI have also evolved. However, because AI currently refers to machine learning essentially, "AI" is described as "machine learning" in this handbook.

Currently, AI (machine learning) generally includes the following characteristics (1) to (4).

(1) AI is a computer (or is a system that uses a computer).

- It is a system that analyzes input data using calculation formulas, and operates based on human-designed programs (instructions).

(2) It collects data and learns.

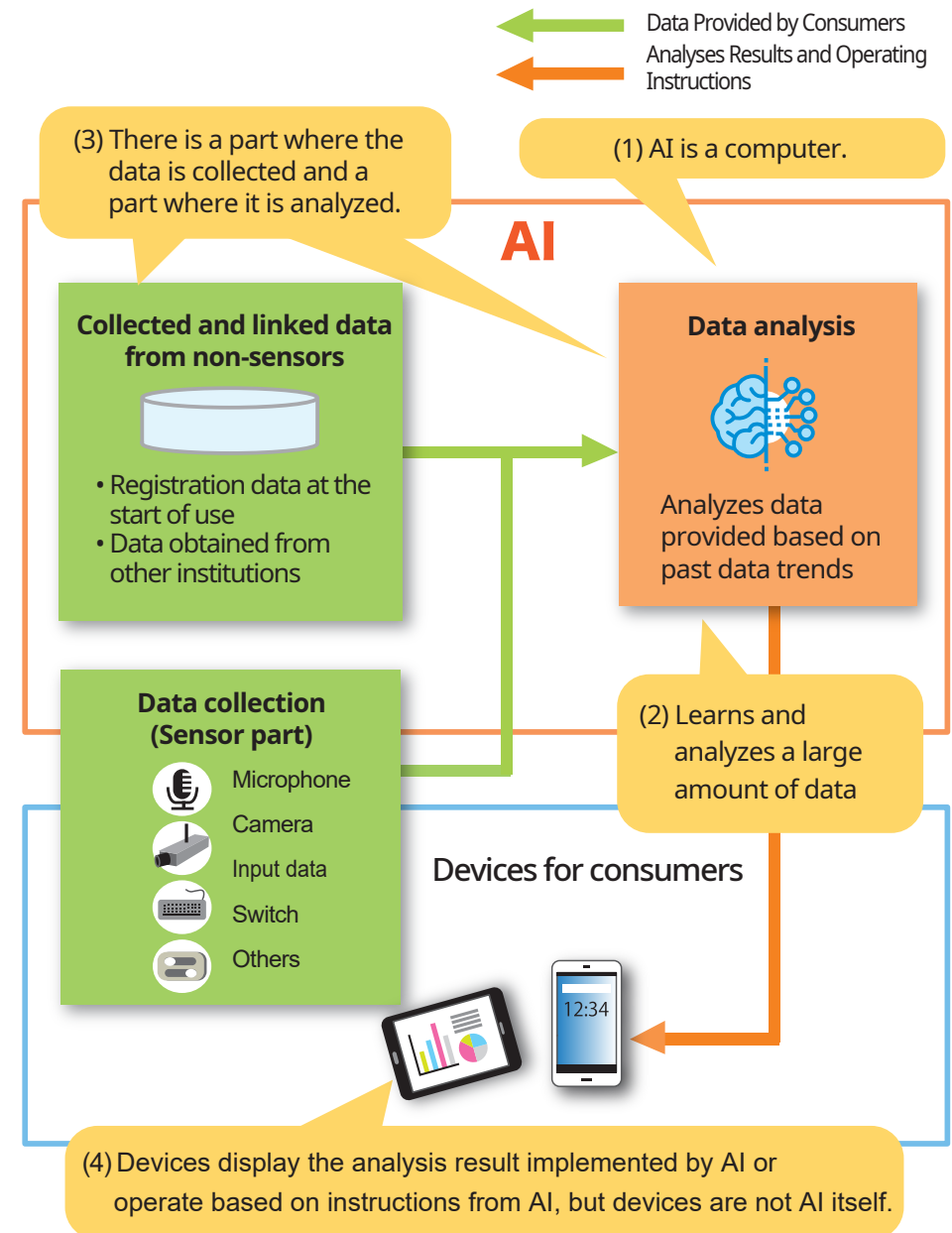
- When high-quality data are collected and accumulated, the program and analysis result accuracy are improved.

(3) There are sensor parts which collect data and thinking parts which are like the brain.

- It analyzes the data collected by sensor parts in conjunction with data from non-sensors in the brain part.

(4) AI is not a device (product).

- We see devices such as smartphones and speakers that provide apps and services, but AI is not limited only to those devices. AI is also located in a variety of places, such as servers that are connected online.



What you can do and cannot do with AI

AI makes our lives convenient, but it does not do everything. Use it based on its characteristics and limitations.

What AI has made possible

- Today's AI can analyze a variety of data, including images, languages, and sounds, not just numerical numbers.
- Now, AI can discover patterns (characteristics) overwhelmingly faster than humans and perform advanced analysis from a large amounts of diverse data.

What AI is good at and can do

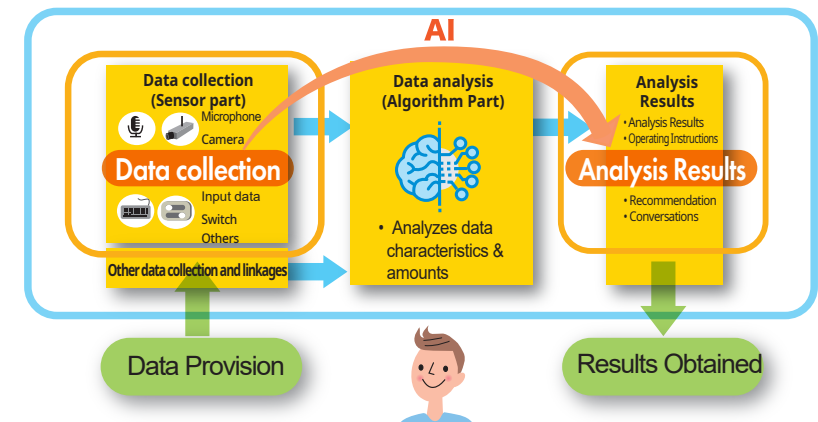
- (1) Works with clear rules and goals
 - It is said that AI is better at shogi (Japanese style chess) and chess than people in particular because it can examine numerous patterns instantaneously.
- (2) Works to collect and accumulate large amounts of data and perform complex calculations and analyses
 - For example, AI is good at face-recognition systems and anomaly detection that extract different patterns from large amounts of data.

What AI is not good at and cannot do

- (1) Responding to creative work and new cases
 - AI is not very good at creative work (designing, research and development) that is not based on past data.
- (2) Understanding the meanings of words
 - Instead of understanding languages and contexts, AI only applies words inferred from patterns.
- (3) Responding to individual cases with little data
 - When there is little data, it is difficult to provide (customize) services for a specific individual.

Know about AI limitations

- (1) AI is not good at everything.
 - It can only do work within the programmed scope.
- (2) AI analysis is not perfect.
 - AI does not consider elements that are not in the input data.
 - Accuracy is also affected by the amount and quality of data learned.
- (3) If the collected data is sufficient, the accuracy of the analysis results will improve. Conversely, if it is insufficient, the accuracy can suffer.



[Other Precautions]

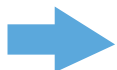
- AI analysis results will vary depending on the purpose.
- For example, AI that offers services that are best for consumers, and AI that offers services that businesses want to sell among services consumers are likely to use, have different results.

AI Categories and Checkpoints for Using it Wisely

For four categories of AI-based services, checkpoints are identified for using them wisely.
When using services of each category, it's a good idea to take a look at these points.

The content shown with the ☑ is the checkpoint

Category	Checkpoints	Category	Checkpoints
<p>(1) AI that recognizes and communicates with audio</p> <p>Example: Smart Speaker Interactive App</p>	<p>AI can misrecognize speech, give incorrect instructions, and collect information about normal conversations.</p> <p>☑ Be careful of the risk of device malfunctions and privacy. Set the range of turning the power on or off and of connected services (for example, home appliances or Internet services).</p>	<p>(3) AI that provides recommendations and advice</p> <p>Example: Diet Assistance Physical Training Assistance Job-changing Assistance Matching & Wedding Assistance Fashion Coordination Advice Investment Advice</p>	<p>The proposals using AI are based solely on the results of analyses within the scope of AI learned data and are not necessarily the best suggestions for the user.</p> <p>☑ Carefully determine for yourself whether you can accept AI advice and expected outcome.</p>
<p>(2) AI that automatically operates device</p> <p>Example: Smart Appliance Communication Robot</p>	<p>It may operate differently from user intention.</p> <p>☑ For safe use, thoroughly review the instructions and how to use described in the instruction manual.</p> <p>☑ Be especially careful when operating appliances during absence.</p>	<p>(4) AI performing examinations</p> <p>Example: Recruitment Screening Loan Examinations</p>	<p>Examination results may reflect biases in the data used for AI learning.</p> <p>☑ Check examination points and policy to tackle the bias possibility (people intervention to prevent bias) by the business operator.</p> <p>☑ If you have any concerns, consider using other services.</p>

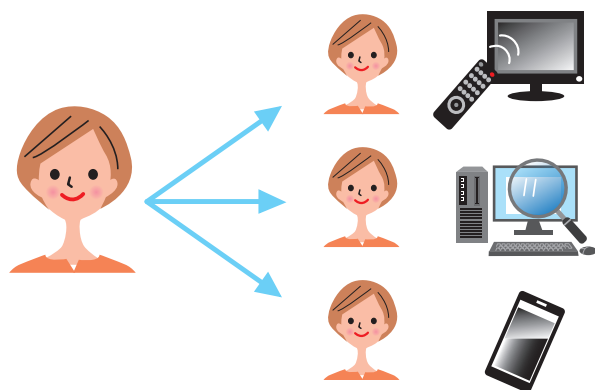


AI can become smarter if lot of good data are provided. Adjust the data you provide while keeping an eye on its output.

Case (1): Smart Speakers

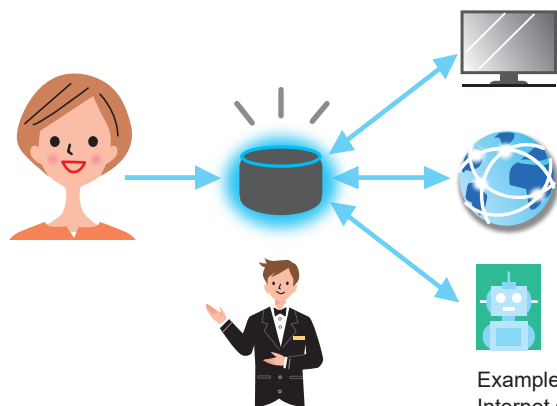
Smart speakers are a product and service that turn on home appliances, give you information you need, and become someone to talk to. You don't need to operate your TV, PC, or call your friends by yourself.

Until now



Until now, each device had to be operated by yourself when operating a home appliance, searching for information, and having a conversation.

By using a smart speaker ...

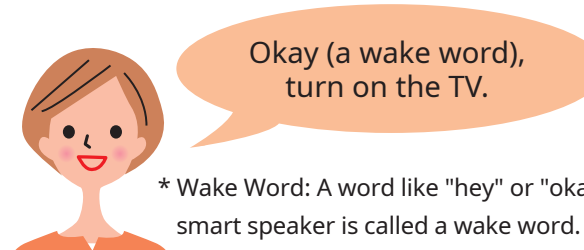


A smart speaker automatically processes your instruction by simply talking to it.

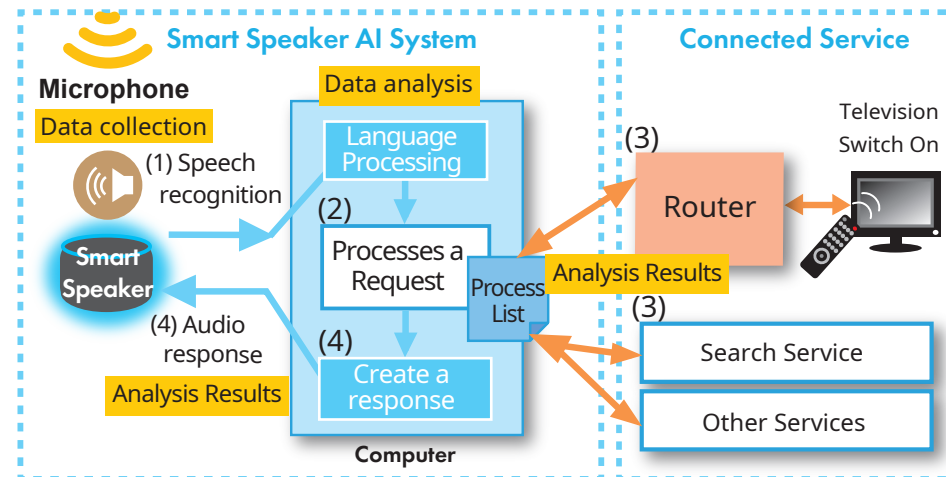
* Limited to preset instructions within the range of the device.

Example: For a smart speaker that connects to an Internet search service, ask today's weather, and a smart speaker provides the weather forecast.

Smart Speaker System



* Wake Word: A word like "hey" or "okay" that signals to start the smart speaker is called a wake word.



- (1) Following the wake word, the voice that spoke to the smart speaker is recognized via the smart speaker microphone.
- (2) The recognized voice (request content) is matched with the processing list on the computer in the smart speaker.
- (3) As a result of the matching, the smart speaker provides instructions for operating the household appliances through a router*, or obtains the necessary information through external service connection.

* A router is a device that connects home appliances and smart speakers.

- (4) AI creates the response content, and a voice response is provided from the smart speaker.

Case (1): Checkpoints for Using Smart Speakers Wisely

- AI operation is limited to the range pre-set by users. Furthermore, there are restrictions to speech recognition environment and the speaker's intonation.
- Be careful of the risk of device malfunction and privacy. When it is not in use, turn off the power and set the range of connected services.



(1) What happens when there is no reaction when I talk to it?

Smart speakers recognize audio communicated via the microphone, so it may not be able to hear your voice if there is background noise. Furthermore, if the intonation is different from learned data, the system may not be able to recognize the voice.

- ☑ When speaking to a smart speaker, be careful not to make noise. Also, speak clearly toward the microphone.



(2) It can also react to other people's voices.

There are cases where the voice is mistakenly recognized, or the voice of others may be able to give instructions other than the wake word.

- ☑ Learn about the audio recognition function of the product.
- ☑ If you have any concerns, turn off the power when you have a visitor or when you are absent.



(3) What happens when it does not respond to my instructions?

AI operates within a pre-programmed range of its functions. The household appliances may not be connected to the smart speaker or the appliances are not in operation even when the function is available.

- ☑ Learn about the audio operable function of the product.*
 - ☑ If the function is available, check the operation of the connected device.
 - ☑ Some services are not available without an Internet connection.
- Check whether the device is connected to the Internet.

* When the program version is updated, the range of applicable function may be expanded. Check the manufacturer's website for the latest software.



(4) Information that is different from the instruction was offered.

Smart speakers behave in the same way as Internet search engines.

- ☑ Understand that the information offered may be incorrect and that fake sites may be offered to you.



(5) I bought things on a shopping website without giving an instruction to do so.

There is always a possibility of purchasing items due to speech misrecognition.

- ☑ Take precautions to prevent malfunctions, such as requiring a password when you make a purchase.

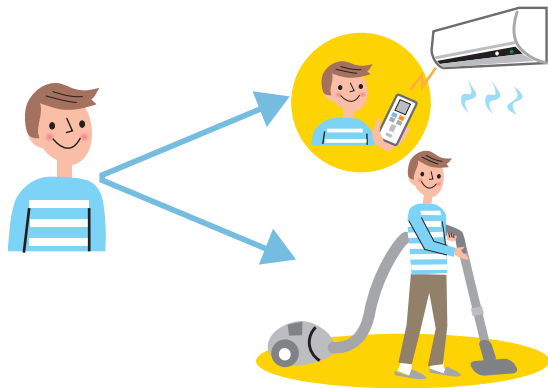
* If you inadvertently purchase something because of misrecognition of your voice by the smart speaker, the agreement may not have been properly concluded, or you may be able to cancel the agreement. (Ministry of Economy, Trade and Industry: Interpretative Guidelines on Electronic Commerce and Information Property Trading)



Case (2): Smart Household Appliances

Smart household appliances are appliances that can be connected to the Internet and operated remotely. Furthermore, smart household appliances equipped with AI can operate automatically and do the cleaning that suits your living environment and lifestyle.

Until now



Until now, users had to control the power supply to household appliances, to set the temperature of air conditioners, and to clean their rooms by themselves.

By using a smart appliance ...



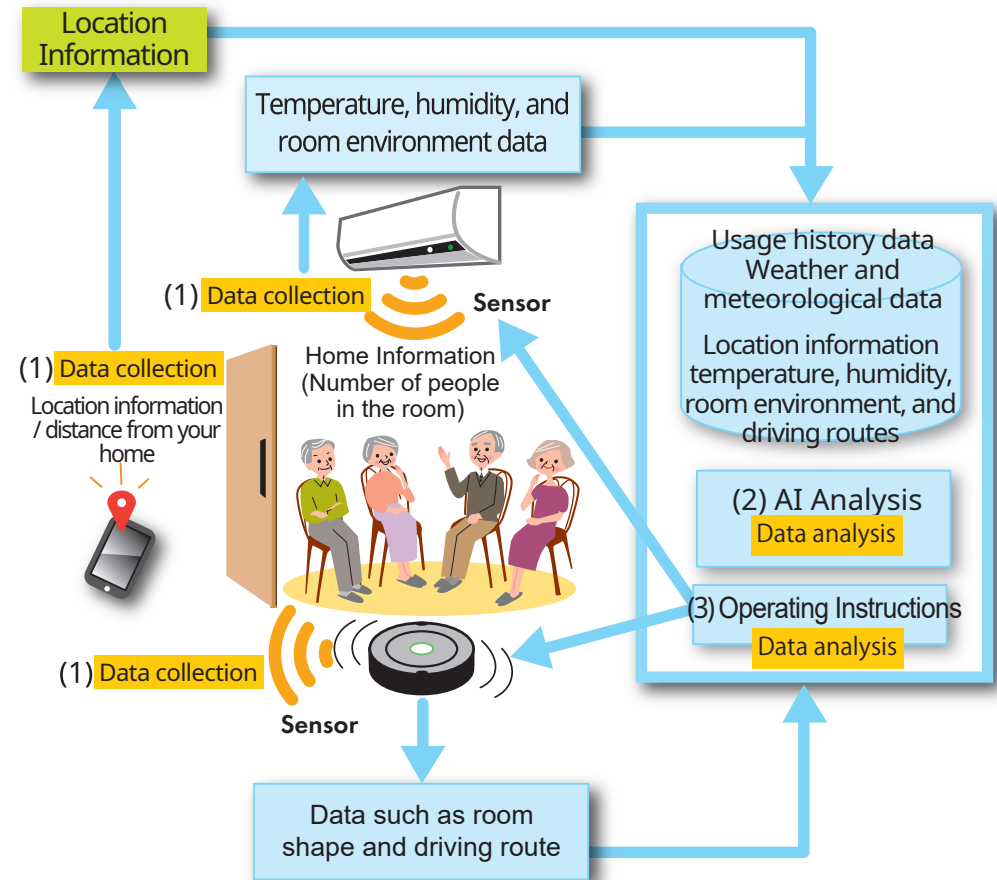
While You Are Out

- Based on information from sensors attached to the household appliance, and use histories, appliances are operated without having you to operate them.

Example:

- Air conditioning: Automatically adjusts the room temperature for a comfortable range depending on the outside temperature.
- Air conditioning: Automatically starts running when you are returning your home.
- Vacuum cleaner: Automatically cleans your house while you are out.

Smart Household Appliance System



- (1) Usage history data, weather and meteorological data, room temperature, humidity and environment, number of people in the room, and information on going out of the house (smartphone location information) are collected.
- (2) Based on the collected information, AI analyzes the user's living environment and lifestyle situation.
- (3) AI operates household appliances based on the analysis results.

Case (2): Checkpoints for Using Smart Household Appliances Wisely

- Smart household appliances operate while you are at home, as well as while you are out of the house, but they may not necessarily operate as you expect.
- Manufacturers often set specifications with safety consideration. Understand the usage instructions and the operation guaranteed by the manufacturer described in the instruction manual, so that you will use it safely.

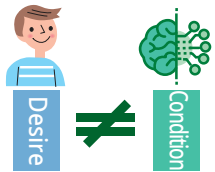


Q1: AI behaves differently than expected.

- ✓ Read the Terms and Conditions and use it correctly.
- ✓ If it does not behave as described in the instruction manual, contact the manufacturer's support center.

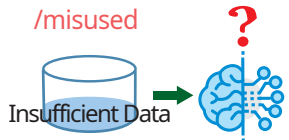
Causes for AI not behaving as expected and how to confirm the cause

(1) If the user desires something different from general conditions assumed in the programming



For example, AI is programmed on the premise that if you use it in this way, you will want to operate it in this way. For that reason, the conditions of your desired behavior and the programmed behavior may differ.

(2) When the data accumulation after the product is shipped is insufficient /misused



For smart household appliances that continue to learn about users particular usage after shipment, performance can be higher or lower, depending on the data that is learned.

(3) When the accuracy of AI is not 100%

Even if the usage is appropriate and the AI is functioning correctly, the accuracy of AI is not 100%, so it may operate differently than expected sometimes.

(4) When it is caused by equipment/AI malfunction



Q2: A self-driving vacuum cleaner has destroyed my household belongings.

- ✓ Read and understand the instruction manual before use, such as what to clean up, what to remove from the floor, and areas where it cannot get through.



Q3: When I was out, I wanted to turn on the AI air conditioner for my pets, but it had stopped.

- ✓ Check the requirements for the smart household sensors to respond, and functions that will prevent long hours operation.
- ✓ If you want to run it certainly, either operate it manually or, if possible, remotely check and control the operation status.



Q4: It operates when I don't need it and it cost me a lot for the electricity. The temperature setting is warmer (colder) than necessary.

The control function of the AI air conditioner must be examined by the user to run AI air conditioners wisely. If the user examines it incorrectly, the AI air conditioner may operate when the user thinks it is unnecessary.

- ✓ Examine the AI air conditioner operation correctly so that the AI air conditioner will operate as you expect.

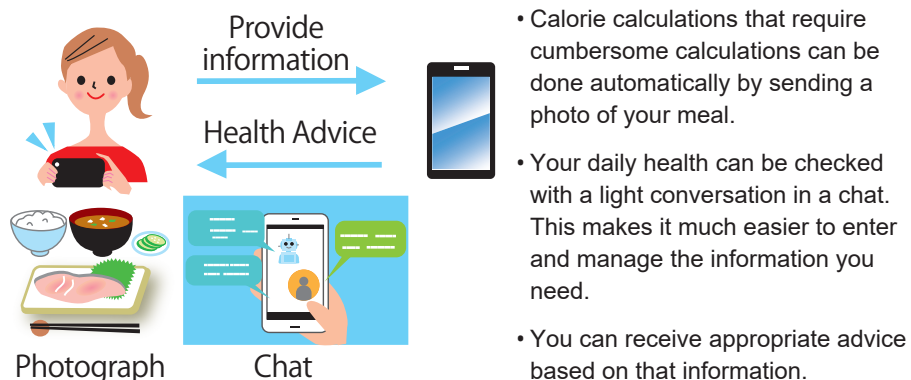
Case (3): Health Counseling Services

When you use an AI-based health support app, the service enables you to understand your health status by simply entering your photo and simple information, and gives you advice on what you need to do (regarding meals and exercises) to achieve your health status and diet goals.

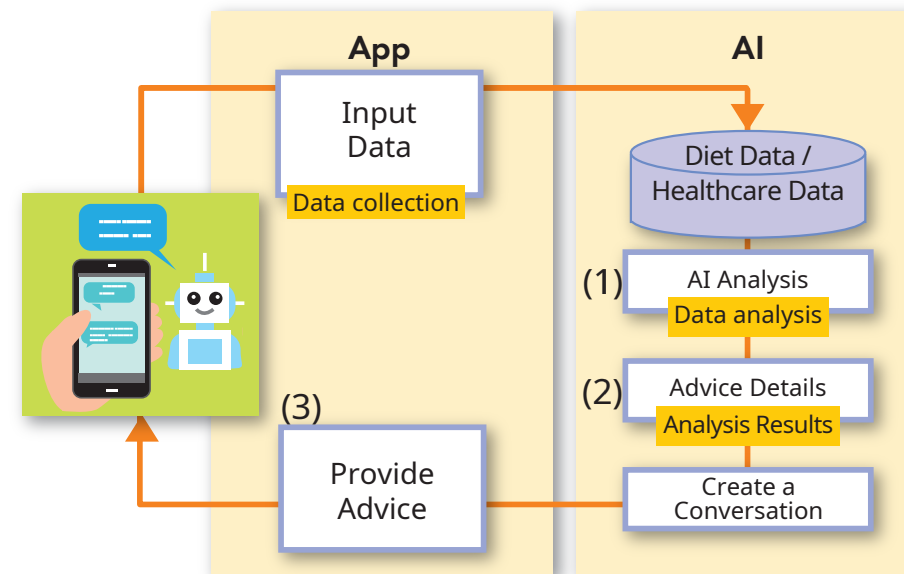
Until now



Using Health Counseling Services ...



How Health Counseling Services Work



- (1) AI analyzes the information entered in the app, diet data and healthcare information collected in large quantities.
- (2) As a result of the analysis, it selects the best advice for that person.
- (3) Converts the advice selected in (2) into conversation content, and offers the advice on the app by conversation.

Case (3): Checkpoints for Using Counseling Services Wisely

- AI can offer advice with high accuracy, but it is not always 100% accurate.
- Decide for yourself whether to accept AI advice. When you accept and execute the advice, and if you think the advice is not quite right, stop accepting AI advice.



Q1: AI doesn't provide me appropriate advice.

If AI does not give you appropriate advice, there are several possible reasons why.

- (1) If the user desires something different from general conditions assumed in the programming
- (2) When the data accumulation after the product shipment is insufficient/misused
- (3) When the accuracy of AI is not 100%
- (4) When the AI malfunctions

► For details, see Case (2): Checkpoints for Using Smart Household Appliances Wisely Q1

- ☑ Don't over-trust the content of the AI advice, and use it with your judgement.*
- ☑ If you understand that the advice offered by AI is not perfect and you need to revise the advice that is offered, contact the shop where you purchased it or the support center.
- ☑ Talk to your doctor if you have any health problems.

* It is said that people tend to prefer the results displayed automatically to the results offered by other people (automation bias). Make your judgment in a calm manner with that in mind.



Q2: I talk too much with the AI character giving the advice (I will be charged for that).

- ☑ Even if the character appears to be having a conversation with you, it is due to AI-generated "conversation patterns". Be careful not to rely on that too excessively.*

* Depending on the app, the conversation generated by the registered dietitian may be sent using a character.



Q3: I am uneasy about being asked about personal information in an inductive conversation.

- ☑ When using the app, check the terms and conditions regarding the use of personal information and other data.
- ☑ If you are unsure, take action such as "will not provide information" or "log out when you have finished."



Q4: I may be led to ads during conversations.

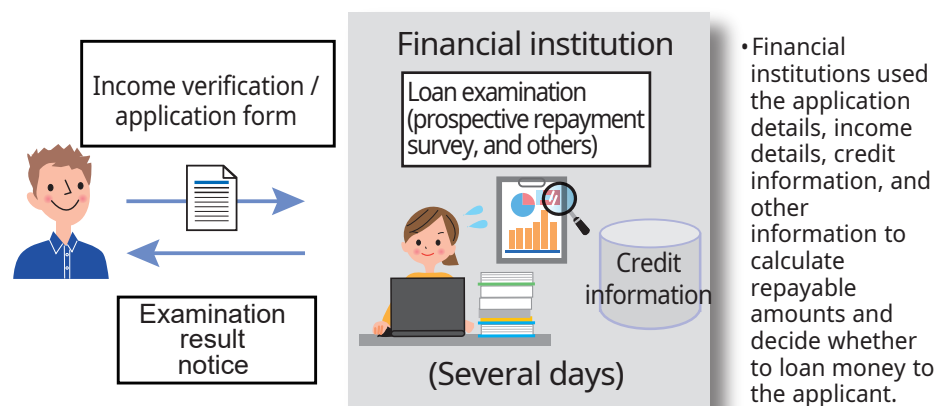
In order to offer an app for free, some apps may display ads or direct you to them.

- ☑ Understand that ads may be displayed and be careful not to be led to them if they are unnecessary.

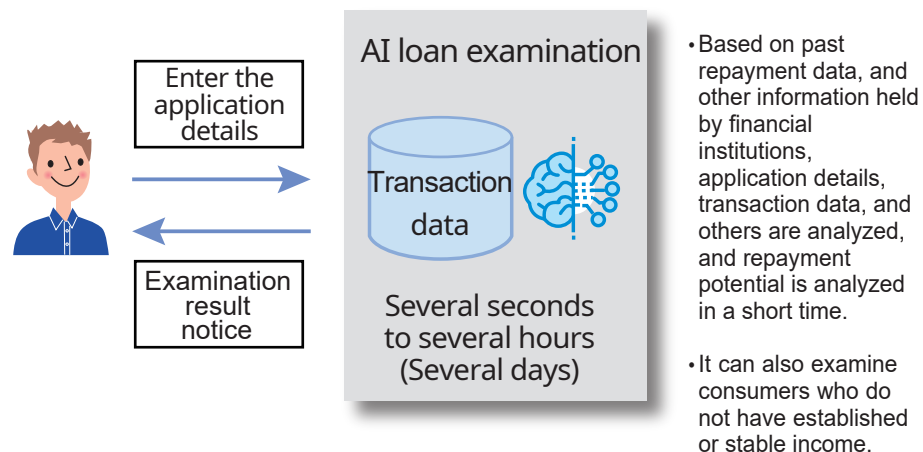
Case (4): AI Loan Examination Service

In general loan examinations, personal credit information, the ratio of borrowings to income, and surveys of repayment prospects are all considered. However, in recent years, we have seen services that make loan decisions by analyzing transaction data and other information using AI.

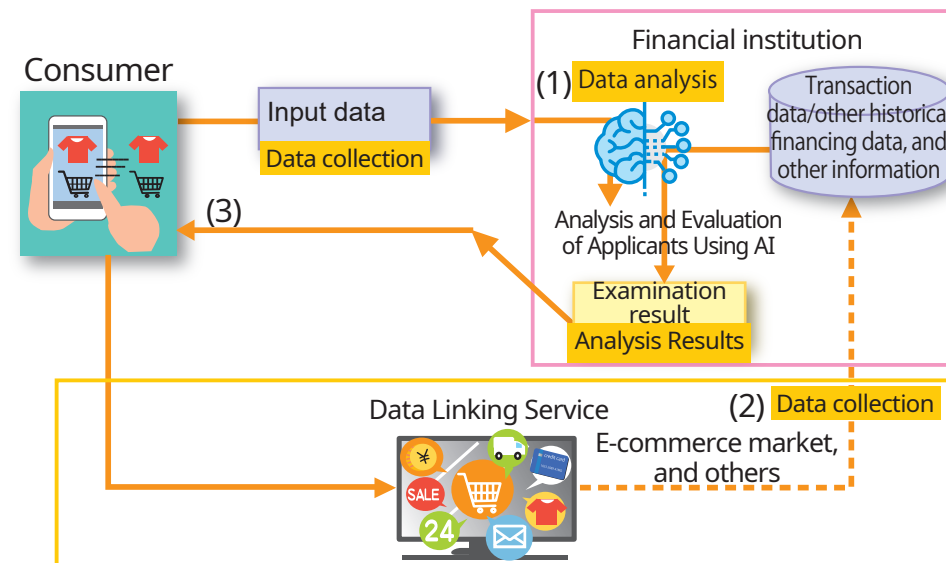
Until now



Using the AI Loan Examination Service ...



AI Loan Examination Service System



- (1) When a consumer enters the information necessary for applying to borrow through Internet, the financial institution analyzes and evaluates the applicant's repayment capacity in light of historical borrowing performance data accumulated at the institution.
- (2) Some financial institutions may utilize data from external affiliated companies or information of other services provided by that company or group companies, and the data that is utilized can vary depending on the financial institution.
- (3) Based on the results of data analysis, once the review results are produced, the results are sent to the consumer.

Case (4): Precautions for Using AI Loan Review Services

- Loan examinations implemented by AI can be done in a different way than previous loans, in some cases it may lead you over-indebted. Use them with consideration of the amount you can pay by yourself.
- Examination results may also reflect biases in the data used for AI learning, and AI makes loan judgments regardless of the person's payments capacity. Check the company's loan examination items, considerations and policies relating to data utilization.
- If there is a problem or you are unsure, consider using another service.



Q1: I have not been able to borrow before, but after having an AI loan examination, I was able to borrow money. Why is that?

In conventional loan examinations, the method of calculating repayment potential based on income information is very common. However, in loan examinations implemented using AI, it analyzes and examines alternative data, so it is possible for you to borrow even if it has been difficult for you to borrow until now.*

☑ Use it only after you adequately considering whether you can make payments by yourself.

* In addition to credit that may not be applicable under the Money Lending Business Act and the Installment Sales Act, the revised Installment Sales Act of 2020 allows advanced credit reviews based on big data, if approved in advance, using methods that do not follow the conventional formulas.



Q2: I don't know whether I can improve anything by myself because it won't give me the reason for the review results.

Though detailed information about the examination is often not disclosed, some businesses do explain to what items they refer when they implement the review.

☑ Check the basic philosophy behind examinations implemented by financial institutions.



Column

Request for cooperation to prevent problems to deferred payment operators by the National Consumer Affairs Center of Japan

In recent years, there has been a diversification of payment methods thanks to the utilization of AI, and deferred-payment settlement services are just one of such services (AI may be used to examine the use of services).

Deferred-payment settlements are increasingly being used as a convenient service, such as for mail-order sales, where payment can be made after the arrival of purchased goods. Conversely, however, even for low-priced goods, problems will arise, such as the inability to pay because several goods were purchased from multiple businesses using deferred-payment settlement.

In response to this situation, the National Consumer Affairs Center of Japan made a request for improvements to deferred-payment settlement services providers in order to prevent consumer problems. When you use a new service, always be careful of the service and the content of the transaction by yourself.

Where to Contact for Help

- If you have any problem with a product or a service with AI, please contact the business operator (manufacturer or service provider).
- If you still can't solve the problems, don't worry about it all by yourself. You can consult with the consumer hotline. Call 188.



Business Operator
(Manufacturer or Service Provider)



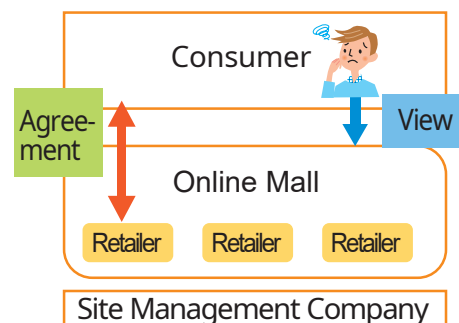
* Consumer Hotline 188 is a nationally-accessible telephone system which provides information about consumer affairs consultation offices near you established by local governments.

Compensation for AI-related products and services

- If you experience a problem with a product or service with AI, check the details described in the product or service manual, such as the operation warranty, and confirm the contact information and the compensation that may be available.
- * If AI is installed on a robot, you may be eligible to receive some form of legal compensation for the defect. Furthermore, even if AI is a merely a program, the manufacturer may offer some form of compensation.

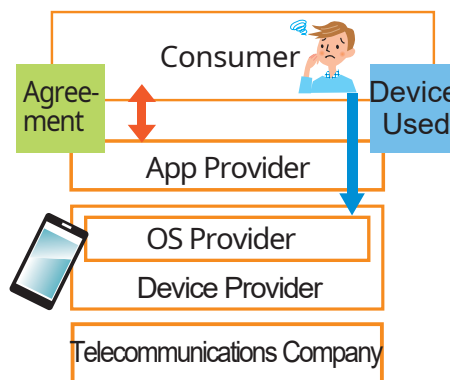
- If you purchased goods or services over the Internet, note that the operator and seller at the online mall may differ.
- However, if you cannot solve your problems by contacting the seller or app provider, contact your intermediary (the online mall operator, smartphone OS provider).

For Online Malls



√ Business operators that provide a place (a marketplace) where multiple different retailers can gather and sell, such as online malls, are not necessarily the seller of the goods.

For Smartphone Apps



√ A large number of vendors involved in providing services, such as companies that provide smartphone devices, smartphone operating systems (OS), apps on those OS'es, and telecommunications companies. Talk to your app provider when you have a problem with your app.

Data Management for Using AI Wisely

- In AI-based services, there are problems with data privacy by service providers.
- It is possible to manage personal data such as setting your own privacy by yourself, but in order to enjoy the benefits of AI, it is necessary for AI to analyze adequate and good-quality data.
- Therefore, rather than making all of your data as non-disclosed, take measures such as making your data non-disclosed when necessary while also checking business operators personal data management policy.

Check the following points after reading the Terms and Conditions, and Privacy Policy.

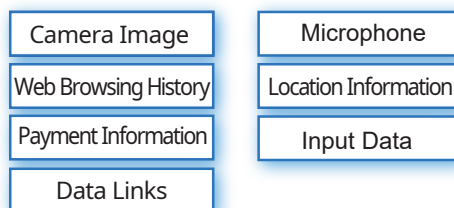
Learn more about the personal data usage and the scope

- ☑ When using the service, learn how and with whom your data may be shared.

⇒ With regard to personal data acquisition, the business operator collecting the personal data is required to obtain your consent in advance regarding the purposes for collecting your data, and the scope of its use.

- ☑ Find out from where and what kind of information is being collected.

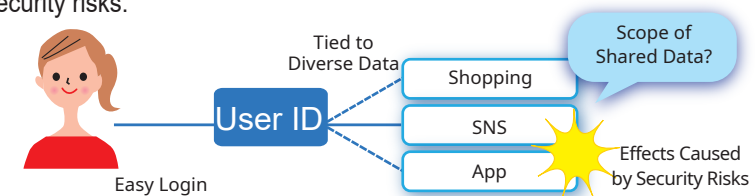
⇒ Particularly, there is always the possibility that a wide of variety your data such as voice data, location information, room temperature information, and other data are being disclosed without your being aware, and not just the data that you personally entered online.



- ☑ If necessary, take measures such as by switching the power on/off.

- ☑ When you use multiple services with the same user ID, you should devise different accounts depending on services, or delete your data regularly.

⇒ In the case of an ID link, there is a benefit of not having to enter the same information over and over many times, and there is some advantage such as accumulating points. Conversely, you should exercise caution because that can result in providing too much information and being more widely exposed to other security risks.



Confirm what to do if there are any changes.

- ☑ Learn what notifications you'll receive if there are changes to the purpose of your data usage, and the method of data usage.

Confirm whether you can choose your own data settings and if the business operators can be trusted.

- ☑ Check if you can set your own privacy settings.

⇒ Depending on the service, you may be able to make our own privacy settings and to set the scope of the data usage. Set them as necessary.

- ☑ If you are not satisfied with the privacy policy of the business operator, the status of their data management, stop using that service and consider using a different one.

Data Management for Using AI Wisely



Q1: I don't want my data to be collected all the way up to my search history on the Internet beyond the service I used.

While logged on to the service, sometimes your browsing history of other Internet sites may also be controlled in association with your login ID.

- ☑ If you are unsure, take measures such as logging off from the service.
- ☑ Conversely, it is important to note that the quality and quantity of information provided will also affect AI analysis results.



Q2: My information has been leaked.

Many services are connected to the Internet and therefore are exposed to security risks.

- ☑ Learn more about the vendor's security measures and what you can do if there are any issues.
- ☑ In addition to periodically updating the software, it is also possible to adjust the data you provide by taking measures such as turning off the power and logging off when you are not using a service.



Q3: I don't want my data to be analyzed.

Some companies allow consumers to set their own privacy settings for their services.

- ☑ Find out if you can choose "not to have your browsing history analyzed and display contents customized" with regard to information to be displayed.
- ☑ If you can make setting choices, make the settings as necessary.

Know a Trusted Vendor

- It is possible to strictly control your privacy and to refuse to provide data, but that makes it difficult for you to enjoy the benefits of AI.
- Therefore, you should check whether the service provider is trustworthy, and provide data to the trustworthy provider while using the service.

- ☑ Confirm the vendor's response to the Checkpoint by Services and Data Management for Using AI Wisely.
- ☑ Compare the vendor's response with the benefit of its service to determine whether you should provide personal data to the vendor and use its service.
- ☑ In addition, you can check whether the vendor has formulated a policy relating to the utilization of AI and its content and refer to that to determine whether they are trustworthy.*

* In 2019, the Cabinet Office Integrated Innovation Strategy Promotion Council established "Social Principles of Human-Centric AI." The expectation was expressed that AI development utilization principles would be established among AI developers and business operators. Furthermore, "AI Utilization Guidelines" by the Conference toward AI Network Society, the Ministry of Internal Affairs and Communications, published in July, 2019, describes the principles to be observed when utilizing AI and the measures to be taken in its implementation.

Summary

Recent developments in digitalization have led to advancements in AI utilization in many areas.

While AI brings greater benefits to our lives, some people may feel a vague sense of anxiety that they've heard about AI, but are still unsure about using AI, and still somewhat afraid of AI.

This handbook has been created as a first step for all consumers to be able to use AI safely and with a sense of security.

We hope that by your reading this handbook, acquiring the basics of AI, and learning the points to use AI wisely, AI will in fact make your life affluent and bring greater comfort to you.



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