Chapter 5
Description Requirements

In order to file a patent application, you need to describe the details of your invention in patent documents such as claims and description.
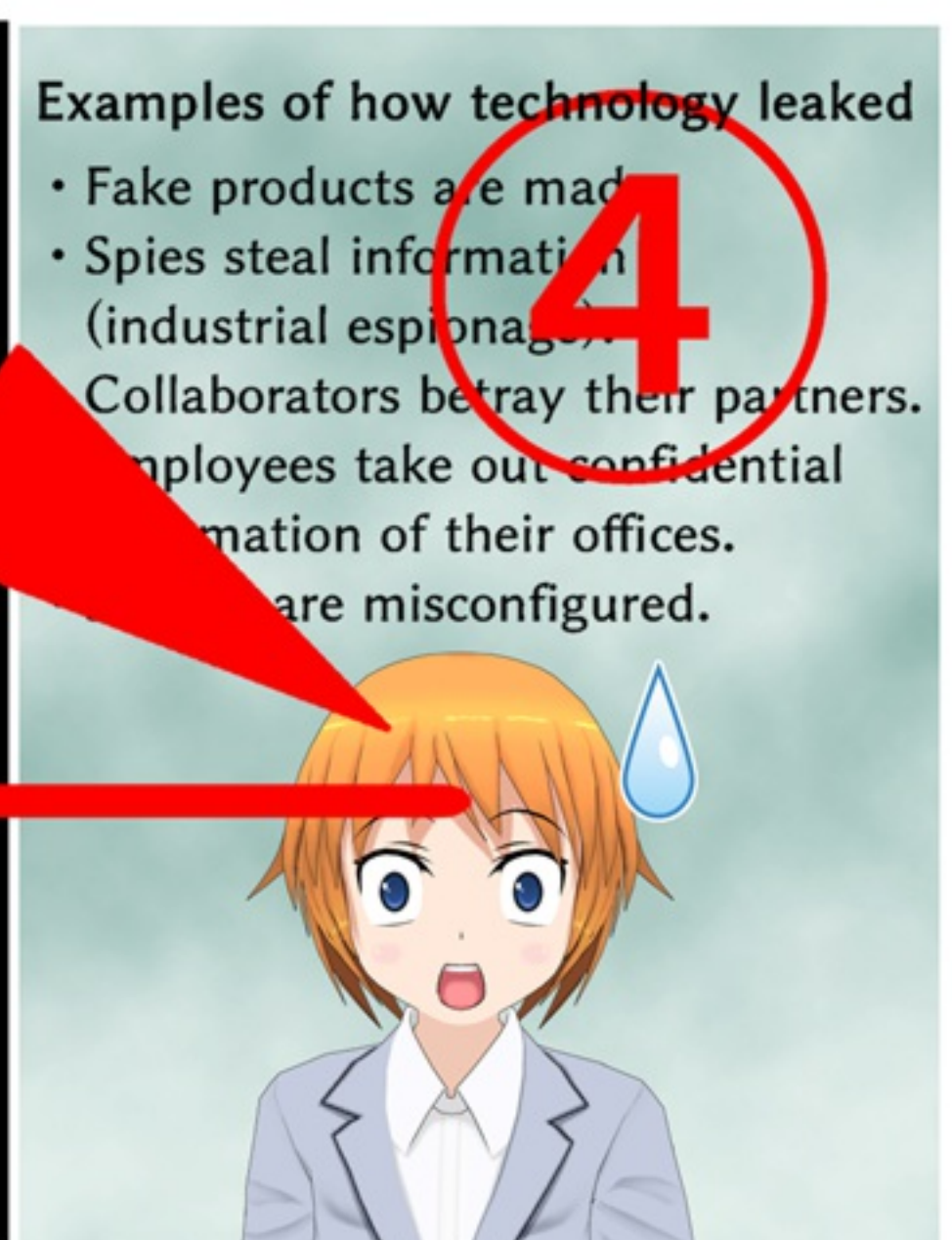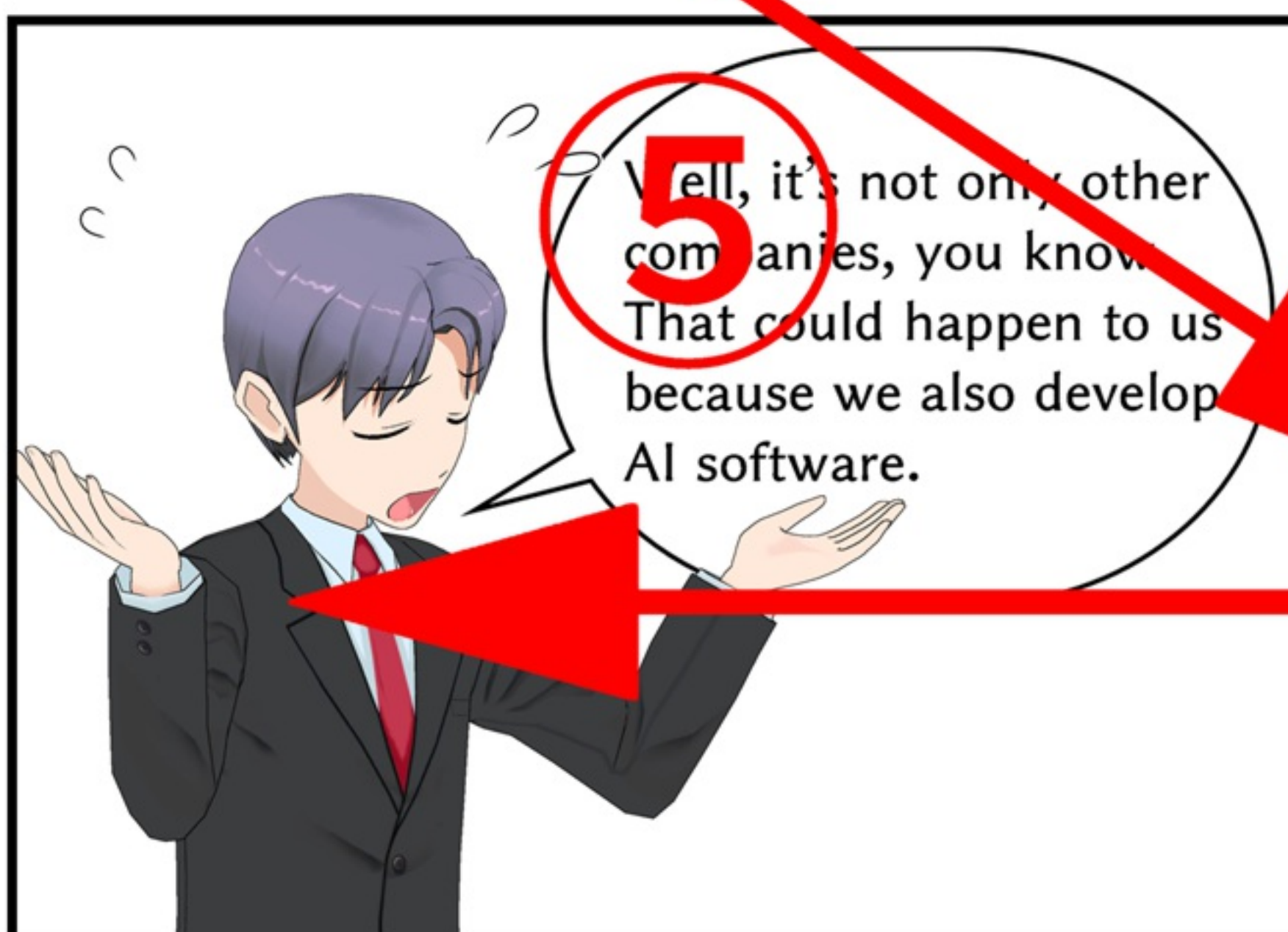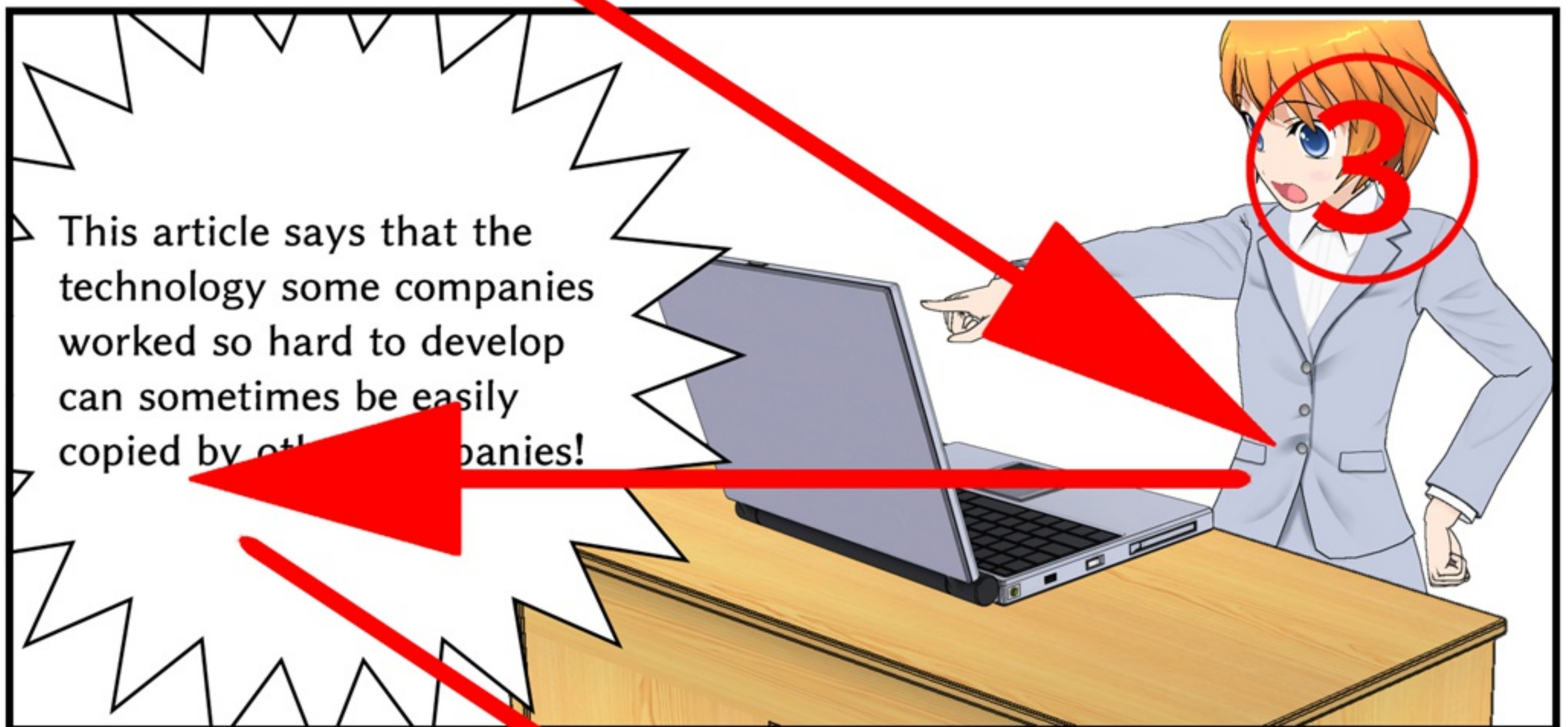For AI-related inventions, pay attention to the correlation among training data and describe it in the patent documents.
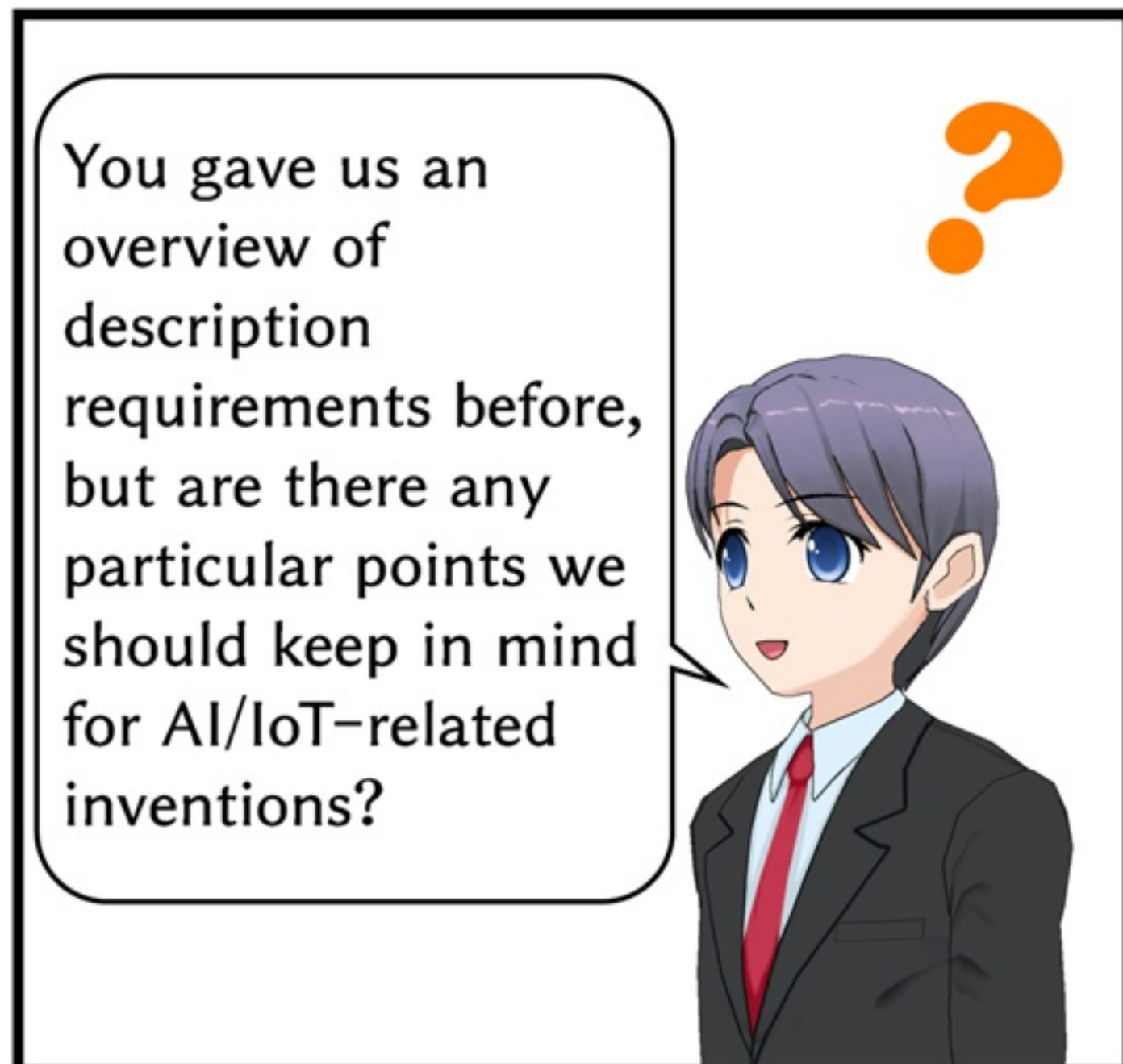
If you find it difficult, focus on the speech bubbles, because it's more important to understand the overall flow than the details.

* The speech bubbles are designed with beginners in mind, emphasizing ease of understanding over accuracy.
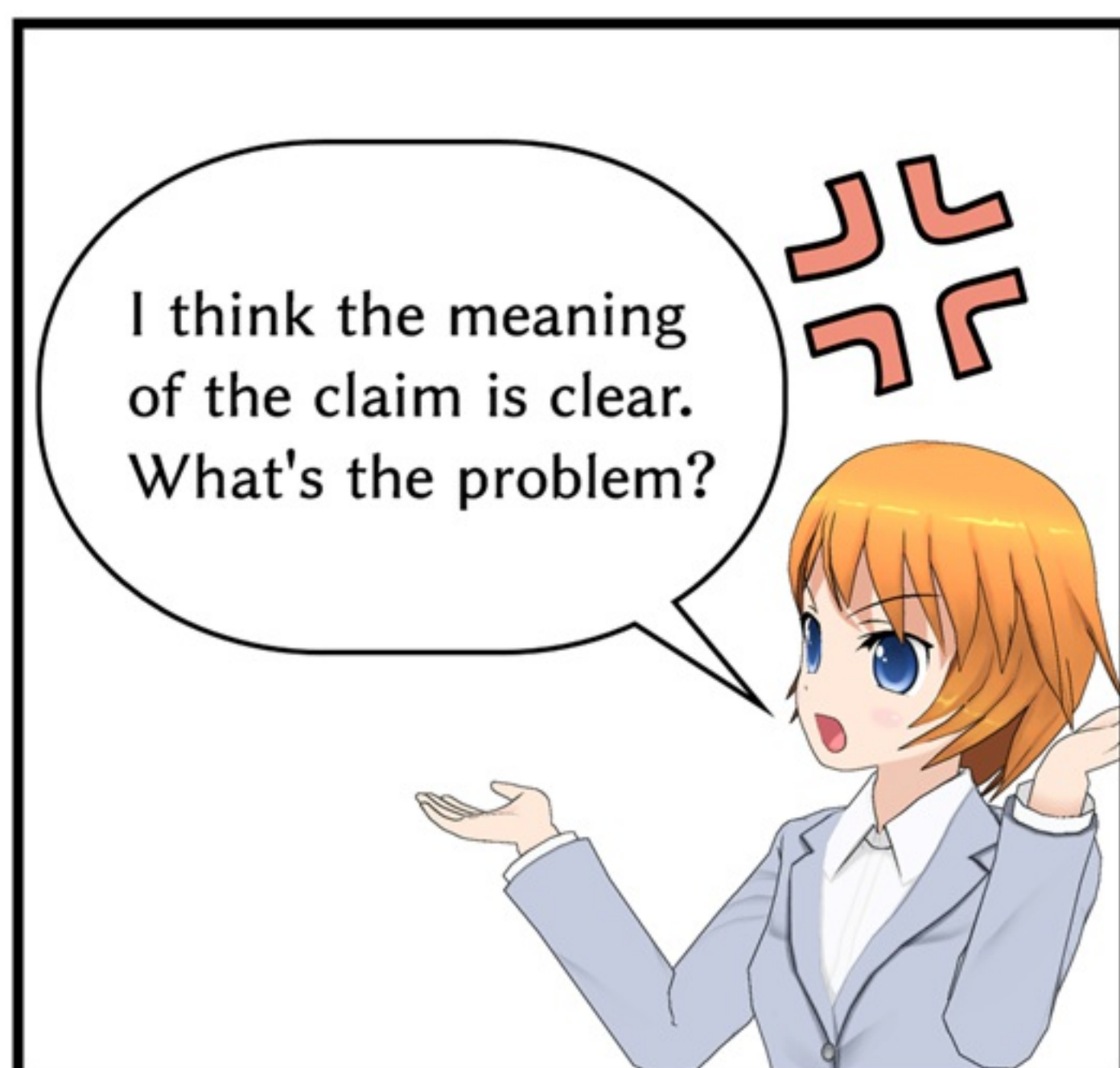
How to read this Manga

(1) Hey, look at this, Ota!

(2) What seems to be the problem? Please calm down a little bit as the president...

(3) This article says that the technology some companies worked so hard to develop can sometimes be easily copied by other companies!

(4) Examples of how technology leaked
- Fake products are made.
- Spies steal information (industrial espionage).
- Collaborators betray their partners.
- Employees take out confidential information of their offices.
- ...are misconfigured.

(5) Well, it's not only other companies, you know. That could happen to us because we also develop AI software.

Since AI/IoT-related inventions are a kind of software-related inventions, let's start with the points to keep in mind about software-related inventions in general. First, take a look at the following claim.

You gave us an overview of description requirements before, but are there any particular points we should keep in mind for AI/IoT-related inventions?
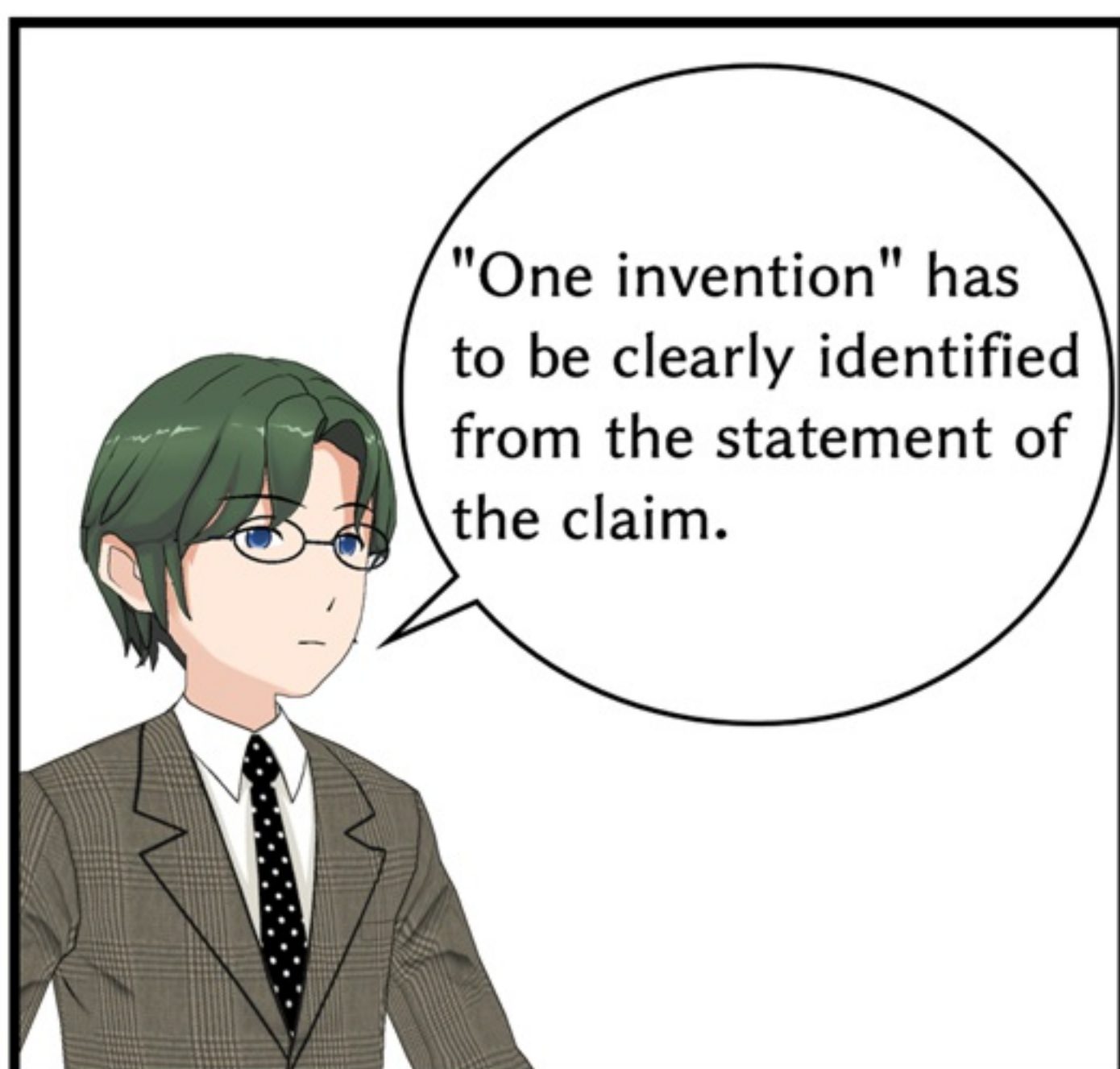
[Claim 1] (Examination Handbook Annex B, Chapter 1, 1.2.1.3, (1) Example 1)
An order receiving method using a computer, which performs a step of receiving an order of an article from a customer; a step of checking for stock of the ordered article; and a step of responding to the customer if there is stock of the article that the article can be dispatched and responding to the customer if there is no stock of the article that the article cannot be dispatched.
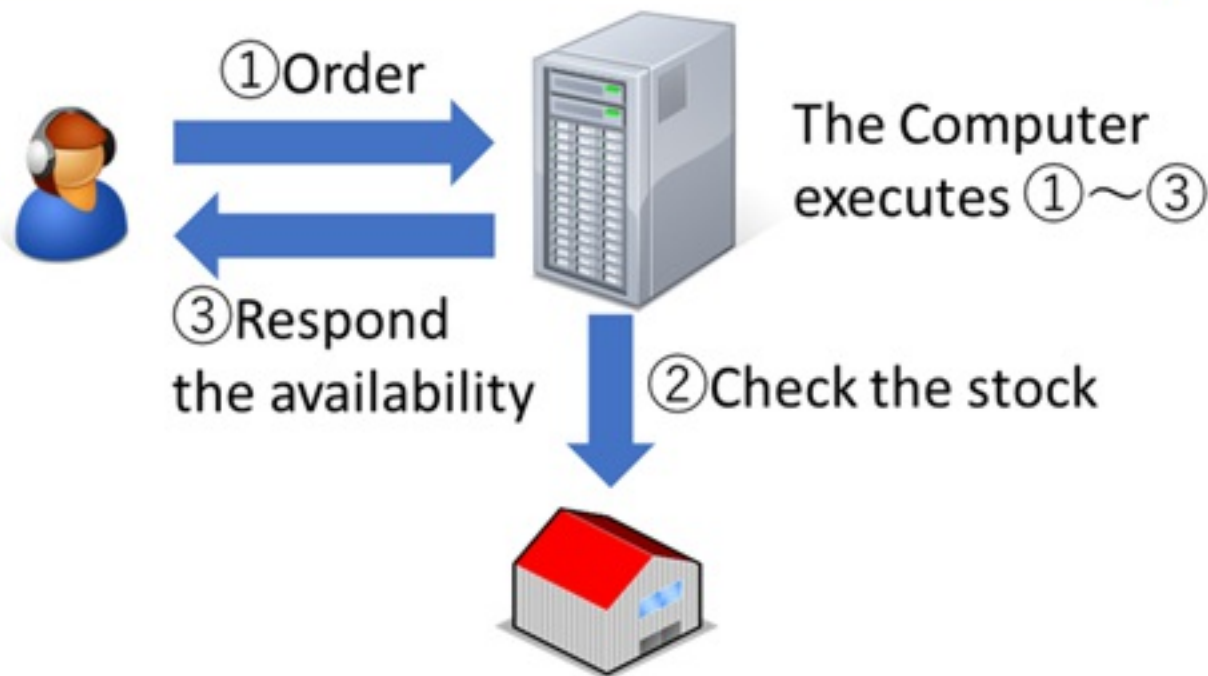
The phrase "using a computer" can be interpreted in two ways.
Let's think about those two interpretations.

"One invention" has to be clearly identified from the statement of the claim.

I think the meaning of the claim is clear. What's the problem?

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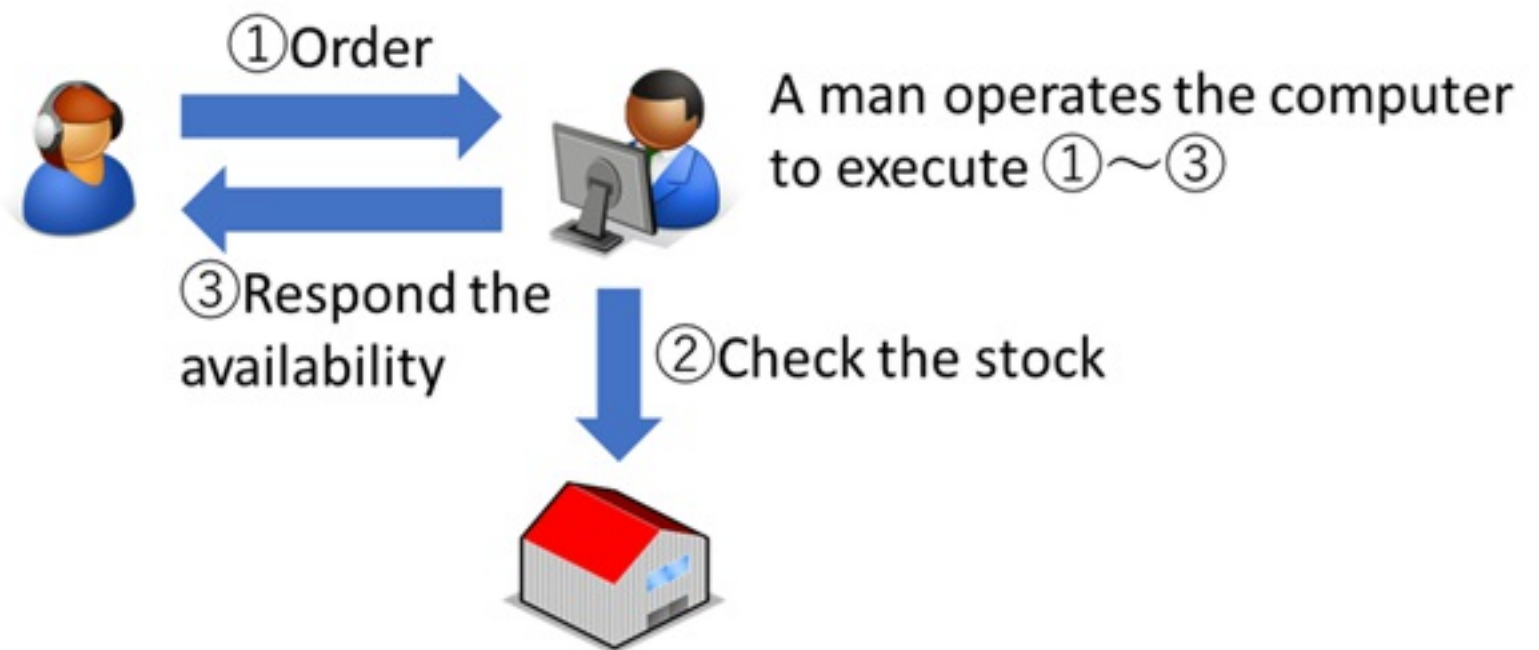# Example in which one invention cannot be clearly identified from the statement of the claim

[Claim 1] (Examination Handbook Annex B, Chapter 1, 1.2.1.3, (1) Example 1)

An order receiving method using a computer, which performs a step of receiving an order of an article from a customer; a step of checking for stock of the ordered article; and a step of responding to the customer if there is stock of the article that the article can be dispatched and responding to the customer if there is no stock of the article that the article cannot be dispatched.

Information processing method with a software

① Order
③ Respond the availability
② Check the stock
The Computer executes ①〜③

Method of operating a calculation tool of a computer

① Order
③ Respond the availability
② Check the stock
A man operates the computer to execute ①〜③

Since claim 1 can be interpreted in two ways, "one invention" cannot be clearly identified.
→ Claim 1 is not clear.

I see, the subject of the steps 1–3 can be interpreted as a computer or as a human.

What's important is not whether the subject of the process is described at each step, but whether "one invention" can be clearly identified.

Does this mean that if we don't describe the subject of each process, it will violate clarity requirement?

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In other words, the program itself doesn't function as a certain means. Let's take a look at the following example.
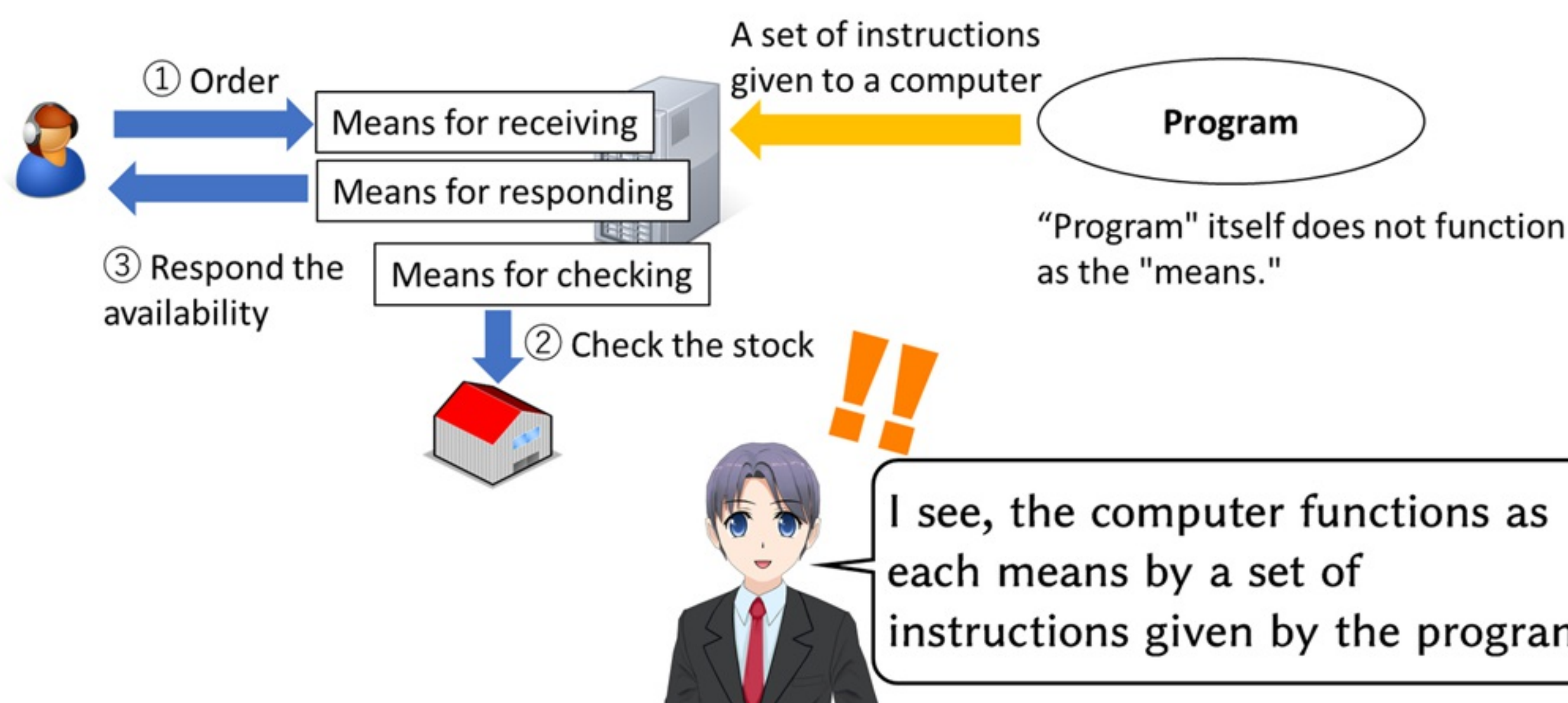
Pay attention to the fact that program is "something that makes the computer function as a certain means".

Example of claim as if "program" itself is provided with functional means

[**Claim 1**] (Examination Handbook Annex B, Chapter 1, 1.2.1.3, (1) Example 2)
A program comprising order receiving means for receiving an order of an article from a customer; examination means for checking for stock of the ordered article; customer response means to respond to the customer if there is stock of the article that the article can be dispatched and respond to the customer if there is no stock of the article that the article cannot be dispatched.

A set of instructions given to a computer

① Order

Means for receiving

Means for responding

③ Respond the availability

Means for checking

② Check the stock

Program

"Program" itself does not function as the "means."

I see, the computer functions as each means by a set of instructions given by the program.

Example of amendment to meet clarity requirement

[Claim 1 (amended)]
A program for causing a computer to function as means for receiving an order of an article from a customer; examination means for checking for stock of the ordered article; customer response means to respond to the customer if there is stock of the article that the article can be dispatched and respond to the customer if there is no stock of the article that the article cannot be dispatched

There are certain patterns for drafting the claims that you might want to refer to.

Do I have to worry about every single detail like that? That's a lot of work!

Examples of how to describe program claims

(Examination Handbook Annex B, Chapter 1, 1.2.1.1)

(i) Program

> Example 1: A program for causing a computer to execute a step A, a step B, a step C, ... Example 2: A program for causing a computer to function as means A, means B, means C, ... Example 3: A program for causing a computer to implement a function A, a function B, a function C, ...

(ii) "Structured data" or a "data structure"

> Example 4: Structured data including a data element A, a data element B, a data element C, ...
> Example 5: A data structure including a data element A, a data element B, a data element C,...

(i) A computer readable recording medium which records (i) or (ii)

> Example 6: A computer readable recording medium which records a program for causing a computer to execute a process A, a process B, a process C, ...
> Example 7: A computer readable recording medium which records a program for causing a computer to function as means A, means B, means C, ...
> Example 8: A computer readable recording medium which records a program for causing a computer to implement a function A, a function B, a function C, ...
> Example 9: A computer readable recording medium which records structured data including a data element A, a data element B, a data element C, ...

Now it's time to take a look at the key points of description requirements for AI-related inventions.

Okay, I got it, I think I can handle it!
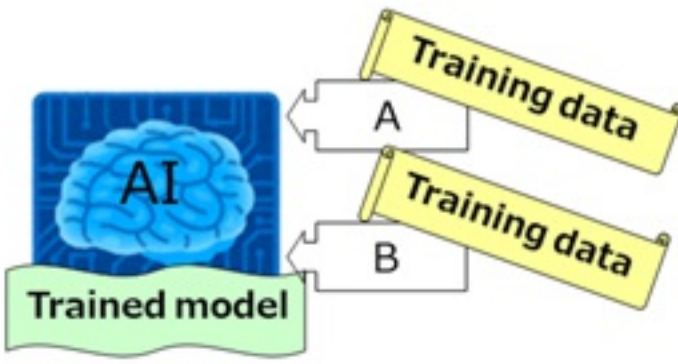
Sugar content estimation system

[Claim 1] (Examination Handbook Annex A, 1. Description Requirements, Case 46)
A sugar content estimation system comprising:
  a storage means for storing face images of people and sugar contents of vegetables produced by the people;
  a model generation means for generating a determination model through machine learning, to which a face image of a person is input and from which a sugar content of a vegetable produced by the person is output, using training data containing the face images of the people stored in the storage means and the sugar contents of the vegetables,
  a reception means for receiving an input of an face image; and
  a processing means for outputting, using the generated determination model that has been generated by the model generation means, a sugar content of a vegetable produced by a person that is estimated based on the face image of the person inputted to the reception means.
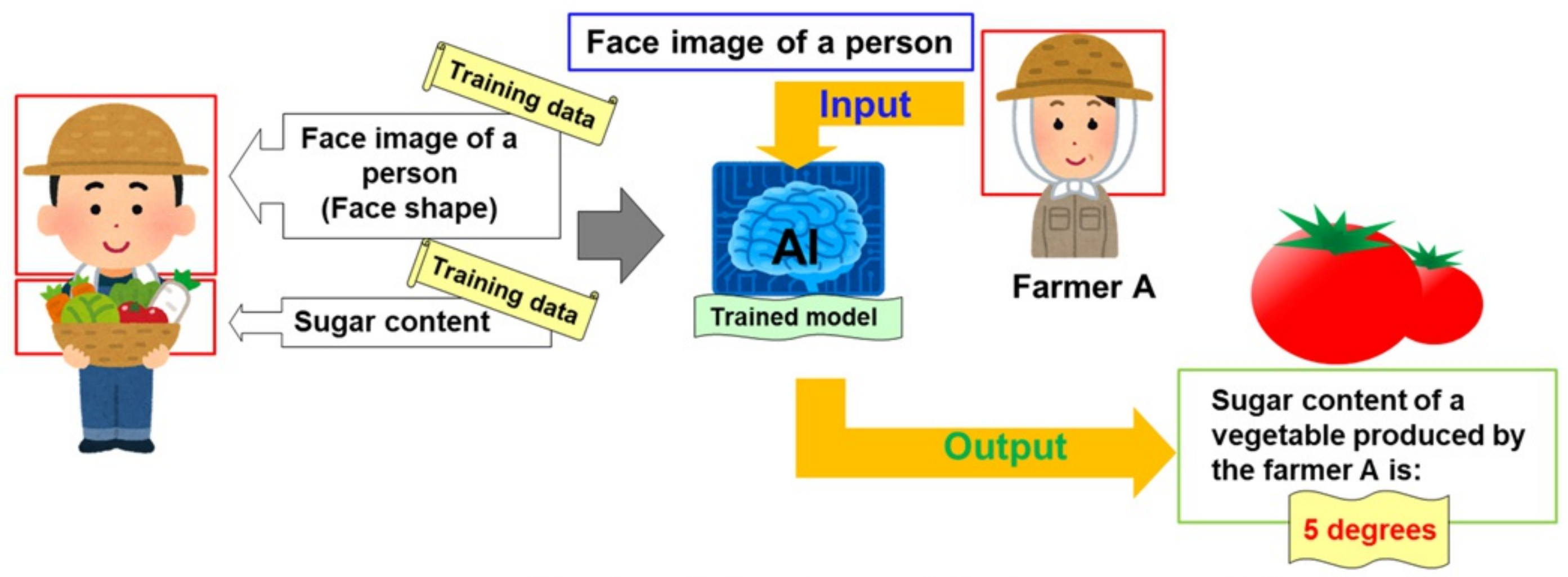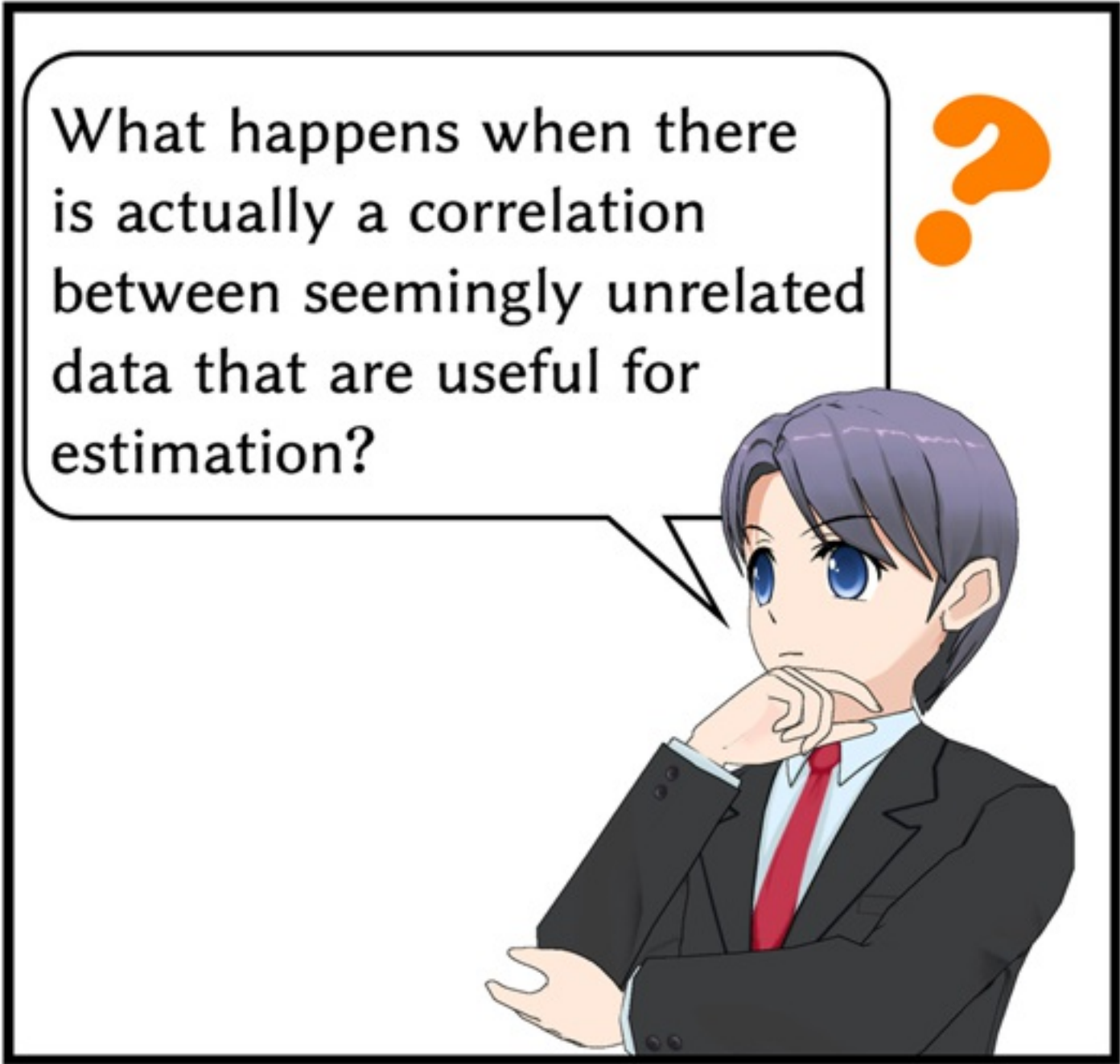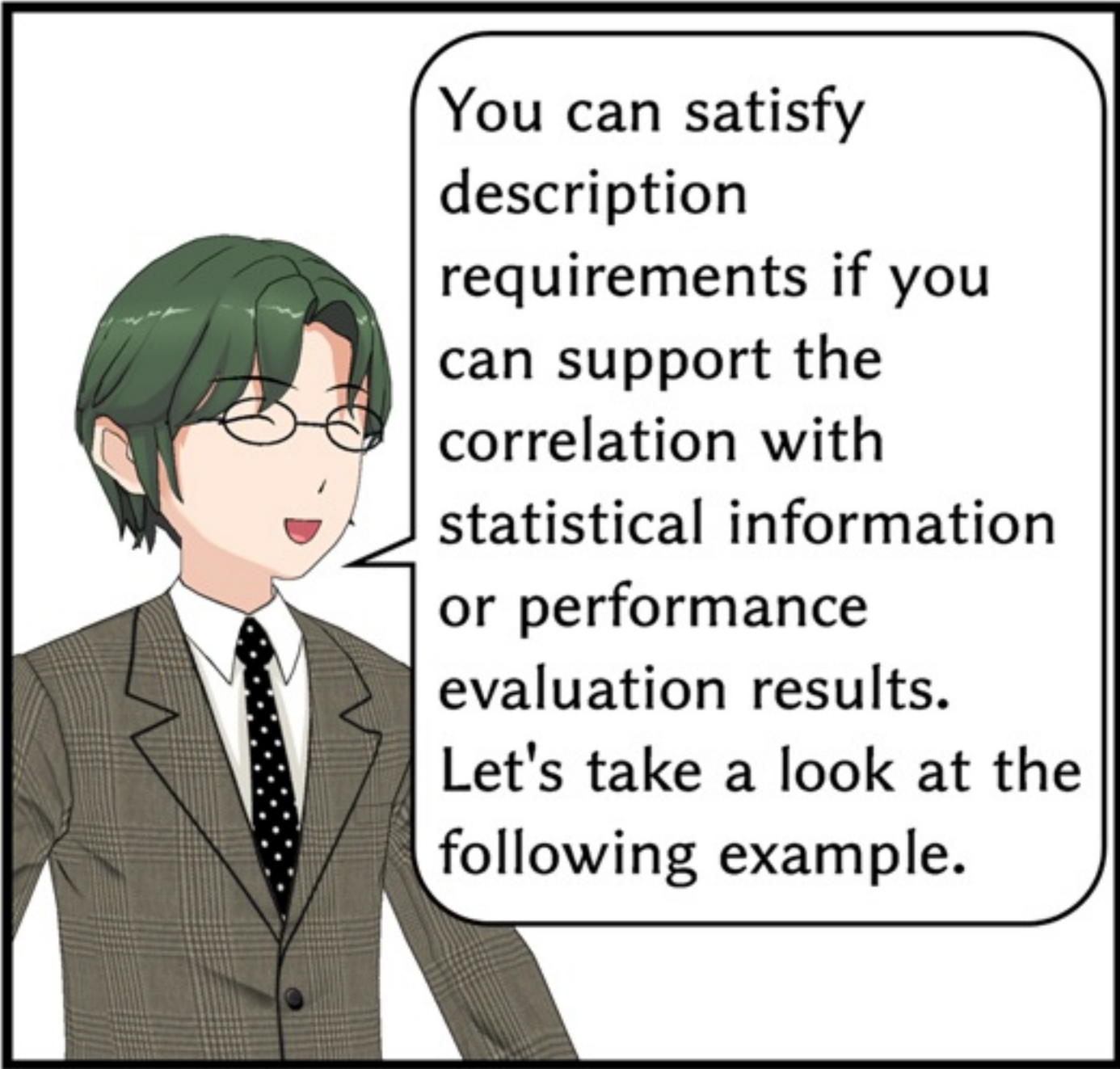

The description does not disclose any correlation or the like between a face image of a person and a sugar content of a vegetable.
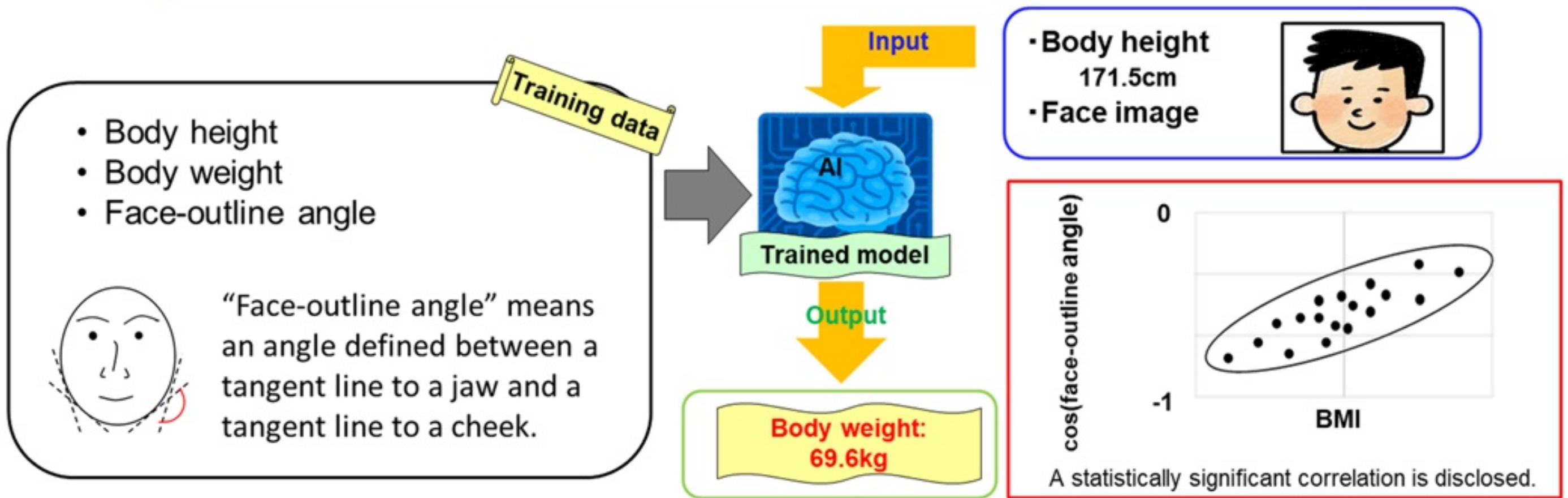→ Claim 1: Violation of Enablement Requirement.

Panel 1 (top left): You can satisfy description requirements if you can support the correlation with statistical information or performance evaluation results. Let's take a look at the following example.

Panel 2 (top right): What happens when there is actually a correlation between seemingly unrelated data that are useful for estimation?

Body weight estimation system

Training data
- Body height
- Body weight
- Face-outline angle

"Face-outline angle" means an angle defined between a tangent line to a jaw and a tangent line to a cheek.

Input

AI
Trained model

Output

Body weight: 69.6kg

- Body height 171.5cm
- Face image

cos(face-outline angle) vs BMI

A statistically significant correlation is disclosed.

The description discloses that there is a statistically significant correlation between a cosine of a face-outline angle and BMI of a person.

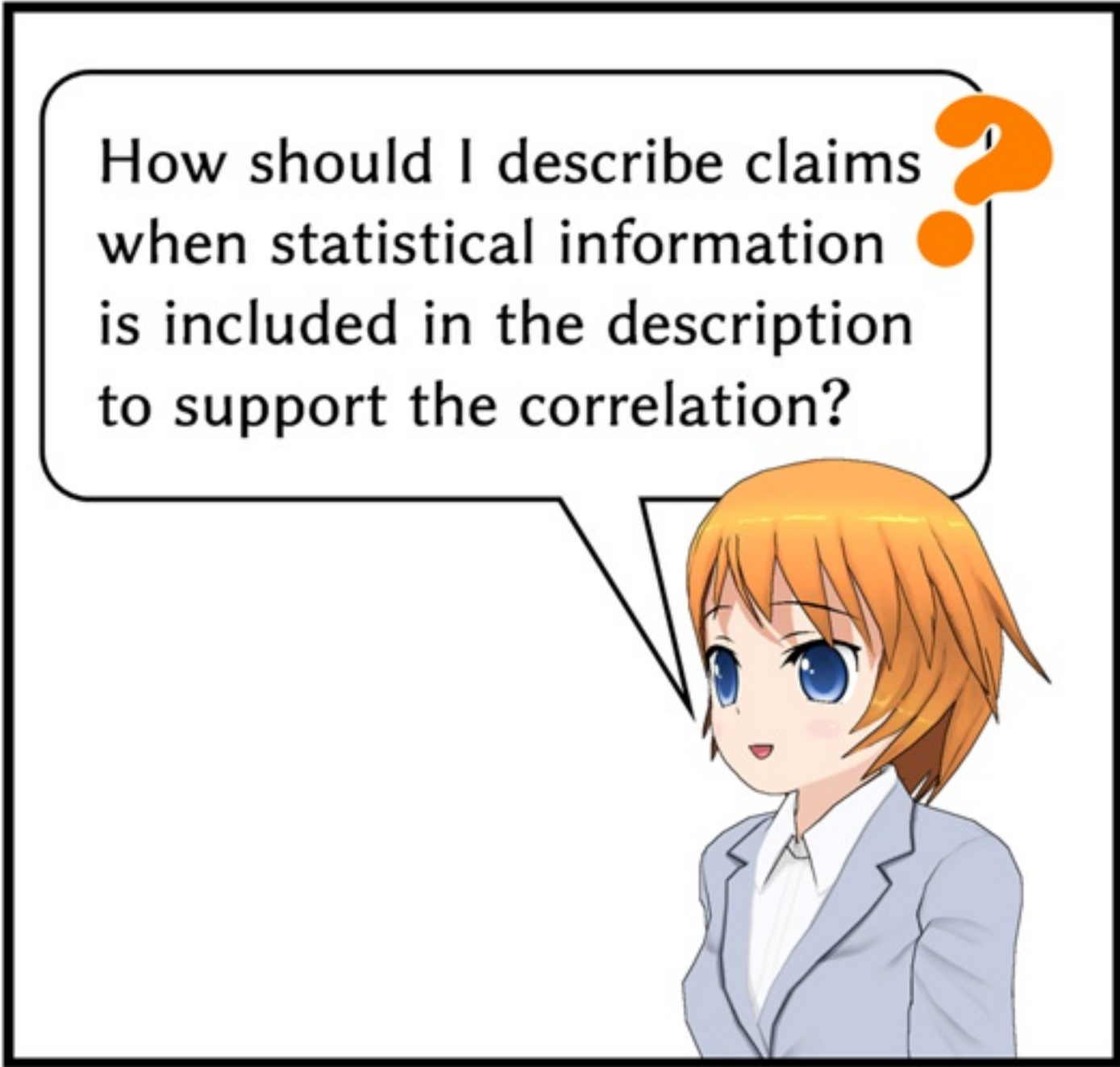**Panel (bottom left):** Even if the correlation cannot be inferred from common general technical knowledge, Description requirements can be satisfied if the correlation is supported in the description.

Panel (bottom right): I see. So there is a correlation between a face-outline angle and BMI of a person. I think I can create an AI that can estimate body weight from body height and face images.

You can describe the claim based on the statistical information in the description. Let's take a look at the claim in the previous example.

How should I describe claims when statistical information is included in the description to support the correlation?
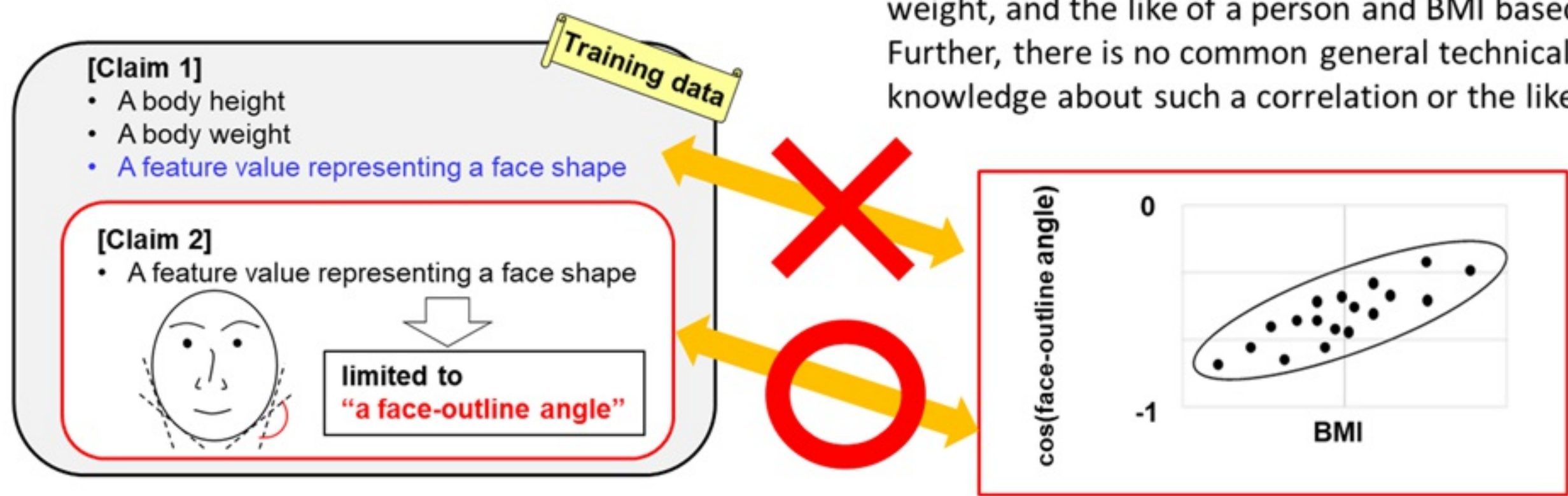
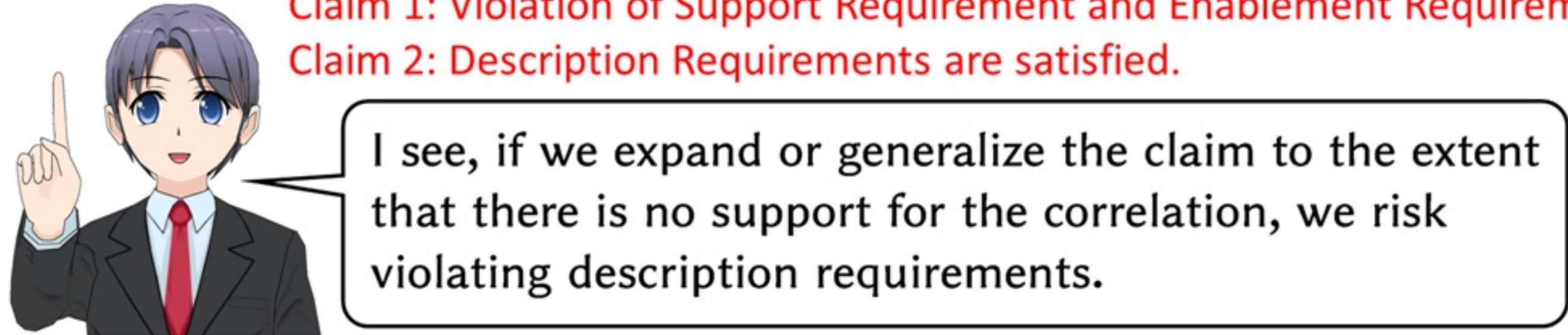## Body weight estimation system (cont.)

[Claim 1] (Examination Handbook Annex A, 1. Description Requirements, Case 49)
A body weight estimation system comprising:
  a model generation means for generating an estimation model that estimates a body weight of a person based on a feature value representing a face shape and a body height of the person, through machine learning using training data containing feature values representing face images as well as actual measured values of body heights and body weights of people;
  a reception means for receiving an input of a face image and body height of a person;
  a feature value obtainment means for obtaining a feature value representing a face shape of the person through analysis of the face image of the person that has been received by the reception means; and
  a processing means for outputting an estimated value of a body weight of the person based on the feature value representing the face shape of the person that has been received by the feature value obtainment means and the body height of the person that has been received by the reception means, using the generated estimation model by the model generation means.
[Claim 2]
The body weight estimation system as in Claim 1, wherein the feature value representing a face shape is a face-outline angle.

The description does not disclose a correlation or the like between (i) a feature value other than a face-outline angle representing a face shape and (ii) a body height, weight, and the like of a person and BMI based on these. Further, there is no common general technical knowledge about such a correlation or the like.

Training data

[Claim 1]
- A body height
- A body weight
- A feature value representing a face shape

[Claim 2]
- A feature value representing a face shape

limited to "a face-outline angle"

cos(face-outline angle) vs BMI

Claim 1: Violation of Support Requirement and Enablement Requirement.
Claim 2: Description Requirements are satisfied.

I see, if we expand or generalize the claim to the extent that there is no support for the correlation, we risk violating description requirements.
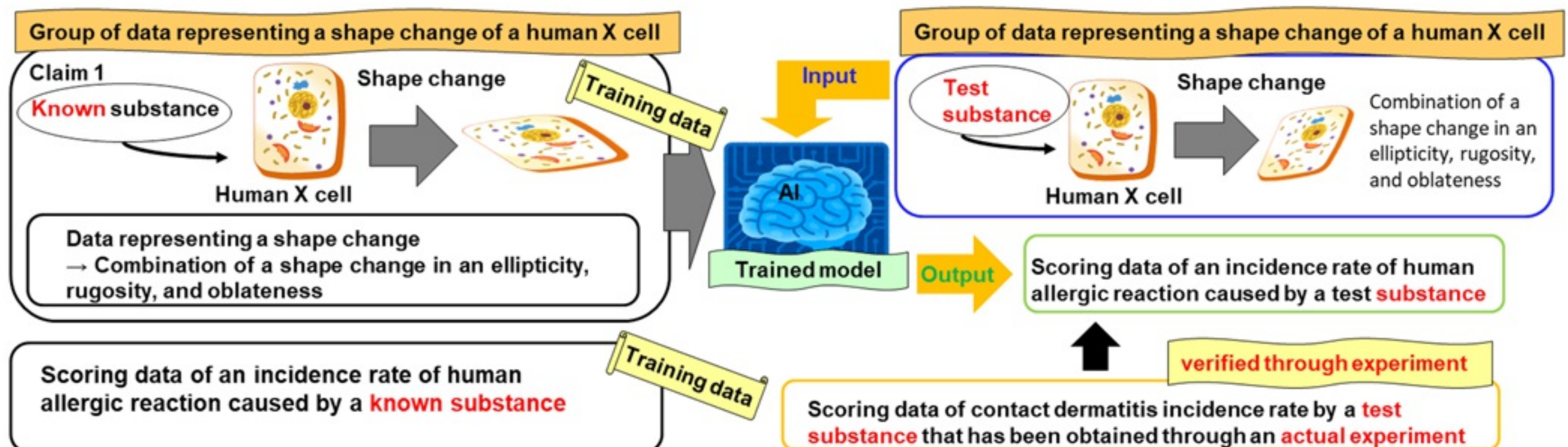
What you need to do is to verify that the estimation made by the AI is actually correct through experiments or the like, and describe the results.
Let's take a look at the following example.

AI performance evaluation can also support the correlation among training data.

Method for estimating allergy incidence rate of test substance

Group of data representing a shape change of a human X cell

Claim 1
Known substance → Human X cell → Shape change

Training data

Data representing a shape change
→ Combination of a shape change in an ellipticity, rugosity, and oblateness

Scoring data of an incidence rate of human allergic reaction caused by a known substance

Training data

Input

AI
Trained model

Output

Group of data representing a shape change of a human X cell

Test substance → Human X cell → Shape change

Combination of a shape change in an ellipticity, rugosity, and oblateness

Scoring data of an incidence rate of human allergic reaction caused by a test substance

verified through experiment

Scoring data of contact dermatitis incidence rate by a test substance that has been obtained through an actual experiment

① Train the AI to learn what shape changes occur in terms of ellipticity, rugosity, and oblateness when adding candidate substances, of which contact dermatitis incidence rate is known, to a human X cell.
② AI predicts the incidence rates caused by the test substance based on the shape change caused by the test substance in human X cells.
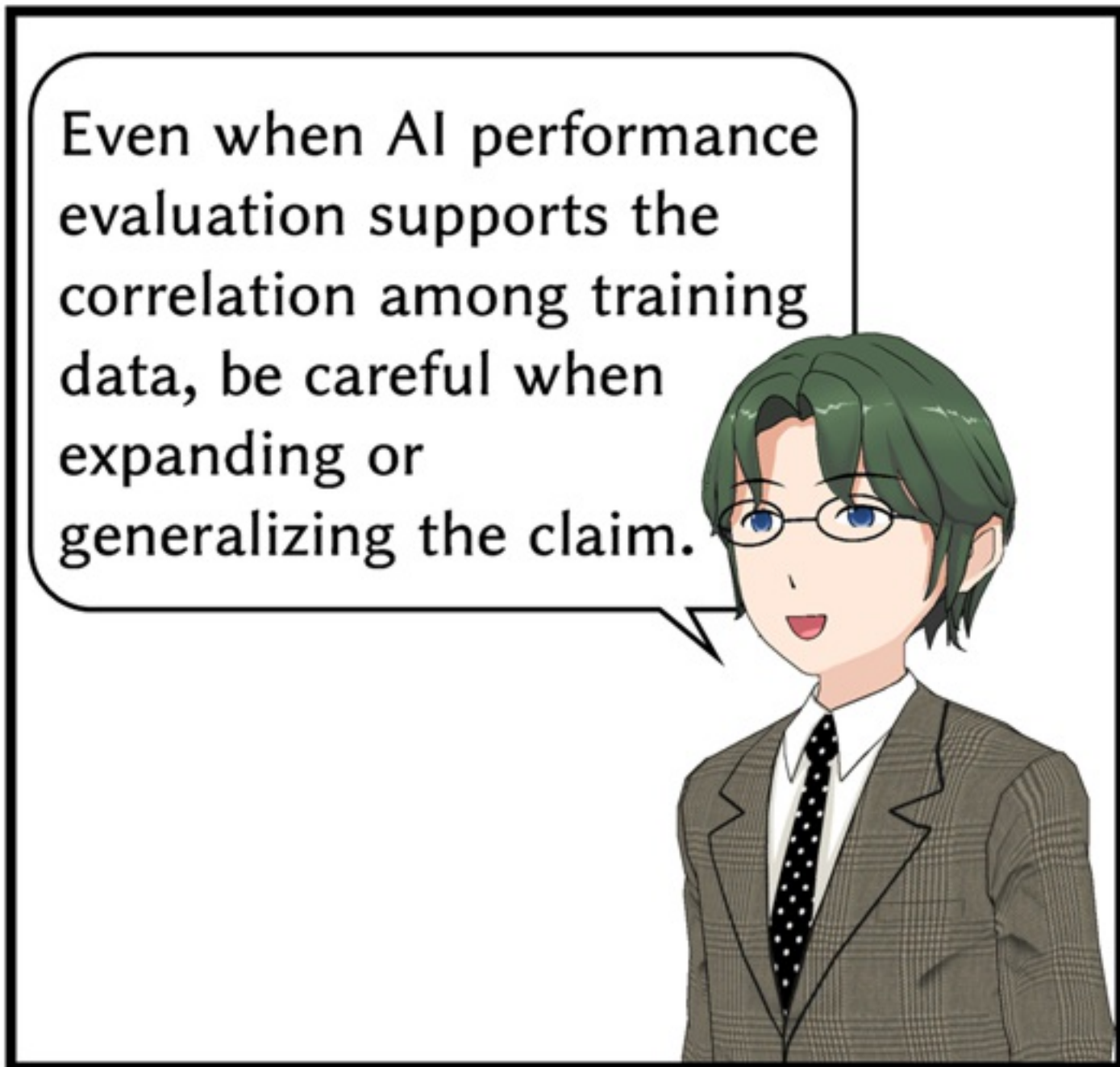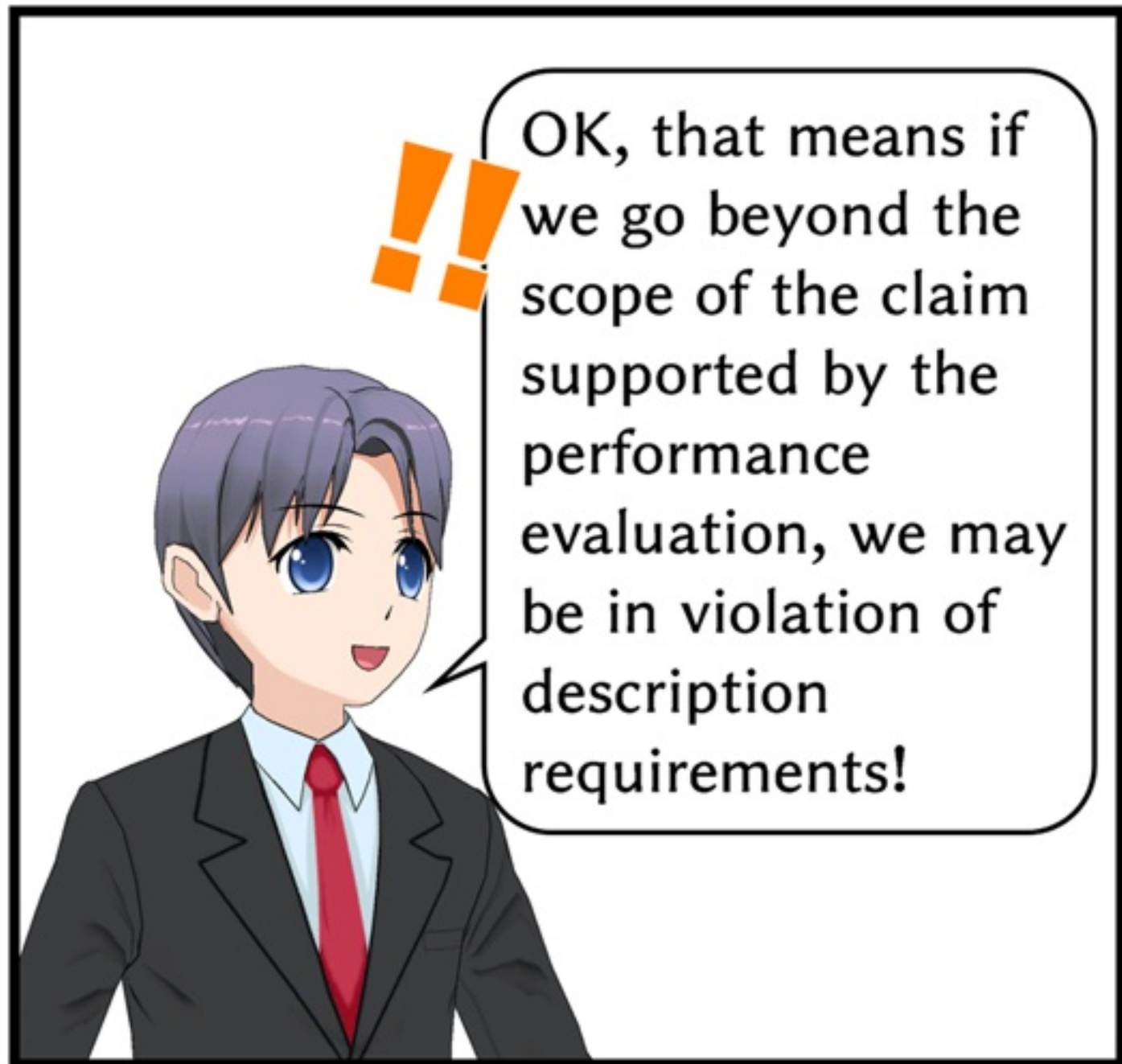③ Verify incidence rates through actual experiment.

Let's see.
By comparing the AI predictive data with the data from the actual performance evaluation experiment, it shows that the AI is accurate enough.
So, there seems to be a correlation among training data.

Description Requirements are satisfied by verifying the prediction results of AI through actual experiments !

This is an AI that estimates how likely a test substance is to cause contact dermatitis in humans.

OK, that means if we go beyond the scope of the claim supported by the performance evaluation, we may be in violation of description requirements!

Even when AI performance evaluation supports the correlation among training data, be careful when expanding or generalizing the claim.

Method for estimating allergy incidence rate of test substance (cont.)

[Claim 1] (Examination Handbook Annex A, 1. Description Requirements, Case 50)
A method for estimating an allergy incidence rate of a test substance in a human being comprising:
  inputting a training data to an artificial intelligence model to train the model, the training data including a group of data representing a shape change of a human X cell in culture solution and a scoring data on incidence rates of human allergic reaction caused by each substance, in which each of the substances is separately added to the culture solution and the incidence rates of human allergic reaction caused by each of the substances are already known;
  obtaining a group of data representing a shape change of a human X cell that has been measured in culture solution to which a test substance is added;
  inputting, to the trained artificial intelligence model, the group of data representing a shape change of a human X cell that has been measured in the culture solution to which the test substance is added; and
 causing the trained artificial intelligence model to calculate a scoring data of an incidence rate of human allergic reaction.
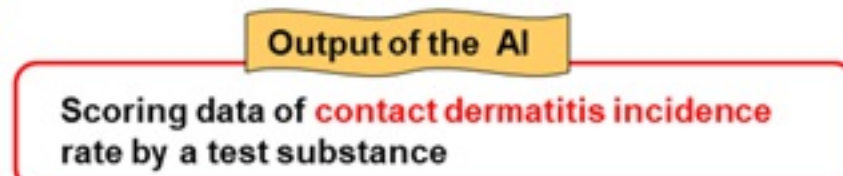**[Claim 2]**
The method for estimating an allergy incidence rate as in Claim 1, wherein the group of data representing a shape change of a human X cell is a combination of a shape change in an ellipticity, rugosity, and oblateness of the human X cell; and the allergic reaction is contact dermatitis.

Group of data representing a shape change of a human X cell

[Claim 1]
Known substance — Shape change — Training data
Human X cell

[Claim 2] shape change
→ limited to a combination of a shape change in an ellipticity, rugosity, and oblateness

[Claim 1]
Scoring data of an incidence rate of human allergic reaction caused by a known substance
[Claim 2] allergic reaction
→ limited to contact dermatitis

Training data
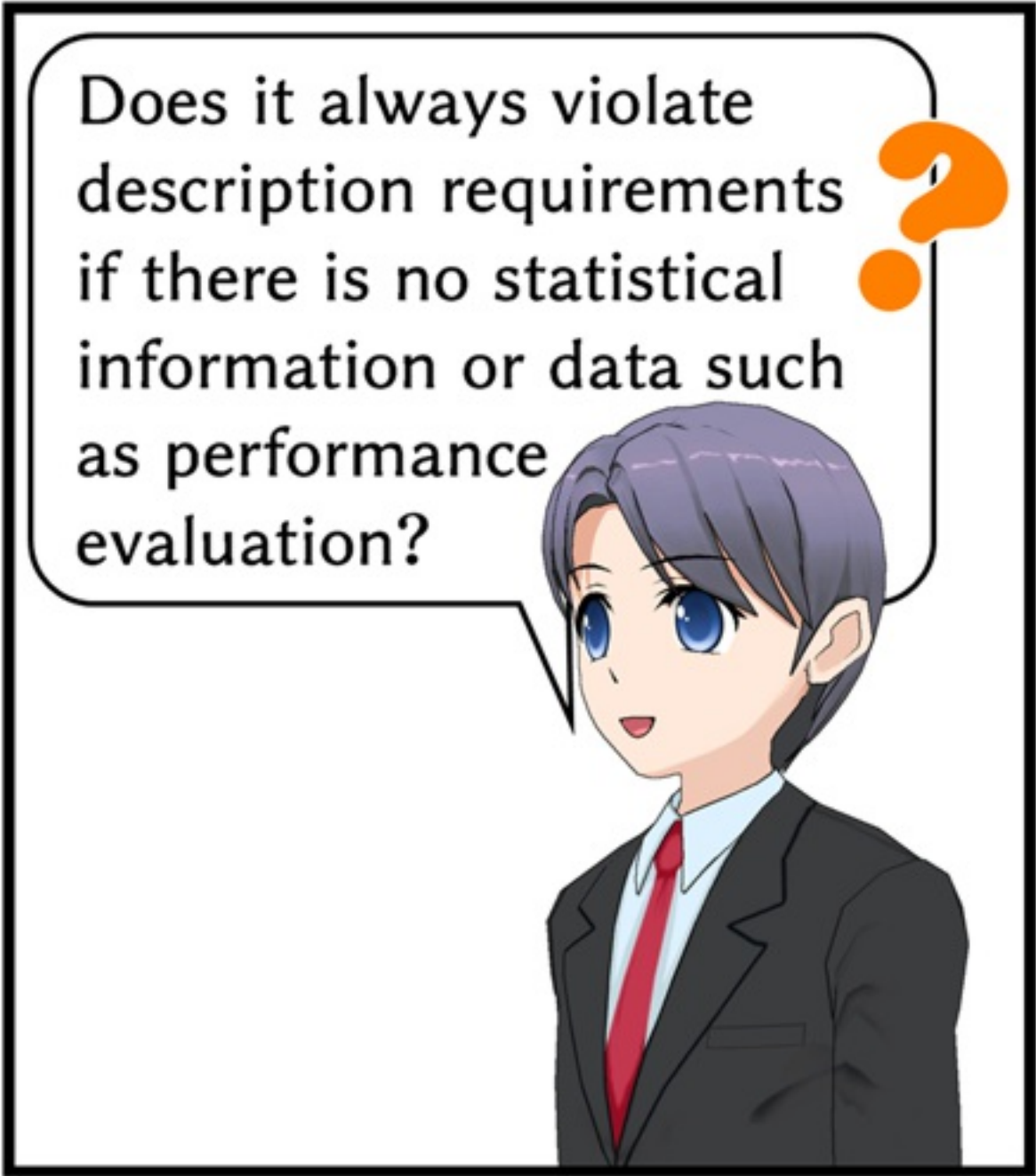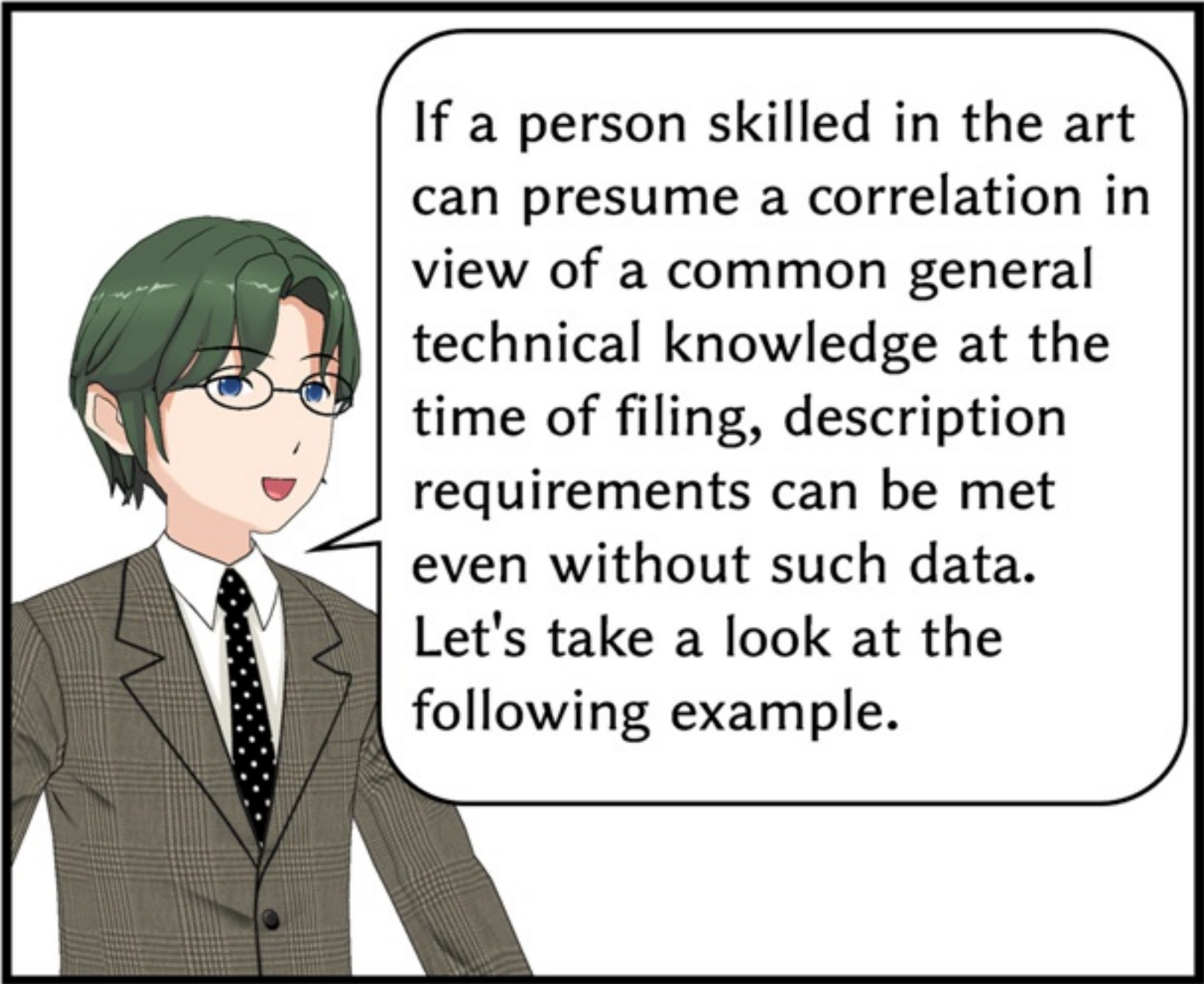
This description only supports the correlation among shape changes in ellipticity, rugosity, and oblateness and the contact dermatitis incidence.

There is no performance evaluation for shape changes other than the combination of a shape change in an ellipticity, rugosity, and oblateness.
Furthermore, that is not a common technical knowledge.

Input to the AI
Test substance — Shape change — Combination of a shape change in an ellipticity, rugosity, and oblateness
Human X cell
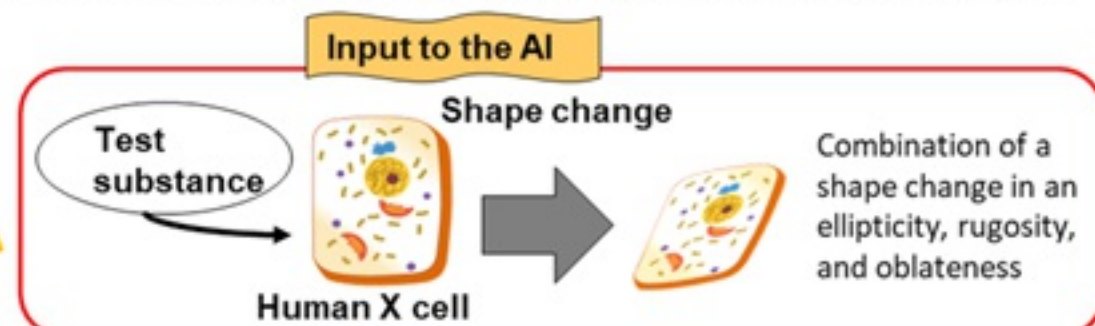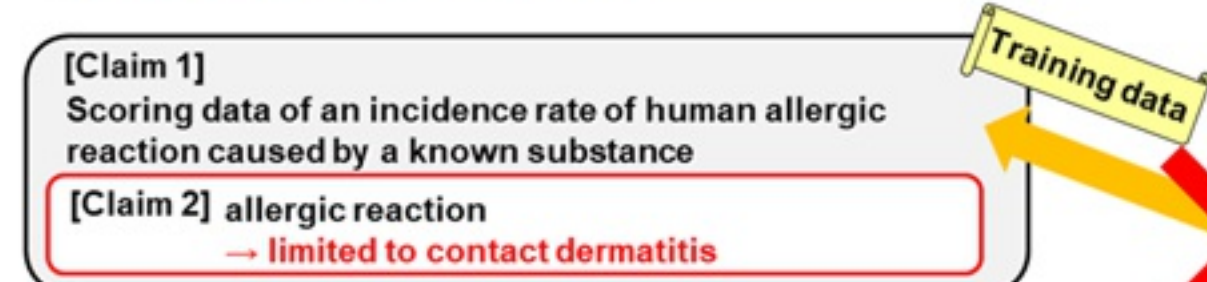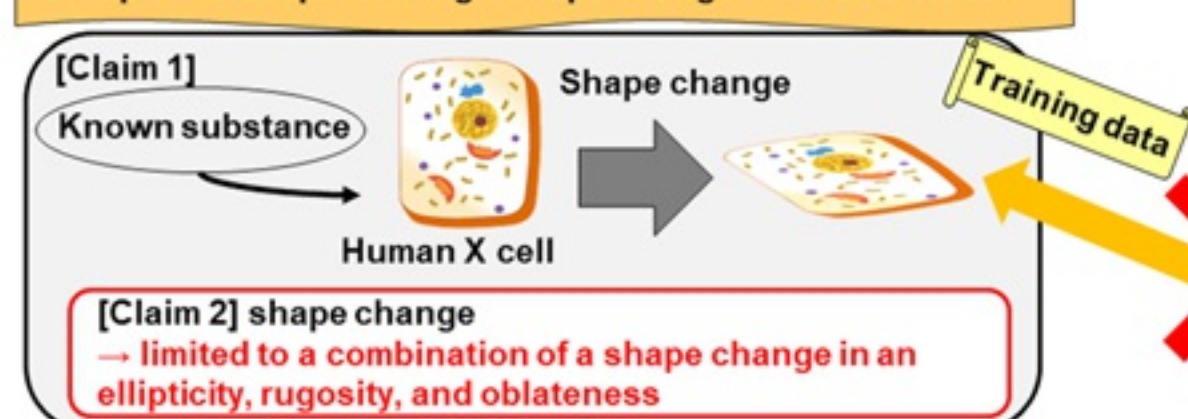
There is no performance evaluation for allergies other than contact dermatitis incidence.
Furthermore, that is not a common technical knowledge.

Output of the AI
Scoring data of contact dermatitis incidence rate by a test substance

verified through experiment

Scoring data of contact dermatitis incidence rate by a test substance that has been obtained through an actual experiment

Claim 1: Violation of Support Requirement and Enablement Requirement.
Claim 2: Description Requirements are satisfied.

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Business plan design apparatus

(Examination Handbook Annex A, 1. Description Requirements, Case 47)
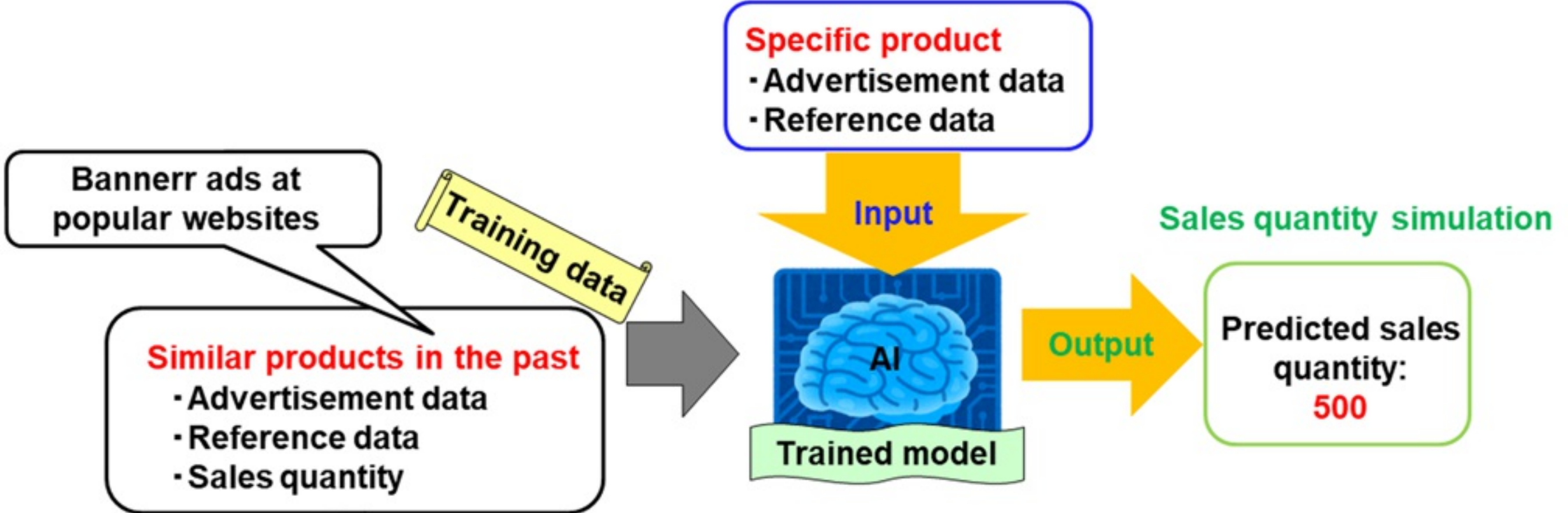
If there is no common general technical knowledge in the technical field that an AI predictive result can be a substitution of an actual experimental result, it may be a violation of description requirements.
Let's take a look at the following example.

If I want to get a patent for something that has a certain function predicted by AI, do I just describe that AI predicted it?

Anaerobic adhesive composition

[Claim 1] (Examination Handbook Annex A, 1. Description Requirements, Case 51)
An anaerobic adhesive composition comprising: a 0.08 - 3.2 mass % compound A, a 0.001 − 1 mass % compound B, and a residue containing an anaerobically curable (meth)acrylate monomer, wherein the anaerobic adhesive composition shows the curing strength equal to or exceeding 30 % of the curing strength after 24 hours have passed, within 5 minutes from the start of curing.

Training data

- Data on the composition of an anaerobic adhesive composition
- Data on the curing strength within 5 minutes from the start of curing
- Data on the curing strength after 24 hours have passed

Q: What is a composition of an anaerobic adhesive with a curing strength equal to or exceeding 30 %?

A: An anaerobic adhesive composition having a desired curing strength includes:

compound A ○%
compound B △%

Finished product？？

There is no disclosure provided as to an actual production or measurement of a curing strength.

Learning · · ·

AI

Trained model

There was no common technical knowledge at the time of filing that an estimation result by a trained model can be a substitution for an actual experimental result.

I wonder if the anaerobic adhesive that cures rapidly was actually made···.
The increase in curing strength of anaerobic adhesives is very difficult to predict due to the various manufacturing conditions involved···.

The AI has predicted the composition of an anaerobic adhesive that has the ability to cure rapidly.

Claim 1: Violation of Support Requirement and Enablement Requirement.

Thank you, Mr. Shinsaki, for all the information you've given to us. My understanding is still vague, but I think I was able to understand some of it.

Look, it's getting late. There are some cases that I couldn't introduce today. Check out more AI-related case examples on the website.

Newly Added Case Examples for AI-related Technologies
2019
Examination Standards Office
Japan Patent Office

https://www.jpo.go.jp/e/system/laws/rule/guideline/patent/ai_jirei_e.html

Ai, let's not leave everything to others.

Well, now I realized there is more to a patent than meets the eye… Now I'd like to consult with a patent attorney about our company's technology. Ota, please find me a good patent attorney!

But even so, I think you could make better use of such experts if you had some understanding of Patent Examination Guidelines! Best of luck on your venture!

Ai has got a point. Getting a patent is probably not the only purpose of your business, and you don't have to figure it all out on your own.

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