# Appendices

ORIGINAL

# Topics of Discussions

**for Collaborative Meeting between <Office Name> and ERIA to Discuss Patentability Requirements in View of Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent & Trademark Office on behalf of the ERIA

This is to lay the groundwork for the <Office Name>-ERIA discussions to understand your office's current positions concerning and attitude towards the patent examination guidelines, in particular "patentability" issues for the artificial intelligence related patent application (hereinafter referred to as "AI application[i]"). The Case Examples for the purpose of this document refer to three exemplified hypothetical inventions presented by the Japan Patent Office (JPO) for the 2019 ASEAN-Japan Heads of Intellectual Property Offices Meeting in Tokyo.

This <Office Name>-ERIA discussion is originally derived from the agreement of the 2018 ASEAN-Japan Summit to develop the patent examination guidelines in IP Offices in ASEAM member countries. The 2019 ASEAN-Japan Heads of Intellectual Property Offices Meeting further confirmed that the participating member countries will contribute to the case study being conducted by the ERIA[ii].

Under the leadership of the ERIA, Shobayashi International Patent & Trademark Office (SIPTO), one of the leading IP law firms in Tokyo, provides the ERIA with collaborative assistance to undertake this comparative research for this purpose.

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The <Office Name>-ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of <Office Name>, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines of <Office Name>.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:

(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),

(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent."
This Case Example particularly focuses on the judgement concerning what would constitute an "invention."
The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step."
And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.
The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements."
This Case Example would disclose the requirements how the description and claims should be described.
The title of the Case Example is "Business Plan Design Apparatus."

**TOPICS OF DISCUSSIONS:**

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   YES NO IF NO to this question, please go to Question No.14.

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2.

   YES NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

| *Response to Question No. 3:* |
| --- |
| |

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).

   NO (a) = The guidelines are publicly available only in the _____ language.

   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2) to externalize the particular ideas of the patentability for such technology.

   YES = The AI part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2) to externalize the particular ideas of the patentability for such technology.

   (YES) = The BM part of the guideline has all patentability criteria as below:

   (NO) = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2) to externalize the particular ideas of the patentability for such technology.

    (YES) = The Iot part of the guideline has all patentability criteria as below:

    (NO) = Only the following criterion/criteria: N/A

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games. YES, as follows | N/A

*Response to Question No. 11:*

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

YES NO IF NO, any intention to include such examples or the like in the future guidelines? YES NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

YES NO

For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. **<For Offices with examination guidelines established>**

When the Office receives the AI application, your Office makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

| *Technical area/field where the AI patent application is dealt with in response to Question No.14:* |
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14. **<For Offices without examination guidelines established>**

<Jumped from Question No.1> Even though your Office has not yet had the patent examination guidelines finalized in writing, the patent applications which <Office Name> receives are to be dealt with in the following manner. Explain briefly how your Office would conduct patent examination in the Office.

| *Methodologies in your Office how to in response to Question No.14:* |
|---|
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14-1. **<For Offices without examination guidelines established>**

When the Office receives the AI application, your Office makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO

IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

IF NO, please tell us how your Office would handle AI applications.

*Response to Question No.14-1:*

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.

- ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
  Any assistance to seek?
- ✓ Any foreseeable improvements you would make to the present guidelines?
- ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
- ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
- ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

16. For forthcoming discussions with <Office Name> (either by email or web-meeting), I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your office.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

| *Response to Question No. 16-1:* |
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16-2. Total number of the patent examiners in your office and, among them, the number of examiners in your office who may deal with AI applications:

| *Response to Question No. 16-2:* |
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| |

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

| *Response to Question No. 16-3:* |
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16-4. Any experience in examining AI applications by the participating examiners:

| *Response to Question No. 16-4:* |
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16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

| *In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:* |
|---|
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**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2** of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the JPO's three Case Examples. We would be pleased if we conduct discussions either online or in writing through email exchanges based on your observations concerning the following Case Examples.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

> In answering the following questions or even adding your own questions, please do not hesitate to add sentences as you like, but in an apparent and outstanding manner (Writing your comments in *italics*, underlined, **bolded** or even indentation will do).

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## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent
**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

> *Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g., a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

17-2. If disagree, please explain your basis why this invention does NOT fall under the concept of eligible "invention."

18. This invention specifies the following algorithms.
    (i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
    (ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
    (iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
    The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
    The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

    18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

    18-2. If disagree, please explain your basis why this invention does NOT fall under the category of a creation of the technical idea utilizing the laws of nature.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

    19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

    19-2. If disagree, please explain how CS invention is to be examined in your Office. Any guidelines or manuals specifically focus on the examination processes and procedures for CS invention, as the USPTO has?

    19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
    If so, please explain how your Office defines the business model inventions.

■ **CASE EXAMPLE 2: <u>Assessment of Inventive Step</u>**
**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

20-2. If disagree, please explain which categories a "system" invention falls under in your guidelines.

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

21-2. If disagree, please explain the differences in determining the inventive step with regard to that invention.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.
    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.
    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

22-2. If disagree, please explain how your Office observes the inventive step in the claim 2 of the invention.

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."
    Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
    If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
    (i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
    (ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
    (iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

    The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

    24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

    24-2. If disagree, please explain your basis why your Office does not adopt the concept of "presumed" correlation.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

25-2. If disagree, please explain your basis why your Office does not recognize that the estimation model would generate the apparatus designing business models.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

26-2. If disagree, please explain how you define the enablement requirement under your examination guidelines.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

Any questions or clarifications concerning this document on the <Office Name>-ERIA meeting topics, do not hesitate to contact me:

SHOBAYASHI INTERNATIONAL
PATENT & TRADEMARK OFFICE

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SHOBAYASI INTERNATIONAL PATENT & TRADEMARK OFFICE (SIPTO)

[i] Although AI can be defined in various ways, it is understood that the JPO mainly defines (1) AI core invention and (2) AI-applied Invention as "AI-related invention." This is however not an official or agreed definition of the terminology: "AI."

(1) AI core invention (mainly IPC: G06N3), G06N5 and G06N20:
"G06N3": Inventions characterized by mathematical or statistical information processing technology that forms the basis of AI, such as various machine learning methods including neural network, deep learning, support vector machines, reinforcement learning, in addition to knowledge-based models and fuzzy logic, etc.
"G06N5": Computer systems using knowledge-based models
"G06N20": Machine learning

(2) AI-applied Invention:
Inventions characterized by applying the said AI core invention to various technical fields such as image processing, speech processing, natural language processing, device control/robotics, various diagnosis / detection / prediction / optimization system, etc.

[ii] Extraction from "JOINT STATEMENT" by the Ninth ASEAN-JAPAN Heads of Intellectual Property Offices Meeting:

> 5. In particular, the Partners, in taking special notice of the fact that the Chairman's Statement of the 2018 ASEAN-Japan Summit urged the development of patent examination guidelines in AMS IP offices, confirmed that they will contribute to the case study being conducted by the Economic Research Institute for ASEAN and East Asia (ERIA), the aim of which is to enhance the predictability of patent examination results. In addition, the Partners agreed to undertake initiatives that address translation issues that may arise in the patent application process, in order to enhance connectivity among ASEAN Members States and Japan

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# Topics of Discussions

**for Collaborative Meeting between BruIPO and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent & Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   YES NO IF NO to this question, please go to Question No.14.

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

| *Response to Question No. 3:* |
|---|
| |

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).
   NO (a) = The guidelines are publicly available only in the _____ language.
   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The AI part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The BM part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    YES = The Iot part of the guideline has all patentability criteria as below:

    NO = Only the following criterion/criteria: N/A

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games. YES, as follows | N/A

    *Response to Question No. 11:*

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

    YES | NO IF NO, any intention to include such examples or the like in the future guidelines? YES | NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES | NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. **<Jumped from Question No.1, if applicable>** Even though your Office has not yet had the patent examination guidelines finalized in writing, the patent applications which the BruIPO receives are to be dealt with in the following manner. Explain briefly how your Office would conduct patent examination in the Office.

*Methodologies in your Office how to in response to Question No.14:*

After an application is filed, the BruIPO will conduct preliminary examination on three areas:

1. Compliance with Formal Requirements
2. If any part of the Description or Drawings is missing from the applications as filed, i.e., Missing Parts
3. If the date of filing of any declared priority applications more than 12 months before Date of Filing of the Brunei application

If all requirements are met, the BruIPO will forward the documents to Foreign Examiners who will then do the Search process work to discover prior art and Examination works on patentability, unity of invention, disclosure of invention, claims. If any of the criteria are not met, a further Written Opinion will be issued for applicant to respond.

14-1. When the Office receives the AI application, your Office makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO

IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

IF NO, please tell us how your Office would handle AI applications.

*Response to Question No.14-1:*

After conducting preliminary examination, the BruIPO will send the applications to the foreign office which does the search and examination and the one who will identify the relevant technical field.

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.

- ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
  Any assistance to seek?
- ✓ Any foreseeable improvements you would make to the present guidelines?
- ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
- ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
- ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

16. For forthcoming discussions with the BruIPO (either by email or web-meeting), I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your Department.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

The BruIPO does not have information on the type of patents or classifications as the substantive examination is done by our examiners in Denmark Patent Office

16-2. Total number of the patent examiners in your Department and, among them, the number of examiners in your office who may deal with AI applications:

*Response to Question No. 16-2:*

Currently, there are only 2 patent formality examiners whilst substantive examination is outsourced to Denmark Patent office.

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

*Response to Question No. 16-3:*

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the JPO's three Case Examples. Of course, any response from the BruIPO prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

*General comments by the DIGP in responding to the following questions:*

**<NOTE> The BruIPO would like to reserve its official judgements on the following questions concerning Case Examples, for the Office does not yet conduct substantive examination on patents.**

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## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

17-2. If disagree, please explain your basis why this invention does NOT fall under the concept of eligible "invention."

18. This invention specifies the following algorithms.
    (i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
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    (iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
    The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
    The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

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19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

    19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

    19-2. If disagree, please explain how CS invention is to be examined in your Office. Any guidelines or manuals specifically focus on the examination processes and procedures for CS invention, as the USPTO has?

    19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
    If so, please explain how your Office defines the business model inventions.

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

20-2. If disagree, please explain which categories a "system" invention falls under in your guidelines.

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

21-2. If disagree, please explain the differences in determining the inventive step with regard to that invention.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.
    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.
    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

22-2. If disagree, please explain how your Office observes the inventive step in the claim 2 of the invention.

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."
    Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
    If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
    (i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
    (ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
    (iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

    The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

24-2. If disagree, please explain your basis why your Office does not adopt the concept of "presumed" correlation.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

25-2. If disagree, please explain your basis why your Office does not recognize that the estimation model would generate the apparatus designing business models.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

26-2. If disagree, please explain how you define the enablement requirement under your examination guidelines.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

KH

# Topics of Discussions

**for Collaborative Meeting between**
**Department of Industrial Property of Cambodia, Ministry of Industry, Science, Technology & Innovation (DIP/MISTI) and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent
& Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Department are already available in a form of document (either on paper or electronically).

   YES NO IF NO to this question, please go to Question No.14.

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

| *Response to Question No. 3:* |
|---|
| |

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).
   NO (a) = The guidelines are publicly available only in the _____ language.
   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The AI part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The BM part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    YES = The Iot part of the guideline has all patentability criteria as below:

    NO = Only the following criterion/criteria: N/A

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games. YES, as follows | N/A

    *Response to Question No. 11:*

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Department's patent examination.

    YES NO IF NO, any intention to include such examples or the like in the future guidelines? YES NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. **<Jumped from Question No.1, if applicable>** Even though your Department has not yet had the patent examination guidelines finalized in writing, the patent applications which the DIP/MISTI receives are to be dealt with in the following manner. Explain briefly how your Department would conduct patent examination in the Department.

*Methodologies in your Department how to in response to Question No.14:*

In the DIP/MISTI, we conduct only formal examination for all of patent applications. To reinforce our current situation, we made cooperative measures with other IP offices, so that we can recognize and directly utilize their offices' results of patent substantive examinations.

For example, we have Cooperation for Facilitating Patent Grant (CPG) with the JPO, Patent Cooperation with the KIPO and USPTO, Patent Validation Agreement with the EPO and Re-Registration of patent with the IPOS and CNIPA.

With such cooperation, the applicants from those countries can ask for patent grant in a short period of time by submitting the DIP/MISTI with the required documents, provided that the application filed with the DIP/MISTI is identical with a certified copy of the patent specification which was originally filed with one of those IP offices in cooperative relationship.

For patent applications which are to be filed locally in Cambodia, we encourage the applicants of such applications to go through patent substantive examination conducted initially by those cooperated IP offices or their preferred IP offices.

14-1. When the Department receives the AI application, your Department makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO

IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

IF NO, please tell us how your Department would handle AI applications.

*Response to Question No.14-1:*

As stated above on how the DIP/MISTI conducts the patent substantive examination, if an application, including an AI application, files through or requests for a grant through such patent cooperation programs, and if such an application fulfills with our requirement, we will grant patents.

As such, our office is dependent on other IP offices in terms of conducting the substantive examination, neither concrete rules nor guidelines are yet available for AI-related applications.

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
    - ✓ Any other messages?

16. For forthcoming discussions with the DIP/MISTI (either by email or web-meeting), I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your Department.

*Any other comments or notes in response to Question No.15:*

Regarding patent examination guidelines, our possibility is that we establish our own patent guideline with the assistance from other IP offices or we may follow the ASEAN patent guideline, which is under progress.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Department has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

16-2. Total number of the patent examiners in your Department and, among them, the number of examiners in your Department who may deal with AI applications:

*Response to Question No. 16-2:*

4 people in the office in charge of patents.
Among them, 3 people deal with all patent examination.

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

*Response to Question No. 16-3:*

No technical background related to AI invention.

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

No experience.

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

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**"Business Plan Design Apparatus"**

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    (i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
    (ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
    (iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

    The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

24-2. If disagree, please explain your basis why your Department does not adopt the concept of "presumed" correlation.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

25-2. If disagree, please explain your basis why your Department does not recognize that the estimation model would generate the apparatus designing business models.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

26-2. If disagree, please explain how you define the enablement requirement under your examination guidelines.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Department requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

ID

# Topics of Discussions

**for Collaborative Meeting between DGIP and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent &
Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   YES NO

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

*Response to Item No. 3:*

1. Law of Republic of Indonesia Number 13 of 2016 about Patent
   (use for patent filing in and after August 26th, 2016)
2. Law of Republic of Indonesia Number 14 of 2001 about Patent
   (use for patent filing before August 26th, 2016)
3. Regulation of the Minister of Law and Human Rights
   Republic of Indonesia No. 38 of 2018 about Patent Filing.
4. <Patent Examination Guidelines>
   Decree of the Directorate General of Intellectual Property
   No. H.08. PR.09.10 of 2007
   about Guideline of Patent Substantive Examination.

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).

   NO (a) = The guidelines are publicly available only in the _____ language.

   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to the item No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   = The AI part of the guideline has all patentability criteria.

   N/A

   = Only the following criterion/criteria:

8. IF YES to the item No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria:

   Eligibility | Novelty and Inventive Step | Description Requirements

   <Note by DGIP> Description Requirements are provided for in the general patent guidelines, not in the separate **CS** part of the guideline.

9. IF YES to the item No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The BM part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria:

   Eligibility | Novelty and Inventive Step | Description Requirements

   <Note by DGIP> Description Requirements are provided for in the general patent guidelines, not in the separate **BM** part of the guideline.

10. IF YES to the item No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    N/A

    = The Iot part of the guideline has all patentability criteria as below:

    = Only the following criterion/criteria:

11. IF NO to the item No.6 (no separated guidelines for the emerging technologies), or even YES to the item No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games.

    YES, as follows

*Response to Question No.11:*

Since separate guidelines concerning AI and IoT are not yet available in the Office, the Office members works together by gathering their own technical expertise to deal with such AI-related applications. The members also have to learn a lot to cope with new matters.

Japan International Cooperation Agency: JICA is helpful to facilitate learning process for the Office members to acquire knowledge base.

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

    YES NO

    IF NO, any intention to include such examples or the like in the future guidelines?

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, i.e., the invention is the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. When the Office receives the AI application, your Office makes it a rule to deal with such application in a particular technical area(s)/field(s).

    YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

*Technical area/field where the AI patent application is dealt with in response to Question No.14:*

Electrical Engineering

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI application, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?

*Any other comments or notes in response to Question No.15:*

The DGIP works in a team to enrich the content of the examination guidelines and makes its efforts to cover AI and IoT technologies in additional guidelines. The Office's major concern is the lack of technical information concerning the emerging technologies (thus, three Case Examples presented were currently difficult to deal with).

With regard to the promulgation of the guideline either in the Indonesia language or English, the Office should follow the general government policy on how to get government information open to the public.

16. In the DGIP-ERIA discussion on November 25, 2019, we would like to start the meeting with the following questions about the *status quo* of the AI applications in your country and their filing with your Office. Please get the following questions ready to be answered in the meeting, while any feedbacks or answers are always welcome and appreciated even before the meeting.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please also specify the number of AI/CS applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Item No. 16-1:*

61 received so far (G06N3: 45 applications / G06N5: 16 applications)
(2 patent applications from Chinese applicant)
21 being examined (or finished examination)
(G06N3: 17 applications; G06N5: 4 applications)

16-2. Number of the staff members in your Office who may deal with AI applications:

*Response to Item No. 16-2:*

21 examiners = all of the DGIP patent examiners may possibly be appointed for AI applications after all relevant factors are considered

16-3. Technical backgrounds of the participating patent examiners to the meeting:

*Response to Item No. 16-3:*

Electrical Engineering; Pharmaceutical; Chemistry

16-4. Any experience in examining the AI applications by the participating examiners:

*Response to Item No. 16-4:*

Yes

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

- Lack of AI knowledge base
- Unfamiliar technical field
- Lack of detailed regulation related to AI and IoT

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the three Case Examples presented by the JPO. Of course, any response from the DGIP prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

*General comments by the DIGP in responding to the following questions:*

**<NOTE> The DGIP would reserve its official judgements on the following questions concerning AI Case Examples, for the Office needs to explore its position on how to conduct patent examination for the AI-related inventions.**

**Therefore, the following responses the Office presented below are the current general consensus and are subject to change, as the future discussions in this regard are to be evolved in the Office.**

**********

## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.17-1:*

**Agreeable:**

The DGIP would however find it difficult to rationally conclude that a trained model is a computer programing due to unfamiliarity to such technologies.

18. This invention specifies the following algorithms.
(i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
(ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
(iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature. Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.18-1:*

**Reservation in deciding a position:**

As answered to Question No.17 above, at this moment, the Office cannot decide that the Office can agree to the JPO's reasoning or not, because the term: "trained model" used in the AI discussion is a relatively new terminology for this Office.

Therefore, the DGIP inclines to reserve its positions for further internal discussions and comprehension of the technology.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

*Response to Question No.19-1:*

**Agree:**

The DGIP agrees to the criteria to observe the eligibility of the invention. As mentioned above, the Office considers that it would substantially be in line with the Office's definition of an invention, i.e., subject matter which is eligible for patent protection must have technical characteristics.

In this case, technical characteristics can substantially be interpreted as a combination of software and hardware, and there is a concrete mechanism realizing the collaboration between software and hardware resources.

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
If so, please explain how your Office defines the business model inventions.

*Response to Question No.19-3:*

The business model will be considered to be an invention, if it comes in the form of mixture between non-technical aspect (business method) and the technical aspect (technical means or technicality).

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No.20-1:*

**Agree:**

The DGIP also shares the same view with the JPO in this regard.

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.21-1:*

**Agree:**

The DGIP considers that the replacing the regression equation model with trained model as mention in claim 1 would be a mere modification of prior art without involving any inventive step.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.

(i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.

The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree, but further consideration needed:**

Some of the examiners in the DGIP agree in principle with the above-mentioned reasoning. Some other examiners may however have a slightly different view on this. Thus, at this moment, it is difficult to present an official position on this matter before the Office's further discussions.

23. If the answer to the Item No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."

*Response to Question No.23 (1):*

Based on the DGIP's examination guidelines, when assessing the inventive step of such a mixed-type invention (invention plus non-technical features), non-technical features are not taken into account, as non-technical features do not contribute to the technical character.

Non-technical features do however, in the whole context of the invention, contribute to producing a technical effect serving a technical purpose of the invention, thereby it would contribute to the technical character of the invention.

Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?

*Response to Question No.23 (2):*

No, the DGIP does not think so.
All features listed in Claim 1 and 2 in Case Example 2 are technical features.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
(i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
(ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
(iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.
The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**
The DGIP shares the view and reasoning with the JPO that the judgement is to be made by such assumption of a certain correlation or the like.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

25-2. If disagree, please explain your basis why your Office does not recognize that the estimation model would generate the apparatus designing business models.

*Response to Question No.25-1 and 25-2:*

**Agree:**

In our opinion based on aforementioned description, the apparatus, in order to generate the output data will utilize the estimation model as conventionally done by the machine learning.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

26-2. If disagree, please explain how you define the enablement requirement under your examination guidelines.

*Response to Question No.26-1 and 26-2:*

Basically, the DGIP is not yet in the position to agree or disagree, since the Office does not set up a requirement for description in a detailed manner such as how to make and how to use.

In the Office's guidelines, it is only stated that the description must disclose any features essential for carrying out the invention in sufficient detail to render it apparent to the skilled person how to put the invention into practice using his common general knowledge.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No.26-3:*

The DGIP has not used the terminology: "enablement requirement" in the context of the description requirement, thus even the general guideline does not have an equivalent provision for it.

The Office however observes that the same concept may be covered in ruling out the description requirements in the guidelines (such as sufficiency of describing and supporting an invention), so that the invention may be practiced.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

LA

# Topics of Discussions

**for Collaborative Meeting between Laos IP Department and ERIA to Discuss Patentability Requirements in View of Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent & Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Department are already available in a form of document (either on paper or electronically).

   YES NO IF NO to this question, please go to Question No.14.

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

| *Response to Question No. 3:* |
|---|
| |

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).

   NO (a) = The guidelines are publicly available only in the _____ language.

   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The AI part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The BM part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    YES = The Iot part of the guideline has all patentability criteria as below:

    NO = Only the following criterion/criteria: N/A

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games. YES, as follows | N/A

    *Response to Question No. 11:*

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Department's patent examination.

    YES NO IF NO, any intention to include such examples or the like in the future guidelines? YES NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. **<Jumped from Question No.1, if applicable>** Even though your Department has not yet had the patent examination guidelines finalized in writing, the patent applications which Laos IP Department receives are to be dealt with in the following manner. Explain briefly how your Department would conduct patent examination in the Department.

*Methodologies in your Department how to in response to Question No.14:*

Laos IP Department is now in the process of revising patent examination guidelines, of which the previous version was abolished some years ago, to cope with the recent changes of technology advancement. The new patent examination guidelines may possibly trigger Laos's substantive patent examination being conducted by Laos IP Department itself in future.

Until that time, Laos IP Department subsidizes the substantive examination to other IP Office(s). Once the patent application is forwarded to such an Office, the substantive patent examination should be conducted in line with the rules and guidelines of those recipient Offices.

Meanwhile, as Laos's general procedures for all patent applications,
the Department gives the formality check after it receives the application.
The Department checks whether the application fulfills the following conditions.

(a) if produced by other Offices is attached, the claimed invention in the new application is the same as
the prior examination result being granted patent by the first-filed Office.

(b) if NOT attached, the following two possibilities are considered;

b1: check if the applicant wishes to wait for the prior substantive examination result to be issued later (which is now under process) by other IP Office, or

b2: check if the applicant wishes to request Laos IP Department to proceed with that application and to conduct the substantive examination by a partner Office (which is now the IPOS).
(This may be the case where the application has been filed with the Department as a first-file application before the Department.)

In addition to the above-mentioned initial check, the Department then gives strict formality checks for other elements. Based on the results of the formality checks, the Department invites the applicant to amend the application, or forwards it to substantive examination by other IP Office, if applicable.

14-1. When the Department receives the AI application, your Department makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO

IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

IF NO, please tell us how your Department would handle AI applications.

*Response to Question No.14-1:*

The Department does not conduct substantive examination not only for AI-related applications, but other patent applications as well.

For related information related to Q14-1, the Department once starts examining such inventions substantively, we think that the Department may possibly be able to handle any new technologies in future, since our legislation does not specify certain technology areas or fields.

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.

- ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
  Any assistance to seek?
- ✓ Any foreseeable improvements you would make to the present guidelines?
- ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
- ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
- ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

- We have no plan for the guidelines addressing the emerging technologies, we would like to follow International Regulations to deal with.
- We also looking forward to ASEAN Common Guidelines on Patent Examination which would addressing the emerging technologies on it.
- Based on our practice on Patent Examination at the moment and ASEAN Action Plan on Establishing Patent Examination Guidelines in the near future, we would use this Guidelines to as a basis together with the previous one that we had under the assistance from JPO to make our own Guidelines more efficient in the future.

16. For forthcoming discussions with Laos IP Department (either by email or web-meeting), I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your Department.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Department has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

The Department has not yet received any AI/CS patent applications.

16-2. Total number of the patent examiners in your Department and, among them, the number of examiners in your Department who may deal with AI applications:

*Response to Question No. 16-2:*

The Department has only 1 examiner to review the search and examination results for all the applications received by the office.

The Department thus needs to train new examiners, especially for the purpose of utilizing the search and examination report from other offices.

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

*Response to Question No. 16-3:*

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the JPO's three Case Examples. We would be pleased if we conduct discussions either online or in writing through email exchanges based on your observations concerning the following Case Examples.

However, the following discussion topics are not meant to urge the Department to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Department to preview the points before we meet.

*General comments by the DIGP in responding to the following questions:*

**<NOTE> Laos IP Department would like to reserve its official judgements on the following questions concerning Case Examples, for the Department does not yet conduct substantive examination on patents.**

**The Department is however pleased to present some comments responding to some of the questions on Case Examples.**

**The following comments are made without prejudice to future changes possibly based on the upcoming examination guidelines.**

**********

## ■ CASE EXAMPLE 1: <u>Assessment of Eligibility of Patent</u>

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.17-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

18. This invention specifies the following algorithms.
(i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
(ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
(iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.18-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

*Response to Question No.19-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
If so, please explain how your Department defines the business model inventions.

*Response to Question No.19-3:*

The Department considers that the business model inventions are not regarded as being eligible as an invention.

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No.20-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO, for we consider that this invention belongs to "products."

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.21-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.

(i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.

The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Department gives the examination to the invention "with non-technical features."

Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?

If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
(i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
(ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
(iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.
The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**
The Department agrees with the opinion and decision by the JPO.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Department further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.25-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.26-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Department requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

MY

# Topics of Discussions

**for Collaborative Meeting between MyIPO and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent & Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   (YES) NO

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   (YES) NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

*Response to Question No. 3:*

Patents Act of Malaysia 1983 (Act 291), last amendment 2006 (Act A1264)

Section 11 – Patentable invention Section 12 – Meaning of invention
Section 13 – Non-patentable invention Section 14 – Novelty
Section 15 - Inventive Step

Patents Regulation 1986, last amendment 2011

Section 12 – Description

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   (YES) = The guidelines are publicly available in the both language(s).

   (NO (a)) = The guidelines are publicly available only in the English language.

   (NO (b)) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

YES NO

*Response to Question No. 5:*

The guideline is officially titled as "Patent Examination Manual 1985, last amendment 2011." Other than the 'manual,' there are no supplementary materials for the examiners to refer to.

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

YES = The guidelines have individual part(s) concerning:

*Delete the item(s) where not applicable* AI CS BM IoT

NO = The guidelines do not separately deal with such technologies.

*Response to Question No. 6:*

The current patent examination guideline (Manual 1985) has Chapter IV titled as "Patentability: Programs for Computers." The MyIPO is now intensively drafting the patent examination guidelines expressly focusing on AI, CS, BM and IoT under the scope of the computer-related inventions.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

N/A = The AI part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

N/A = The CS part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

N/A = The BM part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

N/A = The Iot part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games.

YES, as follows

*Response to Question No. 11:*

Currently, Computer Related Inventions (CRI) are covered by the guidelines related to Information and Communication Technologies.

The CRI thus involves inventions of computer programs, computer, computer networks or other programmable apparatus which are realized by means of program or programs. The CRI also involves invention that relates to a business and mathematical method.

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

YES | NO

IF NO, any intention to include such examples or the like in the future guidelines?

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, i.e., the invention is the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. When the Office receives the AI application, your Office makes it a rule to deal with such application in a particular technical area(s)/field(s).

    YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

*Technical area/field where the AI patent application is dealt with in response to Question No.14:*

Examiners from Component and Network Unit or Management & Information System Unit will conduct examination related to this AI patent applications.

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI application, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
    - ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

The MyIPO is currently in the process of reviewing the CRI guideline.
The review will include updating examples on a certain emerging technology and increasing readability of the guideline for better understanding by and usability for the patent examiners.

16. In the MyIPO-ERIA discussion on February 13, 2020, we would like to start the meeting with the following questions about the *status quo* of the AI applications in your country and their filing with your Office. Please get the following questions ready to be answered in the meeting, while any feedbacks or answers are always welcome and appreciated even before the meeting.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI/CS applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

Annual Number of Applications (referring to IPC G06N3 and G06N5)
in parenthesis: TOTAL: 26 applications

| | | | | |
|---|---|---|---|---|
| 2000 (1) | 2008 (4) | 2009 (1) | 2011 (1) | 2012 (1) |
| 2013 (2) | 2015 (2) | 2016 (4) | 2017 (6) | 2018 (1) |
| 2019 (2) | 2020 (so far 1) | | | |

All applications filed in years 2000-2016 have all been processed (grant, refuse or still in examination process).
Three (3) applications were filed by China, but not yet examined.

16-2. Number of the staff members in your Office who may deal with AI applications:

*Response to Question No. 16-2:*

9 examiners

16-3. Technical backgrounds of the participating patent examiners to the meeting:

*Response to Question No. 16-3:*

Computer Engineering

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

Yes

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

- Lack of AI knowledge base
- Unfamiliar technical field that AI application is embedded

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the three Case Examples presented by the JPO. Of course, any response from the MyIPO prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

**********

## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent
**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

17-2. If disagree, please explain your basis why this invention does NOT fall under the concept of eligible "invention."

*Response to Question No.17-1 and 17-2:*

**Disagree:**

Even though computer program does not fall under the non-patentable invention (Section 13), however, the claims of Case Example 1 do not satisfy the meaning of invention, because they do not have technical characters (Section 12(1)).

The trained model as explained in the claim is regarded as an abstract nature unlike a computer program (a mechanism which produces output as 'instructed'). A trained model does not comprise of instructions that a computer can carry out and causes the computer to carry out said calculation.

18. This invention specifies the following algorithms.
    (i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
    (ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
    (iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.

    The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
    The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

18-2. If disagree, please explain your basis why this invention does NOT fall under the category of a creation of the technical idea utilizing the laws of nature.

*Response to Question No.18-1 and 18-2:*

**Disagree:**

As explained in Response to Question 17, the MyIPO is currently of the opinion that the trained model as claimed in Case Example 1 is still an "abstract" idea, for it produces outputs after having learned data "by itself" it creates outputs "by its discretion," even if the trained model has reproducibility in its productions. We never know the reason or mechanism why the trained model would develop such an output.

The Office thus observes that there are no technical features involved in the trained model unlike other computer programs which specific functions are all "instructed." The Office also thinks the issue here may be only a matter of drafting the description to evaluate the invention as a whole.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

*Response to Question No.19-1:*

**Agree:**

There is no provision in the current Malaysian Patents Act that the CS invention is expressly excluded from the definition of the patentability. Especially the invention consists of mechanisms by collaboration between software and hardware resources.

However, if the claim(s) does not have technical characters, i.e., the claimed contribution of the CS invention is abstract or only an idea, it does not satisfy the definition of invention (Section 12(1)).

19-2. If disagree, please explain how CS invention is to be examined in your Office. Any guidelines or manuals specifically focus on the examination processes and procedures for CS invention, as the USPTO has?

*Response to Question No.19-2:*

Currently, the CRI Guideline is only available for internal reference.

While using it internally, the Office tries to improve its quality and usability involving more and more patent examiners and some of the lawyers and users. The MyIPO does its best efforts to 'finalize' the CRI Guideline, so that the guideline would be open to the public (even though making the guideline publicly available is not legislatively mandatory in Malaysia).

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
If so, please explain how your Office defines the business model inventions.

*Response to Question No.19-3:*

Method of doing business per se falls under non-patentable invention (Section 13(1)(c)). However, if the claimed invention comprises a technical character, the claims will be examined according to the CRI guideline.

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No.20-1:*

**Agree:**

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.21-1:*

**Agree:**

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.
    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.
    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree:**

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."

*Response to Question No.23 (1):*

The MyIPO practices the patent examination as the EPO exercises.

Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

*Response to Question No.23 (2):*

The MyIPO does not observe any non-technical feature in Case Example 2.

## CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
(i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
(ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
(iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**

The MyIPO observes that the claim is supported by the description, since the features of web advertisement data and mention data are clearly disclosed in the description. In this sense, the presumption, which a certain correlation between the data concerned is assumed as a premise for Case Example 3, is not such a major issue as the JPO highlighted above.

The Office further concludes that the description requirement is fulfilled even if the above-mentioned assumption has not been given in the case.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.25-1:*

**Agree:**

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.26-1:*

**Agree:**

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No.26-3:*

The MyIPO would find it difficult to explain how much the description should be supported by data and other supportive information, for it may indeed depend on cases.

The Office would however conduct the patent examination in accordance with the rules provided for in Patents Act of Malaysia and, specifically its Regulation Section 12 and 15.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

MM

# Topics of Discussions

**for Collaborative Meeting between Myanmar IP Department and ERIA to Discuss Patentability Requirements in View of Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent & Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Department are already available in a form of document (either on paper or electronically).

   YES  NO  IF NO to this question, please go to Question No.14.

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES  NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

| *Response to Question No. 3:* |
|---|
| |

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).

   NO (a) = The guidelines are publicly available only in the _____ language.

   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES  NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The AI part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The BM part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria: N/A

   Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    YES = The Iot part of the guideline has all patentability criteria as below:

    NO = Only the following criterion/criteria: N/A

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games. YES, as follows | N/A

    *Response to Question No. 11:*

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Department's patent examination.

    YES | NO IF NO, any intention to include such examples or the like in the future guidelines? YES | NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES | NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. **<Jumped from Question No.1, if applicable>** Even though your Department has not yet had the patent examination guidelines finalized in writing, the patent applications which Myanmar IP Department receives are to be dealt with in the following manner. Explain briefly how your Department would conduct patent examination in the Department.

*Methodologies in your Department how to in response to Question No.14:*

Myanmar Patent Law No. 7/2019 was promulgated on 12 March 2019, providing for a framework for the protection of inventions related to products and processes. However, the law has not yet been entered into force.

With the view to keep the law active and move into force, necessary steps are being taken for the realization of the procedure, rule, regulation, precept, ordinance, and norm.

Therefore, Myanmar IP Department does not start the relevant procedures for receiving and giving the patent examination to patent applications yet.

For your information, Myanmar IP Department currently and only receives so-called "old" trademark (*) applications for trademark registration.

(*) In this context, "old" refers to the trademark which was registered at Office of Registration of Deeds of Myanmar.
In addition, Myanmar IP Department currently receives the mark which is not registered at the Deeds and Documents Registration Office, but is nevertheless genuinely used within the Myanmar markets.

14-1. When the Department receives the AI application, your Department makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO

IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

IF NO, please tell us how your Department would handle AI applications.

*Response to Question No.14-1:*

As explained in Q14, Myanmar IP Department does not yet conduct the patent examination in the Office, not to mention of AI-related applications.

Prospecting the commencement of the patent examination in the future, the Department has keen interest and studies the procedures for the patent examination, including the one for emerging technologies like AI.

Based on our study and related policies of Myanmar, the Department would like to specify the detailed procedures for the future patent examination procedures in Myanmar.

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
    - ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

- With regard to the patent examination guidelines in general, Myanmar IP Department has a plan to establish them in due course of time after the implementation of Regulations for the Patent Law.
- However, the Department does not have concrete implementing steps toward the establishment of the patent examination guidelines focusing on AI-related inventions, for we think that there are lots of issues to be considered and learned in these emerging technologies.
- We had a legal advice on drafting regulations from JICA, and also requested JICA to review and redraft the examination part of the patent regulation.
- Concerning the emerging technologies, the Department is not familiar with such advanced technologies. Thus, we appreciate kind assistance from relevant parties, so that the Department effectively drafts the patent examination guidelines for such new technologies.

16. For forthcoming discussions with Myanmar IP Department (either by email or web-meeting), I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your Department.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Department has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

Nil.

16-2. Total number of the patent examiners in your Department and, among them, the number of examiners in your Department who may deal with AI applications:

*Response to Question No. 16-2:*

Now the Department has only four officials in in total in Patent Division. Their educational backgrounds are:
Electrical Power Engineering, Biotechnology Engineering, Manufacturing Engineering and Chemical Engineering.

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

*Response to Question No. 16-3:*

We have a plan to appoint some officials who have technical backgrounds on IT, Electronics and Mechatronic to deal with AI-related applications.

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

Nil.

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

In relation to the answer for Q14-1, Myanmar IP Department has a certain possibility, during the initial stage of implementing the IP regime in Myanmar, to outsource the patent substantive examination to other IP Office(s), if the related Myanmar's policies agree.

Presently, we have no experience in examining the AI applications. However, we may surely have to face some difficulties, such as the lack of knowledge on AI invention, limited human resources in the field of AI and unfamiliar technical field that AI application is embedded.

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the JPO's three Case Examples. We would be pleased if we conduct discussions either online or in writing through email exchanges based on your observations concerning the following Case Examples.

However, the following discussion topics are not meant to urge the Department to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Department to preview the points before we meet.

*General comments by the DIGP in responding to the following questions:*

**<NOTE> Myanmar IP Department would like to reserve its official judgements on the following questions concerning Case Examples, for the Department does not yet conduct substantive examination on patents.**

**The Department is however pleased to present some comments responding to some of the questions on Case Examples.**

**The following comments are made without prejudice to future changes possibly based on the upcoming examination guidelines.**

**********

## ■ CASE EXAMPLE 1: <u>Assessment of Eligibility of Patent</u>

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.17-1:*

**Agree:**

According to the article 14 (a)(iii) of the Myanmar Patent Law, computer program itself cannot be patentable. We presently assume the trained model is not itself a computer program. So, the trained model is eligible for an invention.

18. This invention specifies the following algorithms.
(i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
(ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
(iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.18-1:*

**Agree:**

We agree with the above-mentioned reasoning adopted by the JPO.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

*Response to Question No.19-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
If so, please explain how your Department defines the business model inventions.

*Response to Question No.19-3:*

According to the article 14 (a)(ii) of the Myanmar Patent Law, schemes, rules or methods for doing business, performing purely, mental acts or playing games cannot be patentable.

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No.20-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.21-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.

(i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.

The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree:**

The claim 2 of the invention has inventive step, because of using a temperature factor as an input parameter.

It is not a common general knowledge to those person skills in the art to use upstream temperature to estimate power generation and it has the effect of improving the estimation accuracy.

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Department gives the examination to the invention "with non-technical features."
Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
    (i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
    (ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
    (iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

    The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**
The Department agrees with the opinion and decision by the JPO.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.25-1:*

**Agree:**

The Department agrees with the opinion and decision by the JPO.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.26-1:*

**Agree:**

The Department considers that the JPO's observation seems to be in line with Myanmar's Patent Regulation, which is now drafted and under the process of finalizing. The draft Regulation provides for as follows:

The description shall start by stating the title of the invention, which shall be short and precise, and shall:

(a) specify the technical field to which the invention relates;

(b) indicate the background art which, as far as known to the applicant, can be regarded as useful for the understanding, searching and examination of the invention, and, where feasible, cite the documents reflecting such art;

(c) disclose the invention in such terms that it can be understood and, in a manner, sufficiently clear and complete for the invention to be evaluated and to be carried out by a person having ordinary skill in the art, and state its advantageous effects, if any, with reference to the background art;

(d) briefly describe the figures in the drawings, if any;

(e) pursuant to Section 22(a) of the Law, describe at least one best mode conceived by the applicant for carrying out the invention by the person having ordinary skill in the art; this shall be done in terms of examples, where appropriate, and with reference to the drawings, if any;

(f) indicate explicitly, when it is not obvious from the description or nature of the invention, the way in which the invention is industrially applicable and the way in which it can be made and used invention by the person having ordinary skill in the art, or, if it can only be used, the way in which it can be used.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Department requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No.26-3:*

**N/A:**

The Department considers that it depends on the invention of patent application which has to describe drawings, flowcharts, time charts or tables, if any.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

PH

# Topics of Discussions

**for Collaborative Meeting between IPOPHIL and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent &
Trademark Office on behalf of the ERIA

## TOPICS OF DISCUSSIONS:

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   (YES) NO

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   (YES) NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

*Response to Item No. 3:*

CHAPTER 2 of the IP Code of the Philippines or Republic Act 8293.
Section 21 Patentable Inventions
Section 22 Non-Patentable Inventions
Section 23 Novelty
Section 26 Inventive Step
Section 27 Industrial Applicability

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   (YES) = The guidelines are publicly available in the both language(s).

   (NO (a)) = The guidelines are publicly available only in the English language.

   (NO (b)) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

   YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

   YES = The guidelines have individual part(s) concerning:

   *Delete the item(s) where not applicable* AI CS BM IoT

   NO = The guidelines do not separately deal with such technologies.

7. IF YES to the item No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The AI part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria:

   Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to the item No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The CS part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria:

   Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to the item No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

   YES = The BM part of the guideline has all patentability criteria as below:

   NO = Only the following criterion/criteria:

   Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to the item No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    YES = The Iot part of the guideline has all patentability criteria as below:

    NO = Only the following criterion/criteria:

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to the item No.6 (no separated guidelines for the emerging technologies), or even YES to the item No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games.

    YES, as follows | N/A

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

    YES NO IF NO, any intention to include such examples or the like in the future guidelines?

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, i.e., the invention is the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

    YES NO

    For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. When the Office receives the AI application, your Office makes it a rule to deal with such application in a particular technical area(s)/field(s).

YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

*Technical area/field where the AI patent application is dealt with in response to Question No.14:*

Electrical and Electronics Examining Division (EEED) and/or
Information and Communications Technology Examining Division (ICED)

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI application, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies? Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
    - ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

We, in the Bureau of Patents, believe that every patent examination guideline must constantly adapt to the changing technological and patent examination landscape. Hence, there should always be a need to enhance the content of the patent examination guidelines, especially in specialized fields, to provide for a more decisive and precise patentability determination.

At the moment, the IPOPHL Examination Guidelines in examining Information Communication Technology and Computer Implemented Inventions needs to be updated to include more recent examples in determining patentability requirements.

We deemed it important to have separate discussions on patentability of patent applications with subject matters including AI, CS, BM and IoT in the manual of substantive examination practice. Examples should comprise many case samples dealing with specifically and separately with AI, CS, BM and IoT fields.

16. In the IPOPHIL-ERIA discussion on November 28, 2019, we would like to start the meeting with the following questions about the *status quo* of the AI applications in your country and their filing with your Office. Please get the following questions ready to be answered in the meeting, while any feedbacks or answers are always welcome and appreciated even before the meeting.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI/CS applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Item No. 16-1:*

15 received so far / 4 being examined (or finished examination)

16-2. Number of the staff members in your Office who may deal with AI applications:

*Response to Item No. 16-2:*

14 examiners (8 for EEED, 6 for ICED (see Question No.14))

16-3. Technical backgrounds of the participating patent examiners to the meeting:

*Response to Item No. 16-3:*

Electronics, Electrical, Computer, and Mechanical Engineering
Information Technology

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Item No. 16-4:*

As the applications related to AI continuously increase, we are making progress in examining AI applications. Likewise, our examiners are also gaining more expertise in the field by attending AI-related trainings.

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

Because AI patent applications, in most cases, involve both abstract and technical features, difficulty in determining patent eligibility is the most common concern for us. Aside from this, deciding on whether an AI application meets the full disclosure requirement likewise presents a challenge.

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the three Case Examples presented by the JPO. Of course, any response from the IPOPHIL prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

**********

## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent
**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

17-2. If disagree, please explain your basis why this invention does NOT fall under the concept of eligible "invention."

*Response to Question No.17-1 and 17-2 (1):*

**Disagree:**

Trained Model is directed to **computer algorithms** which fall under computer program per se under the IP Code.

**IP Code of the Philippines**

**Sec. 22**. Non-Patentable Inventions

The following shall be excluded from patent protection:

XXX 22.2. Schemes, rules and methods of performing mental acts, playing games or doing business, and **programs for computers** XXX.

Further, since a Trained Model is computer algorithm which is not concrete and tangible it does not fall under the categories of inventions (**product or process**) under the Section 21 of the IP Code.

**Sec. 21.** Patentable Inventions - Any technical solution of a problem in any field of human activity which is new, involves an inventive step and is industrially applicable shall be patentable. It may be, or **may relate to, a product, or process, or an improvement of any of the foregoing.** (Sec. 7, R.A. No.165a)

**Implementing Rules and Regulations on Inventions (IRR)**

**Rule 201.** *Statutory Classes of Patentable Inventions.* – A patentable invention may be or may relate to:

(a) A **product**, such as a machine, a device, an article of manufacture, a composition of matter, a microorganism;

(b) A **process**, such as a method of use, a method of manufacturing, a non-biological process, a microbiological process;

(c) XXX

Because a Trained Model does not fall within the definition of product or process in view of the IP Code, it is, therefore, not eligible for patent protection.

However, if the claim is redrafted such that the subject matter is directed to a product or process in view of the IP Code, the claim can be patentable.

**Example of Eligible Patent Claim (IP Code):**

A computer system programmed to output values of reputations of accommodations based on text data on reputations of accommodations by means of a trained model wherein:

the model is comprised of a first neural network and a second neural network connected in a way that the said second neural network receives output from the said first neural network;

*Response to Question No.17-1 and 17-2 (2):*

the said first neural network is comprised of an input layer to intermediate layers of a feature extraction neural network in which the number of neurons of at least one intermediate layer is smaller than the number of neurons of the input layer, the number of neurons of the input layer and the number of the output layer are the same, and weights were trained in a way each value input to the input layer and each corresponding value output from output layer become equal;

weights of the said second neural network were trained without changing the weights of the said first neural network; and

the model causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network.

18. This invention specifies the following algorithms.
(i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
(ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
(iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

18-2. If disagree, please explain your basis why this invention does NOT fall under the category of a creation of the technical idea utilizing the laws of nature.

*Response to Question No.18-1 and 18-2:*

(No.18-1) Agree on the premise that the specific information processing of analyzing hotel accommodation reputations, as embodied by the claim, involves software and hardware components wherein the software is concretely realized by hardware devices (i.e., input to the computer, weights calculation and final output).

(No.18-2) The IP Code of the Philippines, however, **disagree** with findings that the claim, **as drafted**, is patentable because a Trained Model is considered as computer software (algorithm) per se which is a non-statutory subject matter for patent.
However, if redrafted in a manner that the subject matter is directed to an invention falling under the product or process category, as aforementioned in item 17.2, the invention in Case 1 can be patentable subject matter under the IP Code of the Philippines.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

*Response to Question No.19-1 (1):*

**Agree:**

Under the IP Code of the Philippines, computer programs can be patentable subject matter for inventions if "further technical effect" is produced when the program is carried out by a computer. When software is concretely realized by using hardware resources said software is deemed to be exhibiting a "further technical effect". There invention should include tangible/concrete means whereby software and hardware are working cooperatively and evidently to solve/realize a technical problem which for example include manipulation of information or arithmetic operation.

However, a claim to a computer program should follow the format allowable provided in the ICT and CII Guidelines such as the following non-exhausted examples:

- A computer readable recording medium which records a program that makes a computer execute a process A, a process B, A process C...
- A computer readable recording medium which records a program that causes the computer to function as a means A, means B, means C...

*Response to Question No.19-1 (2):*

- A computer-readable medium which records a program that makes a computer implement a function A, a function B, a function C...
- A computer-readable recording medium which records a program that makes the computer carry out step A, step B, step C...

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?

If so, please explain how your Office defines the business model inventions.

*Response to Question No.19-3:*

**Non-Patentable Business Method**

Non-Patentable: IP Code and Implementing Rules and Regulations on Inventions (IRR)

Rule 201(d) **Method of doing business**, such as a method or system for transacting business **without the technical means for carrying out the method or system** (i.e., Claims for a method of doing business in abstract, i.e., not involving any technical means and considerations in carrying out the method)

"Business Method per se" may be construed to mean that subject matter is considered to be a mere abstract creation lacking in technical character therefore, no patentable invention.

**Example:**

Claim: A method of encouraging customers to be loyal buyers by giving a discount on future purchases.

- The subject-matter of the example claim defines purely a business method and does **not** have **technical character.**

**Patentable Business Method**

However, if an invention involves "Technical Character", wherein tangible components/devices and computer-related technical concepts are employed, the claim to a product or process, even if involves a Business Method/Concept, is considered eligible for patent protection.

**Example:**

A computer implemented method with a database of customers who have previously purchased goods for applying discounts to any subsequent purchases wherein the discounts are computed by the computer based on the amount and frequency of purchased.

- The claim cannot be considered business method per se because it includes tangible components/devices and computer related technical concepts (e.g., electronic database administration) wherein the computer software is concretely realized by means of hardware resources.

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No.20-1:*

**Agree:**

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.21-1:*

**Agree:**

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.
    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.
    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree:**

There is no teaching or evidence in the prior art about using temperature factor as input parameter to make estimation of dam power generating capacity more accurate.

23. If the answer to the Item No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."
    Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
    If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

*Response to Question No.23:*

We categorized the invention in terms of technical and non-technical features to determine whether it fulfills the eligibility requirement in terms of "technical character". If the invention involves only abstract/non-technical features, it will not be eligible for patent protection. On the contrary, if the invention involves both technical and non-technical features it is patentable subject matter.

For inventions involving both technical and non-technical features, we examine patentability requirements (i.e., Novelty and Inventive Step) of the claim as a whole and don't separate the non-technical and technical features.

**Novelty:** If the claimed invention and the prior art differ in either the non-technical or technical features the invention is considered novel.

**Inventive Step:** If the difference of the invention and prior art lies in the non-technical field (e.g. rules, data gathering schemes etc.) the invention is obvious because non-technical/abstract concepts are obvious to a skilled person. However, if the difference lies in the technical features, the invention as claimed might be patentable if the prior arts do not provide prima facie evidence of the differentiating feature.

Example: Case 2

**Novelty:** The invention involves both technical and non-technical features in which the subject matter of the invention differs from the prior art in that the subject invention includes using temperature factor as input parameter to make estimation more accurate. Therefore, the invention in Case 1 is novel over the prior art.

**Inventive Step:** Since temperature factor is a technical parameter that requires technical considerations/concepts to implement, the invention in case 2 has inventive step in view of the prior art because the difference is not suggested in the prior art and likewise involves the technical features of the claimed invention.

## CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
    (i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
    (ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
    (iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

    The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.25-1:*

**Agree:**

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.26-1:*

**Agree:**

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No.26-3:*

The IPOPHL patent examination guidelines do not any specific provisions pertaining to the inclusion flowcharts and tables. Flowcharts and tables are only necessary when there is a need to explain and illustrate the invention using such tools. For instance, if the invention sought for protection cannot be fully described without flowcharts and tables, the specification should include such tools including detailed explanation for same. If, however, the application can be disclosed fully, from the view point of a person skilled in the art, with the exclusion of flowcharts and tables it is also considered complete disclosure.

In other words, full disclosure/enablement determination lies not on the present or absence of flowcharts and tables but on whether the application passes the test of enabling disclosure prescribed by Rule 406 and Rule 406.1 of the Implementing Rules and Regulations.

**Rule 406.** *Test for Enabling Disclosure.* – The test for enabling disclosure is whether the person to whom it is addressed could, by following the directions therein, put the invention into practice.

**Rule 406.1.** *Enabling Disclosure.* – The enabling disclosure shall contain a clear and detailed description of at least one way of doing the invention using working examples. It shall contain a sufficient and clear disclosure of the technical features of the invention including the manner or process of making, performing, and using the same, leaving nothing to conjecture.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

SG

# Topics of Discussions

**for Collaborative Meeting between IPOS and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent
& Trademark Office on behalf of the ERIA

**TOPICS OF DISCUSSIONS:**

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically)

   YES NO

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

| *Response to Question No. 3:* |
| --- |
| Singapore Patents Act and Singapore Patents Rules |

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).
   NO (a) = The guidelines are publicly available only in the English language.
   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

YES NO

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

YES = The guidelines have individual part(s) concerning:

*Delete the item(s) where not applicable* AI CS BM IoT

NO = The guidelines do not separately deal with such emerging technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The AI part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The CS part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The BM part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

    YES = The Iot part of the guideline has all patentability criteria as below:

    NO = Only the following criterion/criteria: N/A

    Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

    Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games. YES, as follows

*Response to Question No. 11:*

"General" Examination Guidelines cover broad principles and guidance for examiners to carry out the examination in all technical fields.

Meanwhile, examiners are generally informed to understand the 'case-by-case' nature of determination for emerging technologies, since eligibility and inventive step for such cases tend to be fact specific.

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

    YES NO IF NO, any intention to include such examples or the like in the future guidelines? YES NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

YES NO N/A

For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. When the Office receives the AI application, your Office makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

*Technical area/field where the AI patent application is dealt with in response to Question No.14:*

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?
    - ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

The IPO's current "general" Examination Guidelines are sufficient for the applications in emerging technologies we examine in Singapore, and there are no immediate plans to enrich the Examination Guidelines for these specific purposes.

16. In the IPOS-ERIA discussions, I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your Department.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

*Information is not readily and publicly available at this moment.*

16-2. Total number of the patent examiners in your Department and, among them, the number of examiners in your office who may deal with AI applications:

*Response to Question No. 16-2:*

*Information is not readily and publicly available at this moment.*

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

*Response to Question No. 16-3:*

*Information is not readily and publicly available at this moment.*

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

Examiners need to continue to learn new AI technologies.

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

Examiners need to invest time and effort to continue to learn and understand new AI technologies.

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the JPO's three Case Examples. Of course, any response from the IPOS prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

**********

## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.17-1 (1):*

**Agree:**

The IPOS considers that the trained model defined in claim 1 of Case Example 1 is an invention.

*Response to Question No.17-1 (2):*

The actual contribution of the claimed subject matter lies in using two neural networks working together to generate a quantified value of reputation of accommodation based on text data. It does not fall within the excluded list specified in Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020). The actual contribution is technical in nature. Thus, it is considered to be patent eligible.

Paragraph 8.34 of Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020) provides that "claims to software that are characterized only by source code, and not by any technical features, is unlikely to be considered an invention on the basis that the actual contribution would be a mere presentation of information". The trained model defined in claim 1 of Case Example 1 is not "software that are characterized only by source code, and not by any technical features".

18. This invention specifies the following algorithms.
    (i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
    (ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
    (iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.

    The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
    The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.18-1:*

**Agree:**

The IPOS considers that the trained model defined in claim 1 of Case Example 1 is an invention.

The actual contribution of the claimed subject matter lies in using two neural networks working together to generate a quantified value of reputation of accommodation based on text data. It does not fall within subject matter not considered to be inventions specified in Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020) (see sub-sections i to v of Section A in Chapter 8). The actual contribution is technical in nature. Thus, it is considered to be patent eligible.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

19-2. If disagree, please explain how CS invention is to be examined in your Office. Any guidelines or manuals specifically focus on the examination processes and procedures for CS invention, as the USPTO has?

*Response to Question No.19-1 and 19-2:*

**Agreeable:**

The IPOS is agreeable to the JPO's analysis, although the Office sees some differences in our reasonings as follows:

Paragraph 8.6 of Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020) provides that "in considering the actual contribution of claims directed to computer-implemented inventions (CIIs), Examiners should determine the extent to which the computer (or other technical features) contributes to the invention defined in the claims. For such CIIs, it must be established that said computer (or other technical features), as defined in the claims, is integral to the invention in order for the actual contribution to comprise said computer (or technical features)".

Paragraph 8.5 of Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020) provides that "an objection should be raised if the actual contribution lies solely in subject matter that is not an "invention" (for example, if the actual contribution falls within any of the subject matter described in sub-sections i to v of Section A in Chapter 8)".

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
If so, please explain how your Office defines the business model inventions.

*Response to Question No.19-1 and 19-3:*

Paragraph 8.7 of Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020) provides that "claims relating to a computer-implemented business method would be considered an invention if the various technical features (e.g., servers, databases, user devices etc.) interact with the steps of the business method (i) to a material extent; and (ii) in such a manner as to address a specific problem.

As an example of what is meant by 'material extent', a claim may recite known hardware components for implementing a business method, but if the overall combination of the hardware provides, for example, a more secure environment for performing transactions, then the hardware would be regarded to interact with the business method to a material extent to address a specific problem.

The actual contribution, in this case, is likely to be the use of that combination of hardware for the business method, which would be considered an invention. However, if the technical features recited in the claim are such that they are no more than the workings of a standard operating system, in particular, the use of a generic computer or computer system to perform a pure business method, then such an interaction would not be considered to be a material extent and it is apparent that no specific problem is solved.

The actual contribution is likely to be the business method, and the claimed subject matter would not be considered an 'invention' by merely including the term 'computer-implemented' or a similar generic term in the claims."

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No.20:*

**Agree:**

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

21-2. If disagree, please explain the differences in determining the inventive step with regard to that invention.

*Response to Question No.21-1 and 21-2:*

**Disagree:**

Judging from the information provided on the JPO position, it seems the JPO generally assumes that machine learning is applicable in every context and would always be a natural choice for the skilled person to consider.
Although the IPOS is not yet fully familiar with the JPO's practice in this regard, the IPOS's analysis is mainly based on the information provided in the survey.

Claim 1 defines a system which estimates a hydroelectric power generating capacity of a dam using neural network.

The prior art discloses a system achieving the same objectives by a regression equation model without utilizing a machine learning.

The IPOS adopts the Windsurfing test (*Windsurfing International Inc. v Tabur Marine Ltd* [1985] RPC 59) to determine whether the claim is inventive.

The difference between claim 1 and the prior art is that claim 1 defines a system which estimates a hydroelectric power generating capacity of a dam using neural network rather than a regression model.

The question is whether the difference is obvious to the person skilled in the art.

Question 19 provides that "the cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning. The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art".

We think that the facts given in question 19 are not enough to determine whether it is obvious to the person skilled in the art to replace the regression model with the neural network. If the prior art and/or the common general knowledge of the skilled person does not suggest that it is advantageous to replace the regression model with neural network and neural network is not known to be used in the context of the invention, the person skilled in the art would not be motivated to do so. Therefore, claim 1 is inventive.

On the other hand, if the prior art and/or the common general knowledge suggests that it is advantageous to replace the regression model with neural network and neural network is commonly known to be used in the context of the invention, it is obvious to the person skilled in the art to replace the regression model with neural network in order to obtain the suggested advantage. Therefore, claim 1 is not inventive.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.
    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.
    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree:**

If there is no prior art disclosing that a temperature of the upper stream of the river would affect hydroelectric power generating capacity.

It is not obvious to the person skilled in the art to introduce a temperature of the upper stream of the river as input data into the neural network. Therefore, the claim is inventive.

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."
    Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
    If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

N/A

## ■ CASE EXAMPLE 3: Assessment of Description Requirements
**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
(i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
(ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
(iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.
The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.25-1:*

**Agree:**

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.26-1:*

**Agree:**

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No.26-3 (1):*

With respect to the requirement for the details of the description, Examination Guidelines for Patent Applications at the IPOS (Version: Mar 2020) has specified a general approach to determine the sufficiency of disclosure (Paragraphs 5.23-5.34).

We need to first identify the invention and what said invention claimed to enable the skilled person to do, and then ask whether the specification enabled him to do it. The specification must provide sufficient disclosure across the full scope of the claims.

If the claims themselves provide an enabling disclosure and are supported by the description, then this may be sufficient.

However, if the invention is unpredictable in nature, then more details may be required. Based on the disclosure in the specification, it is assessed whether said disclosure will impose an undue burden on the person skilled in the art to test all possible combinations to determine those that fall within the scope of the claims. If "yes", the disclosure is probably insufficient.

Our Examination Guidelines specifies that the specification does not need to disclose all the details required to work the invention if these would be known or obvious to the skilled person. The specification must disclose features that are essential to carry out the invention or provide sufficient detail for the skilled person to work the invention without needing to undertake further invention to do so.

*Response to Question No.26-3 (2):*

For this case, it is understood that examples are given in the description such as the web advertisement data, which is the number of times when the specific product publicly appeared on the web, and the reference data, which includes reviews on the product or advertisement in web articles, social media and blogs etc. Even though it is not explicitly mentioned about the correlation of the web advertisement data, the reference data and sales quantity, with the assumption that "a certain relation such as a correlation between advertisement data, reference data on the web and sales quantity" (cited from slides provided by JPO), the skilled person with common general knowledge would be able to work the invention after they read the specification.

Hence there is no enablement issue.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

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(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

TH

# Topics of Discussions

**for Collaborative Meeting between DIP and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent
& Trademark Office on behalf of the ERIA

**TOPICS OF DISCUSSIONS:**

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   YES  NO

2. IF YES to the above: The guideline provides for the major elements of "patentability," i. e. , patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   YES  NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

*Response to Question No. 3:*

All elements of "patentability" are based on the "Manual of Petty Patent and Patent Application Examination" published in 2019 (hereinafter referred to as "Manual 2019").

- Patent eligibility: Manual 2019, Chapter 1, Part 1, Item 2-4, 9-24
- Novelty: Manual 2019, Chapter 1, Part 3, Item 3
- Inventive step: Manual 2019, Chapter 1, Part 3, Item 3
- Description requirement: Manual 2019, Chapter 1, Part 1, Item 5-8

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).

   NO (a) = The guidelines are publicly available only in the Thai language.

   NO (b) = All guidelines are not yet publicly available.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

YES NO

6. The patent examination guidelines have separated parts or isolated explanations/ instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

YES = The guidelines have individual part(s) concerning:

*Delete the item(s) where not applicable* AI CS BM IoT

NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The AI part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The CS part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The BM part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The Iot part of the guideline has all patentability criteria as below:

NO = Only the following criterion/criteria: N/A

Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No. 6 (no separated guidelines for the emerging technologies), or even YES to Question No. 6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games.

YES, as follows

*Response to Question No. 11:*

The work processes in our office for the emerging technologies are almost the same as the methodologies of a general patent examination. However, we need to consider the eligibility of a patent in emerging technologies whether the patent is a CS-related invention.

Considering one of AI-related invention in DIP titled "SATELITE IMAGE CORRECTION METHOD AND APPARATUS USING NEURAL NETWORK," it seems like the techniques/method used in the invention, which is neural network to create the trained model for correcting satellite image.

Although DIP does not have concrete examination guidelines on AI application, DIP consider all AI applications as "computer related invention" which are dealt with guidelines in Manual 2019, Chapter 6.

Thus, in the views of scientific and mathematical theories and schemes, rules or methods of doing business, the invention has patentability because the invention describe clearly about how the invention cooperate between hardware and software.

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

YES NO IF NO, any intention to include such examples or the like in the future guidelines? YES NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, in other words, the invention is regarded as the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

YES NO

For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

*Any other comments or notes in response to Question No.13:*

Refer to Manual 2019, Chapter 6, Guideline of examiner, examiner need to focus on claim of invention involving computer related invention, data system for operating computer, computer program or business method, which is separated technical features from non-technical features.

This assessment has similarity to the methodological judgement of EPO. The DIP only judges the inventive step of an invention base on only technical features. The DIP would not consider part of non-technical features to judge inventive step.

14. When the Office receives the AI application, your Office makes it a rule to deal with such applications in a particular technical area(s)/field(s).

YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

*Technical area/field where the AI patent application is dealt with in response to Question No.14:*

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI invention, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines ( only if applicable)?
    - ✓ Any other messages?

*Any other comments or notes in response to Question No.15:*

The DIP has a plan to enrich the patent examination guidelines (also known as the "Manual of Petty Patent and Patent Application Examination"), so that the guidelines cover patent examination of AI and the other emerging technologies.

The DIP also plans to publish English version of the manual, but we don't have translator and budget.

The examiner of the DIP has lack of AI knowledge, we therefore take a longer time to complete examination of AI applications.

If the JPO provides training courses of AI technologies to the DIP, we will be grateful for Japan's support.

16. In the DIP-ERIA discussions, I would like to start clarifying the following questions about the *status quo* of the AI applications in your country and their filings with your Department.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

| Year | Number of AI/CS applications | | |
|---|---|---|---|
| | Chinese | Other | Total |
| 2006 | 0 | 1 | 1 |
| 2007 | 0 | 1 | 1 |
| 2008 | 0 | 2 | 2 |
| 2009 | 0 | 1 | 1 |
| 2011 | 1 | 1 | 2 |
| 2012 | 0 | 1 | 1 |
| 2013 | 0 | 3 | 3 |
| 2016 | 0 | 3 | 3 |
| 2017 | 0 | 4 | 4 |
| 2018 | 0 | 2 | 2 |
| 2019 | 0 | 5 | 5 |
| 2020 | 0 | 6 | 6 |
| 2021 | 0 | 1 | 1 |

Total summaries
= 32 applications

16-2. Total number of the patent examiners in your Department and, among them, the number of examiners in your office who may deal with AI applications:

*Response to Question No. 16-2:*

Total number of the patent examiners in the DIP is 102 people.
The number of examiners dealing with AI applications is 3 people.

16-3. Technical backgrounds of the patent examiners in charge of AI inventions:

*Response to Question No. 16-3:*

DIP has only three patent examiners in charge of AI inventions:

The first one graduated with the Doctor of Electrical Engineering, but he also has experience and knowledge about computer software.

The other graduate with Master of Data Science.

The last one graduate with Master of Computer Science.

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

One of the patent examiners graduated from a doctor's degree and in charge of AI inventions has worked in the DIP since 2017.

The other two examiners on AI who have expertise in both Data Science and Computer Science have worked for the office since 2019.

They all have experience in examining AI applications since then.

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

The DIP examiners in charge of AI inventions lack AI expertise and knowledge. The DIP's manual (examination guidelines) does not yet have enough details for examining AI-related patent applications.

The DIP also has no concrete ideas and know-hows to deal with AI inventions, the office thus takes a longer time to complete such examinations.

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the JPO's three Case Examples. Of course, any response from the DIP prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

**********

## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer `programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.17-1:*

**Agree:**

The trained model, which is considered as a computer programming, is created and discovered by human intervention to cause a computer to function the algorithm. Thus, the trained model is eligible for an invention.

18. This invention specifies the following algorithms.
(i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
(ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
(iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.
The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature (having technical features). Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."
The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.18:*

**Agree:**
The DIP agrees with the above-mentioned reasoning adopted by the JPO.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

*Response to Question No.19-1:*

**Agree:**
The DIP agrees with the above-mentioned reasoning adopted by the JPO.

The CS-related invention can be considered as an eligibility of a patent,
if the CS-related invention falls under one of the bullets below.

- a collaboration between software and hardware resources, or between software and devices.
- a special technical characteristic of the invention
- a concrete better effect and/or solution of the invention

19- 3. Are business-related inventions ( so called " business model invention" ) considered as being eligible for an "invention"?

If so, please explain how your Office defines the business model inventions.

*Response to Question No.19-3:*

The DIP considers that business- related inventions are not eligible for an invention as they do not provide a product or a process or a new way of doing something, or offer a new technical solution to a problem.

However, if the business model invention shows a special technical characteristic that provides a product or a process or a new way of doing something, the business model invention is eligible for an invention.

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

20-2. If disagree, please explain which categories a "system" invention falls under in your guidelines.

*Response to Question No.20-1 and 20-2:*

**Disagree:**

The DIP defines a "system" invention that is deemed as an invention which belongs to 'method' or 'process' category, which the 'method' or 'process' category means that method, process, or manufacturing procedure or maintaining or providing better quality or modification better for products and including procedure using.

In the other hand, 'products' or 'apparatuses' category in the DIP definition means that shape of products or elements of pattern or color of products, which have characteristics for products to enable using to be type for industry products including handicraft. In computer and software (CS) way, the "system" invention in the DIP definition means procedure, means, process, or any action to relate with computer.

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.
    (i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

    The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

    The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.21:*

**Agree:**
The DIP agrees with the above-mentioned reasoning adopted by the JPO.

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.

    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.22-1:*

**Agree:**
The DIP agrees with the above-mentioned reasoning adopted by the JPO.

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."

    Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?

    If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

*Response to Question No.23:*

The DIP considers the examination to the invention by splitting into 2 parts between the invention "with technical features" and the invention "non-technical features", but the DIP considers only the invention "technical features" for an inventive step.

For Case Example 2, there are no elements in invention claims be regarded as the invention with non-technical features.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*

*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:

(i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,

(ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,

(iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.

The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.24-1:*

**Agree:**

The DIP agrees with the above-mentioned reasoning adopted by the JPO.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.25:*

**Agree:**
The DIP agrees with the above-mentioned reasoning adopted by the JPO.

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.26-1 and 26-2:*

**Agree:**
The DIP agrees with the above-mentioned reasoning adopted by the JPO.

26- 3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No.26-3:*

Although the title of application explicitly named as an apparatus, the DIP concludes an invention as a system comprising multiple processes and methods without concrete hardware.

Furthermore, claim 1 of the said application is too broad and explains only overview concepts of the machine learning model. Consequently, the DIP justifies that the application is unpatentable refer to Section 9(3) Suggestion Applicants should specifically detail special technical features.
In this case, they should explain more about how to set up the model and hyperparameters. Besides that, they should completely describe all features in training datasets, the timeframe of data collecting, and advertising channels. They should give an example of datasets in a tabular form, and attach some flowcharts to describe sequent of the model.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:
(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),
(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

VN

# Topics of Discussions

**for Collaborative Meeting between IP Viet Nam and ERIA**
**to Discuss Patentability Requirements in View of**
**Patent Examination Cases Examples on AI-related Patent Application**

Prepared by Shobayashi International Patent &
Trademark Office on behalf of the ERIA

**TOPICS OF DISCUSSIONS:**

*To answer the following questions, please **delete an inapplicable answer or the item which, you believe, you do not agree with** (electronically on Microsoft Word).*

1. The patent examination guidelines of your Office are already available in a form of document (either on paper or electronically).

   (YES) NO

2. IF YES to the above: The guideline provides for the major elements of "patentability," i.e., patent eligibility, novelty, inventive step and description requirements, as mentioned in Aspect 2[i].

   (YES) NO

3. IF YES to the above: The following IP laws or regulations (rules) are the grounds for the said four elements of "patentability," i.e., the bases of the guidelines.
   IF NO to the above: The following is the reasons why IP laws or regulations do not necessarily cover all elements of "patentability."

*Response to Question No. 3:*

Law on Intellectual Property (No. 50/2005/QH11), amended by Law on amending and supplementing a number of articles of the Law on Intellectual Property (No. 36/2009/QH12).

4. The patent examination guidelines are publicly available *not only* in the local language(s) but in English as well.

   YES = The guidelines are publicly available in the both language(s).
   (NO (a)) = The guidelines are publicly available only in the Vietnamese language.
   NO (b) = All guidelines are not yet publicly available.

   <Note by IP Viet Nam> Due to the budgetary constraints, it is not yet feasible to have the Vietnamese guideline translated into English.

5. In addition to the 'official' patent examination guidelines, working manuals, handbook or the like are also prepared and shared among the patent examiners for facilitating the examiners' daily examining operations.

YES (NO)

*Response to Question No. 5:*

The guideline is currently used as a daily operation manual or handbook. IP Viet Nam however realizes the importance of updating the present 10-year-old guideline for the quality control for and improvement of transparency in the patent examination.

6. The patent examination guidelines have separated parts or isolated explanations/instructions concerning the emerging technologies, in particular, the Information and Communication Technologies (ICT) such as computer software (CS), artificial intelligence (AI), business model (BM) or internet of thigs (IoT).

(YES) = The guidelines have individual part(s) concerning:

*Delete the item(s) where not applicable* AI (CS) BM IoT

NO = The guidelines do not separately deal with such technologies.

7. IF YES to Question No.6 and the guideline has a separate **AI part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

[N/A] = The AI part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

8. IF YES to Question No.6 and the guideline has a separate **CS part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

YES = The CS part of the guideline has all patentability criteria as below.

(NO) = Only the following criterion/criteria:

[Eligibility] | Novelty and Inventive Step | Description Requirements

<Note by IP Viet Nam> The latter two criteria, i.e., Novelty/Inventive Step and Description Requirements concerning the CS inventions are covered by the general patent examination guidelines.

9. IF YES to Question No.6 and the guideline has a separate **BM part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

N/A = The BM part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

10. IF YES to Question No.6 and the guideline has a separate **IoT part**, that part includes all kinds of "patentability" criteria (see the said Aspect 2[i]) to externalize the particular ideas of the patentability for such technology.

N/A = The Iot part of the guideline has all patentability criteria as below:

= Only the following criterion/criteria:

Eligibility | Novelty and Inventive Step | Description Requirements

11. IF NO to Question No.6 (no separated guidelines for the emerging technologies), or even YES to Question No.6 concerning a partial coverage of such technologies in your guidelines, please elaborate methodologies or work processes for the patent examiners to conduct the patent examination for such technologies in the office.

Having considered the ERIA's three Case Examples, please take an example of hypothetical examination on an AI application in the views of (a) scientific and mathematical theories and (b) schemes, rules or methods of doing business, performing purely mental acts or playing games.

YES, as follows

*Response to Question No. 11:*

In most cases, the patent examination on the emerging technologies is carried out in team collaboration among patent examiners.

Thus, with regard the emerging technologies, inter alia, AI, BM or IoT inventions, decisions by the team and oral instructions shared in the team prevail and direct how to conduct the patent examination of such technologies.

12. Your patent examination guidelines for the emerging technologies, if any, have concrete examples or case studies for easy-to-understand and efficient operations of the Office's patent examination.

YES NO

IF NO, any intention to include such examples or the like in the future guidelines? YES NO

13. Under your guidelines, like the methodology used by the EPO (see below), a purported invention needs to be assessed whether it contains a basis of "technical features" in the invention, i.e., the invention is the one with or without non-technical features (such as performing purely mental acts or paying games, rules or methods of doing business or the like). This assessment is of importance to judge both the eligibility or inventive step of the invention.

YES NO

For your reference, the European Patent Office (EPO) considers that the assessment of "technical features" has vital importance to judge the eligibility and inventive step of an invention. The EPO would not take into account of the technical differences between the invention and prior art where such differences are only related to "non-technical features."

14. When the Office receives the AI application, your Office makes it a rule to deal with such application in a particular technical area(s)/field(s).

YES NO IF YES, please specify below the relevant technical area(s) or field(s) for the AI application.

*Technical area/field where the AI patent application is dealt with in response to Question No.14:*

Computer and information technologies (Electronic and Communication Division)

15. Please let us know your comments, if any, concerning the patent examination guidelines in general for the AI application, in particular, the following points.
    - ✓ Any plan to enrich the patent examination guidelines? Or any plan to newly establish the guidelines addressing the emerging technologies?
      Any assistance to seek?
    - ✓ Any foreseeable improvements you would make to the present guidelines?
    - ✓ Any concerns or hurdles, you feel, to deal with the examination on the emerging technologies?
    - ✓ Any reasons for not promulgate English version of the guidelines (only if applicable)?

*Any other comments or notes in response to Question No.15 (1):*

In 2020, IP Viet Nam plans to enrich the patent examination guideline in order to improve the quality of patent examination itself and also the consistency of the examination among patent examiners.

*Any other comments or notes in response to Question No.15 (2):*

The improvements should be made by including more examples to make the guideline more easy-to-understand for examiners especially in the fields of the emerging technologies.

To deal with the examination on the emerging technologies, one of the most important concerns is how to update the technology knowledgebase for patent examiners and to accumulate it for better Office performances. Currently, patent examiners are individually encouraged to have discussions with inventors of such emerging technologies during the process of the examination.

The assistance of other Offices like JPO in terms of sharing examination practices and technology explanations would be very valuable.

16. In the IP Viet Nam-ERIA discussion on February 11, 2020, we would like to start the meeting with the following questions about the *status quo* of the AI applications in your country and their filing with your Office. Please get the following questions ready to be answered in the meeting, while any feedbacks or answers are always welcome and appreciated even before the meeting.

16-1. Number of the AI/CS applications received so far (or by year) and the number of such applications that the Office has (had) started the examination:

If applicable, please specify the number of AI/CS applications filed by Chinese applicant(s) among them. Round or approximate numbers will do.

For your reference to your statistics, in the International Patent Classification (IPC), neural network models belong to "G06N3", knowledge-based methods belong to "G06N5" and the general classification for 'machine learning', which is synonymous with AI, is "G06N20."

*Response to Question No. 16-1:*

Number of applications received so far:
G06N3: Four (4), G06N5: One (1), G06N20: One (1)

** None of them filed by Chinese applicants.
Three (3) applications were filed by the Vietnamese applicants in 2019.

16-2. Number of the staff members in your Office who may deal with AI applications:

*Response to Question No. 16-2:*

Eight (8)

16-3. Technical backgrounds of the participating patent examiners to the meeting:

*Response to Question No. 16-3:*

Telecommunication, Computer and Information technologies

16-4. Any experience in examining AI applications by the participating examiners:

*Response to Question No. 16-4:*

Some of them have an experience in examining AI applications for example in the field of language processing

16-5. Elaborate the experience or any difficulties you had to overcome (or you are going through) when examining the AI applications:

*In response to Question No.16-5, please share your experience in the light of, for example, a team collaboration in conducting AI-related examination, lack of AI knowledge base, unfamiliar technical field that AI application is embedded:*

The followings are the major difficulties when examining the AI applications:

- Lack of AI knowledge base
- Unfamiliar technical field that AI application is embedded

**Topics of Discussions for Case Examples 1-3:**

The attention should now be drawn to **Aspect 2**[i] of our discussion mentioned on the first page of this document, i.e., the main purpose of conducting the meeting.

The following questions are merely to give our meeting food for thought in exploring the three Case Examples presented by the JPO. Of course, any response from IP Viet Nam prior to the meeting is highly appreciated, so that the ERIA participants would be able to make themselves ready even before the discussion in the face.

However, the following discussion topics are not meant to urge the Office to share the responses or answers immediately among us. Instead, please bear in mind the following viewpoints for efficient discussions in the meeting. If possible, please have an internal discussion in the Office to preview the points before we meet.

**********

## ■ CASE EXAMPLE 1: Assessment of Eligibility of Patent

**"Trained Model for Analyzing Reputations of Accommodations"**

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e., it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*

17. This invention relates to a trained model. In this regard, the JPO recognizes the trained model as a computer 'programming,' because the trained model triggers the activation of a function for the computer algorithm. The JPO would therefore conclude that the trained model is "eligible for an invention" and thus should be substantively examined.

17-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No.17-1 (1):*

**Agreeable:**

IP Viet Nam would however find it difficult to rationally conclude that a trained model is patent-eligible or not. The patent examination on AI-related technologies is in reality conducted on a case-by-case basis.

*Response to Question No.17-1 (2):*

The followings are the points to be considered to judge the eligibility of the AI trained model.

1. In general, EPO practices are followed in the patent examination.
2. The "computer program" is expressly stipulated as a non-patentable subject matter in Law of Intellectual Property (Article 52(2)) and the patent examination guideline (Chapter 2, 5.8.2.5), and is considered as a part of 'formality' issue before the substantive patent examination.
3. Computer programs are instead supposed to be protected by copyright under Article 22 of Law on Intellectual Property (see Question No.3 above).
4. Even though the neural network and trained model appear to be "product" without a hardware attached, they do not exactly fall under the category of "program." The concept of "program" is somewhat different from those used in the AI-related technologies.
5. Despite the facts mentioned above and having observed the present practice and tendency of the patent examination, so-called 'claim as a whole' approach should possibly be applied to the examination on such emerging technologies where concrete examination methodologies are not yet established.

IP Viet Nam feels that it needs more specific information concerning the Case Example 1 in order to observe how the subject matter would contribute to the technical effect comprehensively.

Further discussions are needed to see what exactly is excluded from the eligible patents, i.e., "computer program" or de facto "computer program per se." IP Viet Nam may examine the substance of the invention as a whole. Information given in Case Example 1 is insufficient for it.

18. This invention specifies the following algorithms.
(i) INPUT LAYER: appearance frequency of specific words obtained from the text data concerning reputations of hotel accommodations,
(ii) OUTPUT LAYER: quantified values of reputations of the hotel accommodations,
(iii) ALGORITHM: applying a weighting coefficient to the input value using two neural networks and obtaining an output value.

The JPO regards that the trained model is a creation of the technical idea utilizing the laws of nature. Thus, it falls under an "invention," even though the invention on its surface is a kind of a learning "model."

The reasoning behind this is that specific information processing with regard to the analysis of hotel accommodation reputations is concretely realized by the processing steps collaborating between software and hardware resources, i.e., input to the computer, weights calculation and the final output.

18-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No. 18-1:*

As in the situation explained in Response to Question No. 17, IP Viet Nam considers that it should require more information to evaluate the eligibility of the trained model.

The Office may need to observe the technical effects and preciseness of outcoming results derived from the trained model.

19. Regarding "computer software related invention" (hereinafter referred to as "CS invention"), the JPO regards it as an "invention" which utilizes the laws of nature, as explained above, if such an invention consists of concrete mechanisms realizing the collaboration between software and hardware resources.

19-1. Agree or disagree with the above-mentioned criteria to observe the eligibility of the purported CS invention employed by the JPO?

19-2. If disagree, please explain how CS invention is to be examined in your Office. Any guidelines or manuals specifically focus on the examination processes and procedures for CS invention, as the USPTO has?

19-3. Are business-related inventions (so called "business model invention") considered as being eligible for an "invention"?
If so, please explain how your Office defines the business model inventions.

*Response to Question No. 19:*

IP Viet Nam wishes to take more time to contemplate the issue and to explore more in detail how to assess the eligibility of AI-related inventions/trained models. The Office considers the following viewpoints are the touchstone of this assessment.

- ✓ Expression used in the claim: formality examination
- ✓ If the subject matter is a product or process
- ✓ If the subject matter involves technical effects or technical characters
- ✓ Technical problems which the subject matter intends to solve

## ■ CASE EXAMPLE 2: Assessment of Inventive Step

**"Estimation of Hydroelectric Generating Capacity"**

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e., whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*

20. This invention: 'an estimation system of a hydroelectric power generating capacity of a dam' relates to a "system." The JPO defines that a "system" invention is deemed as an invention which belongs to 'products' or 'apparatuses' category.

20-1. Agree or disagree with the above-mentioned claim interpretation by the JPO?

*Response to Question No. 20-1:*

**Agree:**

Even though the Claim 1 defines the invention is a "system," the Office considers that the invention as a whole should be categorized as a product or apparatus invention as a matter of formality examination.

21. The claim 1 depicts an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input and output data.

(i) INPUT LAYER: a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water flow rate into a dam during a predetermined period,

(ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.

The cited invention 1 achieves the same objectives by a regression equation model without utilizing a machine learning.

The JPO concludes that the claim 1 of the invention in question does not have an inventive step, for a machine learning is considered as well-known art.

21-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No. 21-1:*

**Agree:**

22. The claim 2 outlines an invention of a system which estimates a hydroelectric power generating capacity of a dam. And it is realized by the neural network having the following layers as a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data.
    (i) INPUT LAYER: relevant data such as a water inflow rate into a dam in the future based on a previous precipitation amount and additionally the temperature of the upper stream of the river, a water flow rate of the upper stream of the river and the like,
    (ii) OUTPUT LAYER: a hydroelectric power generating capacity in the future after the reference time.
    The attention should be drawn to the difference between the claims 1 and 2, i.e., an additional input parameter of the temperature of the upper river stream.
    The JPO is of the opinion that the claim 2 of the invention has an inventive step, for the claim 2 does use a temperature factor as an input parameter.

22-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No. 22-1:*

**Agree:**

23. If the answer to Question No. 13 is YES (i.e., the invention or its parts firstly needs to be categorized either an invention with non-technical features or one without non-technical features), please explain how your Office gives the examination to the invention "with non-technical features."
    Do you observe that certain aspects of Case Example 2 have some elements which should be regarded as the invention with non-technical features?
    If so, do you apply different criteria to such inventions when examining it, as the EPO 'ignores' non-technical features in conducting the examination.

*Response to Question No. 23:*

**No**, IP Viet Nam observes that the elements with regard to Case Example 2 are all "technical features," since input data explained in the Case are technical parameters.

## ■ CASE EXAMPLE 3: Assessment of Description Requirements

**"Business Plan Design Apparatus"**

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*
*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e., an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

24. This invention is comprised of the following means:
(i) ESTIMATION MODEL: an estimate model that has been trained through machine learning with a training data containing a web advertisement data and mention data (product evaluation found on web advertisement or the like) of a similar product that has been sold in the past and a sales quantity of the similar product,
(ii) SIMULATION: prediction of sales quantity based on a training data containing a web advertisement data and mention data,
(iii) PRODUCTION PLAN: a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the projected output sales quantity.
The JPO concludes that, in view of a common general technical knowledge, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a "correlation or the like" in this Case Example) between the advertisement data and reference data on the web and the sales quantity, even though the correlation or the like is not explicitly indicated in the description.

24-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No. 24-1:*

**Agreeable:**

IP Viet Nam considers that, based on the given assumption which a certain relation is already established in the Case, a person skilled in the art can presume such a correlation between the advertisement data and web reference data or sales quantity.

However, but for the above-mentioned presupposition, the Office has a strong feeling that the Office should invite the applicant and require concrete reasonings to show the correlation between the two factors.

25. The JPO considers that it would be practically feasible to produce an apparatus which designs and proposes business plans. The Office further believes that the apparatus utilizes the estimation model which enables the said input data to generate the output data, since it is conventionally known that the machine learning does realize the estimation model.

25-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No. 25-1:*

**Agree:**

26. The JPO justifies the enablement requirement of the invention by observing two factors, i.e., (i) the invention should be reproduced by a person skilled in the art (how-to-make), and (ii) the invention should be carried out (how-to-use).

26-1. Agree or disagree with the above-mentioned reasoning adopted by the JPO?

*Response to Question No. 26-1:*

**Agree:**

Even though the CS guideline does not have any enablement requirement, the general patent guideline does explain "how to make" or "how to use" type of requirements as a rule of drafting descriptions for the invention to be carried out.

The expressions in the guideline are that the description should be "concise" and has enough information, so that a person skilled in the art "can do" the invention.

26-3. The enablement requirement would directly relate to the description requirement. The enablement requirement should even be debatable, where the invention falls under category of computer and software (CS).
Please explain how much (or how deeply) your Office requires the applicant to furnish the description with concrete data or supportive explanations, such as a flowchart, a time chart or a table and so forth.

*Response to Question No. 26-3:*

It is presently emphasized and agreed that the description requirement should be justified on a case-by-case basis. It is because the applicant can or may use the most suitable means, such as a flowchart, table or even some source codes, to explain and support the matters in the description.

However, IP Viet Nam has a plan to amend the current guidelines to make the requirement clearer for CS invention, so that the Office can assert itself and see if the application meets the enablement requirement or not.

[i] The ERIA discussions are configured by two aspects and three layers:

**Aspect 1**: Finding out the basic structures and conditions with regard to the patent examination guidelines of an ASEAN IP Office, inter alia the assessment of the "patentability" of an invention. Although outlining the scope of "patentability" is not exactly the same in each country, we should observe how some of the elements i.e., patent eligibility, novelty and inventive step, are stipulated in the patent examination guidelines.

**Aspect 2**: Conducting studies on the three Case Examples prepared by the JPO, and concluding the studies by deciding whether or not the inventions concerned are considered as "patentable" respectively.

In deciding the patentability of these three Examples, it should be focused on the following three criteria to judge their patentability:

(i) Eligibility of patent (in other words, judicial exceptions, statutory subject matter, definition of invention or non-patentable invention),

(ii) Novelty and Inventive step and (iii) Requirements for description.

**Layer 1**: Case Example 1 for assessment of "eligibility for patent." This Case Example particularly focuses on the judgement concerning what would constitute an "invention."

The title of the Case Example is "Trained Model for Analyzing Reputations of Accommodations."

**Layer 2**: Case Example 2 for assessment of "inventive step." And this particularly focuses on the assessment whether or not the claimed invention fulfills the inventive step requirement.

The title of the Case Example is "Estimation System of Hydroelectric Generating Capacity."

**Layer 3**: Case Example 3 for assessment of "description requirements." This Case Example would disclose the requirements how the description and claims should be described.

The title of the Case Example is "Business Plan Design Apparatus."

**ERIA Research Project:**
**ASEAN Counterparts for Patent Examination Guidelines**
**on AI-related Inventions (as of June 1, 2021)**

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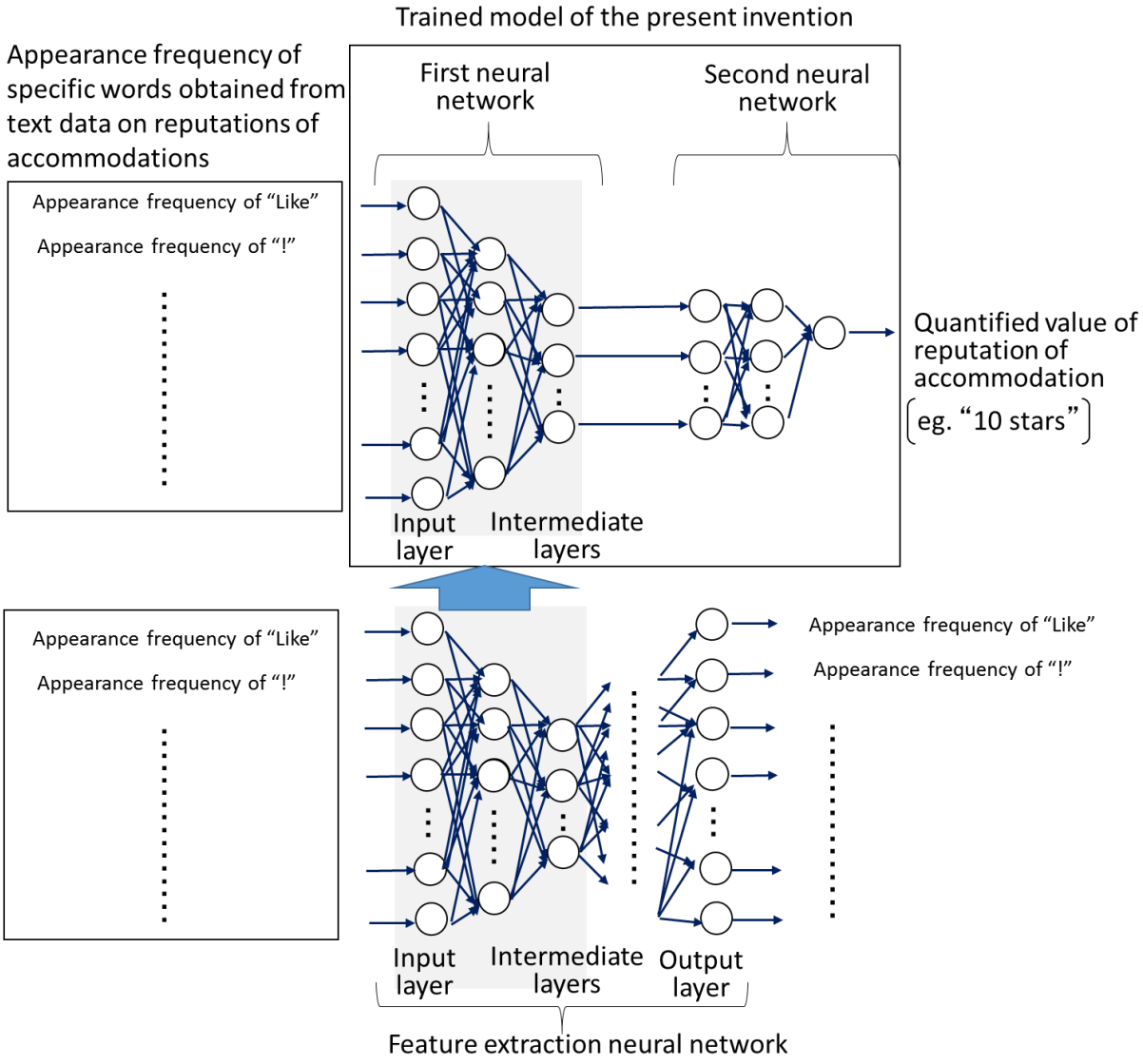
Case study of the 3 case examples
under the Patent Act in Japan

**[Case example 1]**
**<assessment of Eligibility for Patent>**
Trained Model for Analyzing Reputations of Accommodations

What is claimed is:

| | |
|---|---|
| [Claim 1]<br>A trained model for causing a computer to function to output quantified values of reputations of accommodations based on text data on reputations of accommodations, wherein;<br>the model is comprised of a first neural network and a second neural network connected in a way that the said second neural network receives output from the said first neural network;<br>the said first neural network is comprised of an input layer to intermediate layers of a feature extraction neural network in which the number of neurons of at least one intermediate layer is smaller than the number of neurons of the input layer, the number of neurons of the input layer and the number of the output layer are the same, and weights were trained in a way each value input to the input layer and each corresponding value output from output layer become equal;<br>weights of the said second neural network were trained without changing the weights of the said first neural network; and<br>the model causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network. | [Claim 1]<br>Falls under "invention."<br>(Falls under "invention" as a "program," even though the claimed subject matter is described as a "trained model.") |

Drawing




Overview of the description

[Background Art]

A neural network, which has a computer function as a computing unit to calculate output in response to certain input, is capable of performing complicated information processing at high speed by being trained from a number of actual examples. Therefore, people intend to use neural networks for various purposes in such fields as image recognition, voice recognition, voice synthesis and automated translation.

Generally, in cases where neural networks are utilized in new areas, in many cases it is not clear what should be input as the input feature values, therefore, it is necessary to carefully review what should be selected as the input feature values accordingly.

In order to analyze text data on reputations of accommodations such as hotels posted on travel review sites with neural networks, it is not straightforward to select the

input feature values, because the appearance frequencies of a variety of words ("Like", "!", etc.) included in the text data can be considered as the candidate input feature values.

[Problems to be solved by the invention]

The present invention has been conceived in view of the above problems into consideration and aims to accurately analyze reputations of accommodations even if the input feature values are not properly pre-selected.

[Solution for the Problem to be solved]

The trained model of the present invention aims to cause a computer to function to output quantified values of reputations of accommodations based on text data on reputations of accommodations and is comprised of a first neural network and a second neural network connected in a way that the second neural network receives output from the first neural network. The trained model is supposed to be utilized as a program module which constitutes a part of artificial intelligence software.

The trained model of the present invention is utilized in a computer equipped with a CPU and a memory. Specifically, the CPU of the computer operates, in accordance with instructions from the trained model stored in the memory, in a way that it performs a calculation based on trained weights and response functions in the first and second neural networks in response to data input to input layers of the first neural network (appearance frequency of specific words obtained from text data of reputations of accommodations, e.g. by performing morphological analyses) and outputs results from output layers of the second neural network (quantified values of reputations, e.g. "10 stars").

The first neural network is comprised of an input layer to intermediate layers of a feature extraction neural network. This feature extraction neural network is generally called autoencoder. In this network, the number of neurons in the intermediate layers is smaller than the number of neurons in the input layer. The number of neurons in the input layer and the number of neurons in the output layers are set to be equal. Moreover, a response function of each of the neurons in the input and output layers is a linear function, and other response functions of each of the neurons are sigmoid functions (1/(1+exp(-x))).

The feature extraction neural network is trained by means of a well-known art called back propagation method and weights between neurons are updated. In the embodiment of present invention, this neural network is trained to minimize mean square errors for overall input data so that data (each appearance frequency of a plurality of words obtained from text data on reputations of accommodations by performing morphological analyses) is input in the input layers and data the same as this input data is output from the output layers. Since sigmoid functions which are non-linear functions are utilized as neuron’s response functions as explained earlier, the weights between neurons are not symmetrical across the intermediate layer. As the feature extraction neural network is trained, the intermediate layer become possible to obtain the feature

values indicating characteristics of each input data. Although the feature values that appear in the intermediate layer do not necessarily have clear physical implication, those feature values are considered as what were compressed to the extent that information input to the input layer can be restored to information output from the output layer and the feature values that appear in the intermediate layer become almost similar regardless of the input feature values to the input layer. Therefore, it is not necessary to properly preselect the input feature values to the input layer any more.

In the present invention, the part from the input layer to the intermediate layers in the feature extraction neural network in which weights were trained is connected to the second neural network as the first neural network. Weights of the second neural network are trained without changing weights of the said first neural network. The training is performed by a well-known art called a back propagation method as explained earlier.

Since the trained model of the present invention is comprised of the above first and second neural networks, it can accurately analyze reputations of accommodations without presetting the feature values.

[Conclusion]

The inventions of claim 1 falls under "invention."

[Explanation]

- Claim 1

The trained model of Claim 1 is what "causes a computer to function to output quantified values of reputations of accommodations based on to text data on reputations of accommodations" as well as to what "causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network." Moreover, considering the descriptions which states that "the trained model is supposed to be utilized as a program module which constitutes a part of artificial intelligence software" and "the CPU of the computer operates, in accordance with instructions from the trained model stored in the memory, in a way that it performs a calculation based on trained weights and response functions in the first and second neural networks in response to data input to input layers of the first neural network (appearance frequency of specific words obtained from text data of reputations of accommodations, e.g. by performing morphological analyses) and outputs results from output layers of the second neural network (quantified values of reputations, e.g. "10 stars")", it is clear that the trained model of Claim 1 is a "program" even though the claimed subject matter of Claim 1 is

described as a "model."

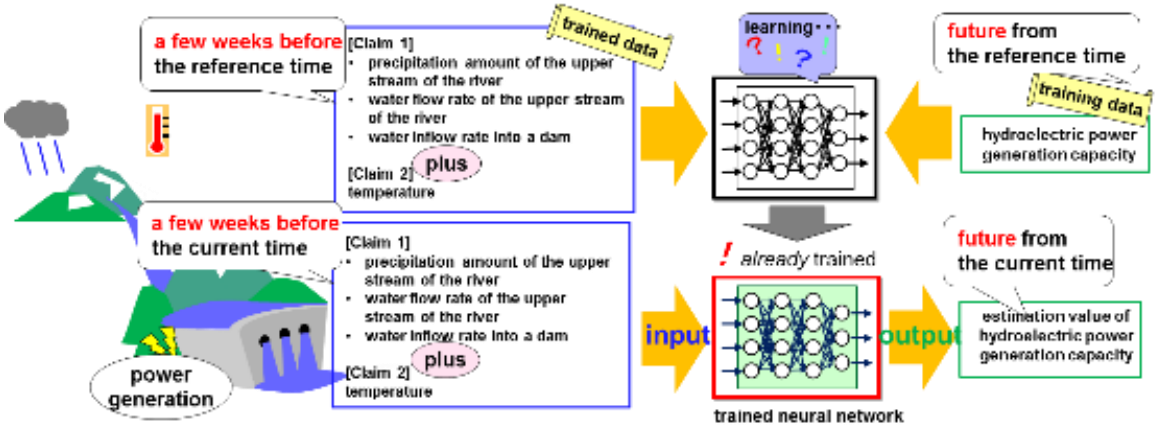
Moreover, it is determined, from the statement of Claim 1, that specific calculation or processing of specific information depending on the intended use which is accurate analysis of reputations of accommodations, is implemented by concrete means or procedures on which software and hardware resources cooperate, which is for a computer to "function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network." For this reason, in the trained model of Claim 1, a specific information processing system depending on intended use is constructed through cooperation of software and hardware resources.

Therefore, since the information processing by the software is concretely realized by using hardware resources, the trained model of Claim 1 is a creation of the technical idea utilizing the laws of nature and thus falls under "invention."

**[Case example 2]**

**<assessment of Inventive Step>**

Estimation system of hydroelectric generating capacity




What is claimed is:

[Claim 1]

An estimation system of a hydroelectric power generating capacity of a dam comprising:

a neural network that is built by means of an information processor, the neural network having an input layer and an output layer, in which an input data to the input layer containing a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water inflow rate into a dam during a predetermined period between a reference time and a predetermined time before the reference time, and an output data from the output layer containing a hydroelectric power generating capacity in the future after the reference time;

a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data; and

an estimation unit that inputs the input data to the neural network that has been trained by the machine learning unit with setting a current time as the reference time, and then calculates an estimated value of a future hydroelectric power generating capacity based on the output data of which reference time is the current time.

[Claim 2]

The estimation system of a hydroelectric power generating capacity as in Claim 1, wherein the input data to the input layer further contains a temperature of the upper stream of the river during the predetermined period between the reference time and the predetermined time before the reference time.

Overview of the description

[Background Art]

A hydroelectric power generating capacity in the future is estimated by a dam operator by estimating a water inflow rate into a dam in the future based on a previous

precipitation amount of the upper stream of the river, a water flow rate of the upper stream of the river and the like, and then converting the estimated water inflow rate into a hydroelectric power generating capacity.

[Problem to be Solved by the Invention]

Generally, a hydroelectric power generating capacity in the future is estimated based on a precipitation amount of the upper stream of the river, a water flow rate of the upper stream of the river, and an actual water inflow rate into a dam within the past few weeks. In many cases, dam operators make a function to calculate a water inflow rate in the future based on such data, input data that were obtained at certain times within the past few weeks to the function, and then convert the estimated water inflow rate into a hydroelectric power generating capacity.

In this method, however, operators have to make a function for each dam. Then, a water inflow rate in the future should be calculated using this function and converted into a hydroelectric power generating capacity in an approximate way. As a result, a hydroelectric power generating capacity cannot be estimated with a high accuracy even if operators precisely modify a function itself.

In view of such a problem, it is an object of the present invention to provide an estimation system of a hydroelectric power generating capacity that can directly estimate a hydroelectric power generating capacity with a high accuracy.

[Means for Solving the Problem]

According to the invention of Claim 1, a neural network is trained through supervised machine learning using a training data. The training data includes an input data containing a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water inflow rate into a dam during a predetermined period between a reference time and a predetermined time before the reference time; and an output data containing a hydroelectric power generating capacity in the future after the reference time. In response to an input of a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water inflow rate into a dam before the current time to the trained neural network, a hydroelectric power generating capacity in the future is estimated.

According to the invention of Claim 2, the input data further includes a temperature of the upper stream of the river during a predetermined period between a reference time and a predetermined time before the reference time.

[Effects of the Invention]

According to the invention of Claim 1, a hydroelectric power generating capacity in the future can directly be estimated with a high accuracy using a trained neural network.

According to the invention of Claim 2, a temperature of the upper stream of the river is added to the input data. It allows a highly accurate estimation of an actual hydroelectric power generating capacity all year round, including the spring with a low

precipitation. It has not been considered that there is a correlation between a hydroelectric power generating capacity and a temperature of the upper stream of the river, so far. However, it is possible to achieve a more accurate estimation taking an increase of inflow rate due to meltwater into consideration, with the use of an input data further containing a temperature.

[State of the art (Prior art, well-known art, etc.)]
Cited invention 1 (Invention disclosed in the cited document 1 (D1)):

An estimation system of a hydroelectric power generating capacity that carries out a multiple regression analysis by an information processor, comprising:

a regression equation model, in which explanatory variables are a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water inflow rate into a dam during a predetermined period between a reference time and a predetermined time before the reference time, and an objective variable is a hydroelectric power generating capacity in the future after the reference time;

an analysis unit that calculates a partial regression coefficient of the regression equation model based on actual values corresponding to the explanatory variables and the objective variable; and

an estimation unit that, into the regression equation model to which the partial regression coefficient that has been calculated by the analysis unit is set, inputs data of the explanatory variables with setting a current time as the reference time, and then, calculates an estimated value of a future hydroelectric power generating capacity based on an output data from the objective variable setting a current time as the reference time.

Well-known art:

In the technical field of machine learning, it is well-known that an estimation process of an output in the future is carried out based on an input of time series data in the past, by using a trained neural network which has been trained with a training data containing an input of time series data in the past and a certain output in the future.

[Conclusion]

The invention of Claim 1 does not have an inventive step.

The invention of Claim 2 has an inventive step.

[Overview of Reason for Refusal]

The invention of Claim 1 and Cited Invention 1 are different from each other at the point below.

(Difference)

The invention of Claim 1 realizes an estimation of a hydroelectric power

generating capacity by means of a neural network having an input layer and output layer. Meanwhile, Cited Invention 1 realizes an estimation of a hydroelectric power generating capacity by means of a regression equation model.

The difference is assessed as follows.

It is well known that an estimation process of an output in the future is carried out based on an input of time series data in the past, using a trained neural network. The neural network has been trained with a training data containing an input of time series data in the past and a certain output in the future. Cited Invention 1 and the well-known art are common with each other in estimating a certain output in the future based on an input of time series data in the past, with reference to a correlation among data.

Therefore, a person skilled in the art could easily derive a configuration that enables estimation of a hydroelectric power generating capacity, by applying the well-known art to Cited Invention 1 and adopting a trained neural network in substitution of a regression equation model.

Further, a person skilled in the art would expect the effect of the invention of Claim 1, and there is no obstructive factor found in applying the well-known art to Cited Invention 1.

[Explanation]
(Considered Motivation)
(1) Identical Operation or Function

Both Cited Invention 1 and the well-known art are common in an estimation of an output in the future through an input of time series data in the past based on a correlation among data, and are common in the function with each other.

(Explanation for no reason for refusal)

The invention of Claim 2 and Cited Invention 1 are different from each other at the point below.

(Difference)

The invention of Claim 2 contains, in an input data into an input layer, a temperature of the upperstream of the river during a predetermined period between a reference time and a predetermined time before the reference time. Meanwhile, Cited Invention 1 does not have such a configuration.

The difference is assessed as follows.

The invention of Claim 2 uses a temperature of the upperstream of the river for estimation of a hydroelectric power generating capacity. There is no prior art found

disclosing such use of a temperature of the upperstream of the river. Accordingly, it is not a common general technical knowledge that there is a correlation between a temperature and a hydroelectric power generating capacity.

Generally, an input of data of which correlation is unknown may cause a noise in machine learning. However, the invention of Claim 2 uses an input data containing a temperature of the upperstream of the river during a predetermined period between a reference time and a predetermined time before the reference time. This enables a highly accurate estimation of a hydroelectric power generating capacity, taking an increase of inflow rate due to meltwater in the spring into consideration. It is a significant effect that a person skilled in the art cannot expect.

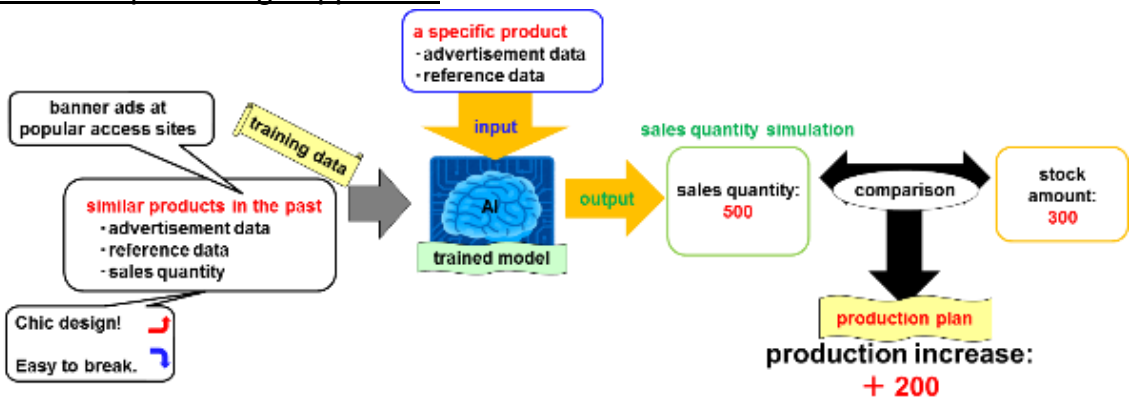
Accordingly, it does not considered to be a mere workshop modification that can be carried out in application of the well-known art to Cited Invention 1 by a person skilled in the art to contain, in an input data in an estimation of a hydroelectric power generating capacity, a temperature of the upperstream of the river during a predetermined period between a reference time and a predetermined time before the reference time.

Therefore, the invention of Claim 2 has an inventive step.

**[Case example 3]**

**<assessment of Description Requirements>**

Business plan design apparatus




What is claimed is:

[Claim 1]

A business plan design apparatus comprising:

a storage means for storing a stock amount of a specific product;

a reception means for receiving a web advertisement data and mention data of the specific product;

a simulation and output means for, using an estimation model that has been trained through machine learning with a training data containing a web advertisement data and mention data of a similar product that has been sold in the past and a sales quantity of the similar product, simulating and outputting a future sales quantity of the specific product estimated based on the web advertisement data and mention data of the specific product;

a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the output sales quantity; and

an output means for outputting the output sales quantity and the production plan.

Overview of the Description

As the internet is widely spreading, a web advertisement has become an effective way for sales promotion of a product. However, it cannot readily be determined on-site whether a web advertisement is actually effective, and through trial and error, not a few business opportunities have been wasted due to stock shortage or the like. In view of this, it is an object of the present invention to provide a business plan design apparatus that estimates a sales quantity of a specific product in the future based on a web advertisement data and mention data of the product, and presents a production plan of the product including a future production quantity based on a stored stock amount and an estimated sales quantity. With this apparatus, a seller of a specific product can revise a production plan of the product at an early stage.

The business plan design apparatus firstly stores a stock amount of a specific product. The apparatus then obtains an estimated product sales quantity of the product based on an input of a web advertisement data and mention data of the product, using an estimation model that outputs an estimated product sales quantity. In this case, the web advertisement data is the number of times when the specific product publicly appeared on the web. The advertisement includes banner ads, product listing ads, and direct e-mails. The mention data includes reviews on the product or advertisement in web articles, social media, and blogs etc. In the reviews on the product or advertisement, an evaluation value is set so that it becomes greater if there are a lot of positive reviews, and otherwise, it becomes lower. The evaluation value can be obtained through a known computer processing on the text in web articles, social media, and blogs etc. The estimation model is generated through a supervised machine learning with a training data using a known machine learning algorithm such as a neural network. The training data contains a relation between a web advertisement data and mention data of a similar product that has been sold in the past and an actual sales quantity of the similar product.

The model compares the stored stock amount and the estimated sales quantity of the product. Then, the model makes a plan for an increased production if the sales quantity exceeds the stored stock amount, and otherwise, makes a plan for a decreased production.

The apparatus, using the estimation model that has been trained in this way, simulates a sales quantity of a product, compares the sales quantity and a stock amount of the product, and presents the comparison in a manner that a user can readily determine whether a production of the product should be increased or decreased.

Note:

In this case, it is assumed that, in view of a common general technical knowledge at the time of filing, a person skilled in the art can presume a certain relation such as a correlation (hereinafter, referred to as a “correlation or the like” in this Case Example) between the advertisement data and reference data on the web and the sales quantity.

[Conclusion]

The description satisfies the enablement requirement with regard to claim 1.

Notes

 Article 36(4)(i) (Enablement Requirement)

The description discloses that a web advertisement data and mention data are used. The web advertisement data is based on the number of times when a specific product publicly appeared on the web, and the mention data is based on an evaluation

value of reviews on the product or advertisement in web articles, social media, and blogs etc.

Although the description does not discloses a correlation or the like between the web advertisement data and the mention data, it can be presumed that there is a correlation or the like between them in view of a common general technical knowledge at the time of filing.

Further, it is known at the time of filing that an estimation model can be generated that estimates an output in response to an input through machine learning with a training data containing an input data and output data having a correlation or the like, using a generally-used machine learning algorithm.

In view of the above, an estimation model can be generated using a universal machine learning algorithm with a training data containing the number of times when a similar product publicly appeared on a web advertisement, an evaluation value of reviews on the product or advertisement in web articles, social media, and blogs etc., and a sales quantity of the similar product. Accordingly, it is obvious for a person skilled in the art that a business plan design apparatus can be derived that simulates and outputs a sales quantity of a specific product, makes a production plan of the specific product based on the output sales quantity, using the above estimation model.

Therefore, a “business plan design apparatus” in Claim 1 is disclosed in the description in a manner that a person skilled in the art can make and use the apparatus. In other words, the description provides a clear and sufficient disclosure for a person skilled in the art to carry out the invention.

# Case 1

## Ref.3-2 JPO's three CaseExamples Complimentary

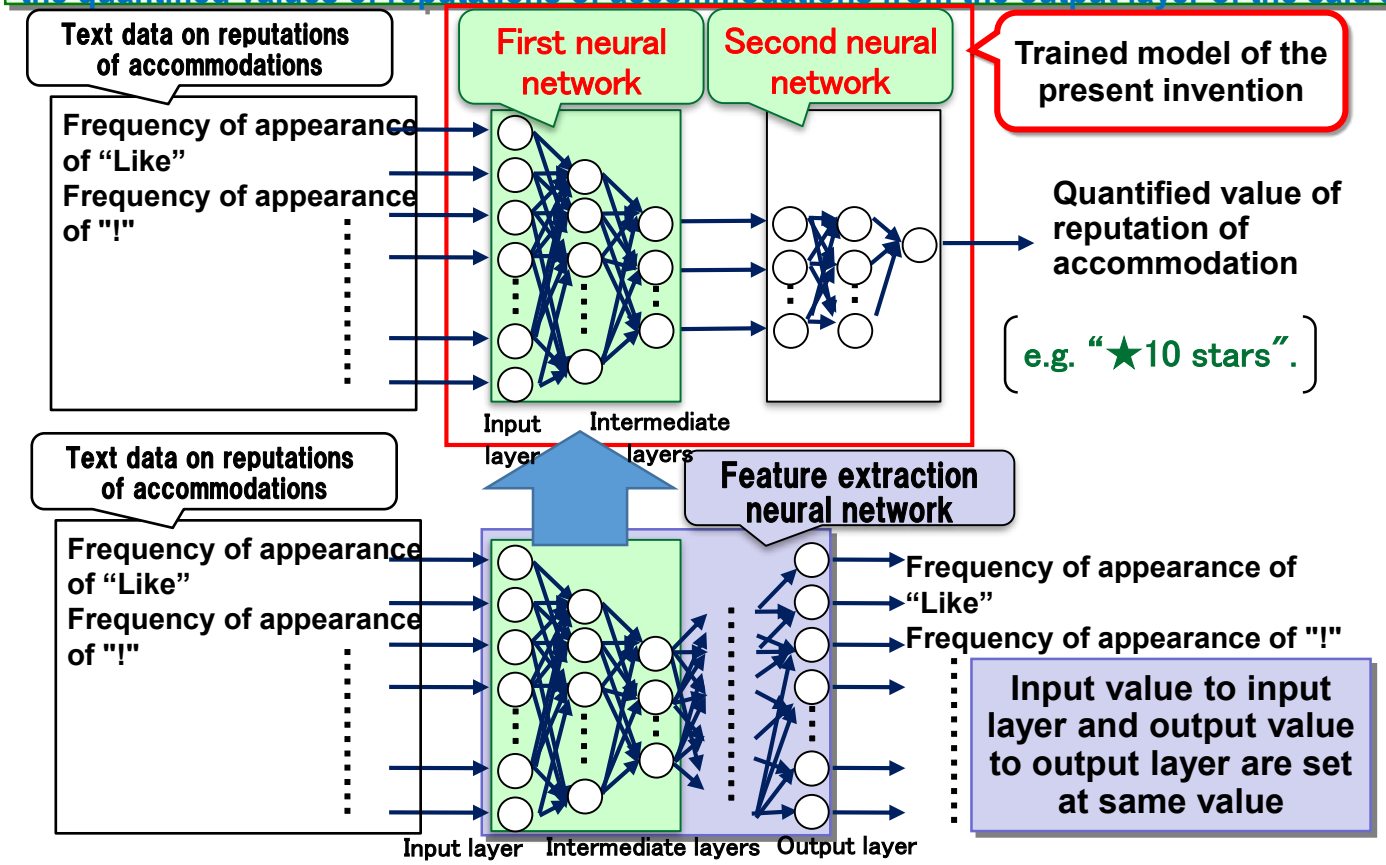
) Data analysis and learning>

Examination Handbook Annex B
Chapter 1, 3.Cases, Case 2-14

## Eligibility (Trained model for analyzing reputations of accommodations)

**[Claim 1]**

A trained model for causing a computer to function to output quantified values of reputations of accommodations based on text data on reputations of accommodations, wherein; the model is comprised of a first neural network and a second neural network connected in a way that the said second neural network receives output from the said first neural network; the said first neural network is comprised of an input layer to intermediate layers of a feature extraction neural network in which the number of neurons of at least one intermediate layer is smaller than the number of neurons of the input layer, the number of neurons of the input layer and the number of the output layer are the same, and weights were trained in a way each value input to the input layer and each corresponding value output from output layer become equal; weights of the said second neural network were trained without changing the weights of the said first neural network; and the model causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network.




**[Detailed Description of the Invention]**

The trained model of the present invention is supposed to be utilized as a program module which constitutes a part of artificial intelligence software.

…

The trained model of the present invention is utilized in a computer equipped with a CPU and a memory. Specifically, the CPU of the computer operates, in accordance with instructions from the trained model stored in the memory, in a way that it performs a calculation based on trained weights and response functions in the first and second neural networks in response to data input to input layers of the first neural network (appearance frequency of specific words obtained from text data of reputations of accommodations, e.g. by performing morphological analyses) and outputs results (quantified values of reputations) from output layers of the second neural network.

# Eligibility (Trained model for analyzing reputations of accommodations)

## ◎ Fall under invention

[Explanation]

The trained model of Claim 1 is what causes the computer to function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network.

Moreover, considering the descriptions which states that "the trained model is supposed to be utilized as a program module which constitutes a part of artificial intelligence software" and "the CPU of the computer operates, in accordance with instructions from the trained model stored in the memory, in a way that it performs a calculation based on trained weights and response functions in the first and second neural networks in response to data input to input layers of the first neural network and outputs results from output layers of the second neural network".

Considering the Claim and detailed description of the invention, it is clear that the trained model of Claim 1 is a "program" even though the claimed subject matter of Claim 1 is described as a "model. (*)

Moreover, it is determined, from the statement of Claim 1, that specific calculation or processing of specific information depending on the intended use which is accurate analysis of reputations of accommodations, is implemented by specific means or specific procedures on which software and hardware resources cooperate, which is for a computer to "function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network."

For this reason, in the trained model of Claim 1, a specific information processing system depending on intended use is constructed through cooperation of software and hardware resources.

Therefore, since the information processing by software is specifically implemented by using hardware resources, the trained model of Claim 1 is a creation of the technical idea utilizing a law of nature and thus falls under "invention".

(*) The trained model of Claim 1 is not composed only of weights (a parameter set) for the neural network, but it is a "program."

# Case 2

## ESTIMATION SYSTEM OF HYDROELECTRIC GENERATING CAPACITY

Claim 1: mere a modification of estimation method to estimate output data based on input data, and considered to be lack of inventive step
Claim 2: a significant effect is found because of addition of training data for machine learning, and considered to have inventive step

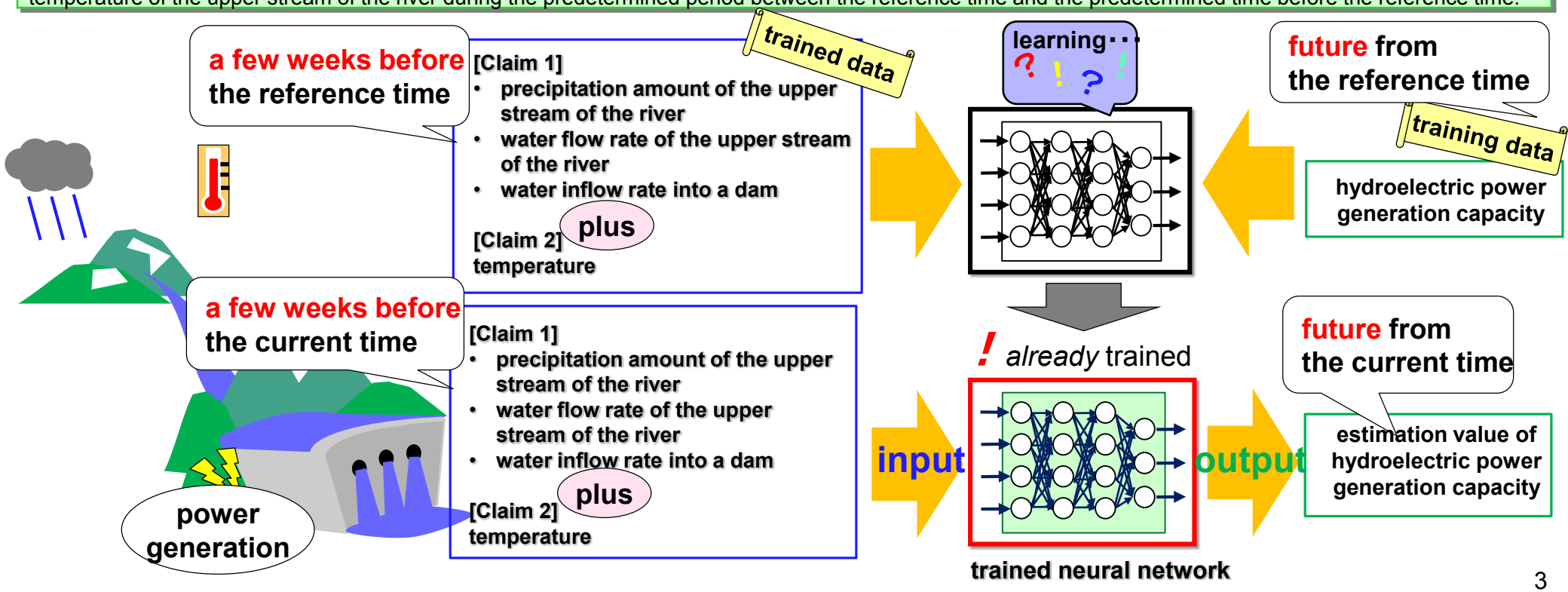
**[Claim 1]** An estimation system of a hydroelectric power generating capacity of a dam comprising:

a neural network that is built by means of an information processor, the neural network having an input layer and an output layer, in which an input data to the input layer containing a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water inflow rate into a dam during a predetermined period between a reference time and a predetermined time before the reference time, and an output data from the output layer containing a hydroelectric power generating capacity in the future after the reference time;

a machine learning unit that trains the neural network using a training data corresponding to actual values of the input data and the output data; and

an estimation unit that inputs the input data to the neural network that has been trained by the machine learning unit with setting a current time as the reference time, and then calculates an estimated value of a future hydroelectric power generating capacity based on the output data of which reference time is the current time.

**[Claim 2]** The estimation system of a hydroelectric power generating capacity as in Claim 1, wherein the input data to the input layer further contains a temperature of the upper stream of the river during the predetermined period between the reference time and the predetermined time before the reference time.



# Case 2

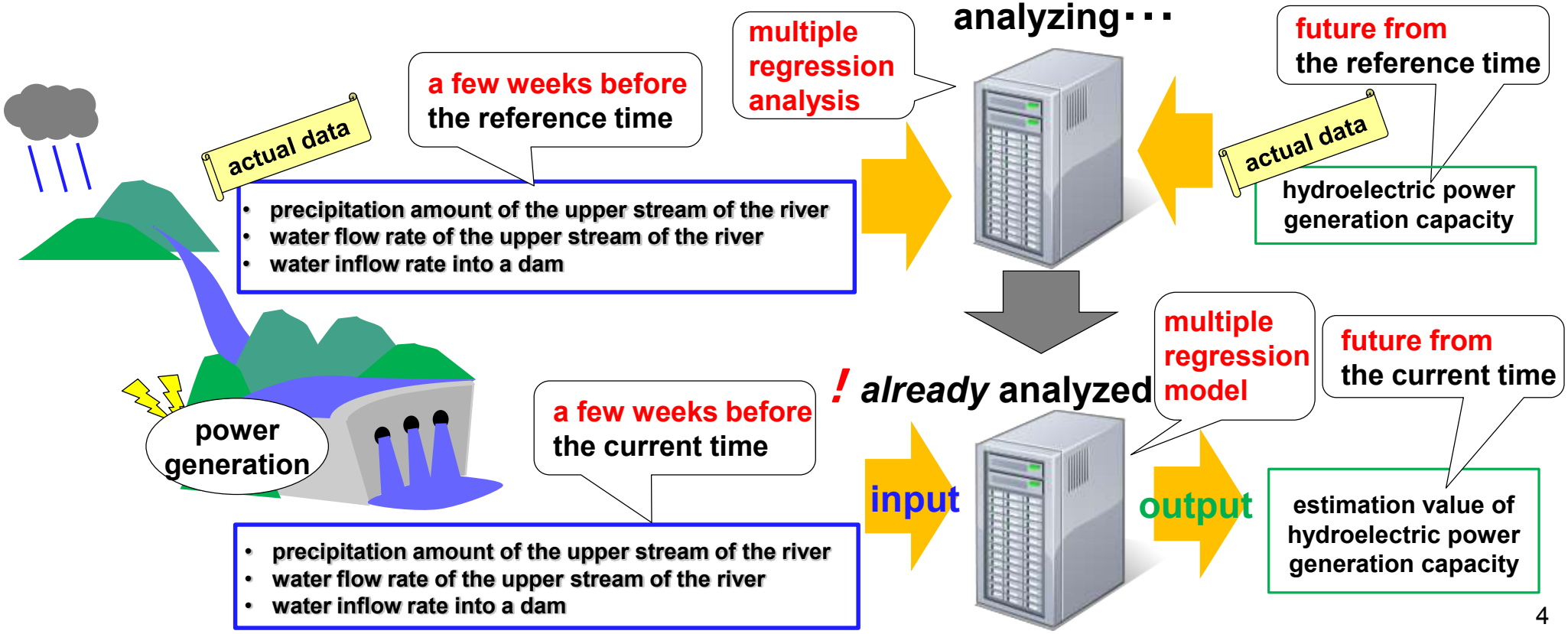
## ESTIMATION SYSTEM OF HYDROELECTRIC GENERATING CAPACITY

**[Cited Invention 1]** An estimation system of a hydroelectric power generating capacity that carries out a multiple regression analysis by an information processor, comprising:

a regression equation model, in which explanatory variables are a precipitation amount of the upper stream of a river, a water flow rate of the upper stream of the river, and a water inflow rate into a dam during a predetermined period between a reference time and a predetermined time before the reference time, and an objective variable is a hydroelectric power generating capacity in the future after the reference time;

an analysis unit that calculates a partial regression coefficient of the regression equation model based on actual values corresponding to the explanatory variables and the objective variable; and

an estimation unit that, into the regression equation model to which the partial regression coefficient that has been calculated by the analysis unit is set, inputs data of the explanatory variables with setting a current time as the reference time, and then, calculates an estimated value of a future hydroelectric power generating capacity based on an output data from the objective variable setting a current time as the reference time.



# Case 2

## ESTIMATION SYSTEM OF HYDROELECTRIC GENERATING CAPACITY

**[Well-known Art]** In the technical field of machine learning, it is well-known that an estimation process of an output in the future is carried out based on an input of time series data in the past, by using a trained neural network which has been trained with a training data containing an input of time series data in the past and a certain output in the future.

**✕ The invention of Claim 1 lacks an inventive step.**

**○ The invention of Claim 2 has an inventive step.**

**[Overview of Reason for Refusal]**

The invention of Claim 1 and Cited Invention 1 are different from each other at the point below.

**(Difference)**

The invention of Claim 1 realizes an estimation of a hydroelectric power generating capacity by means of a neural network having an input layer and output layer. Meanwhile, Cited Invention 1 realizes an estimation of a hydroelectric power generating capacity by means of a regression equation model.

The difference is assessed as follows. ・・・・・・Cited Invention 1 and the well-known art are common with each other in estimating a certain output in the future based on an input of time series data in the past, with reference to a correlation among data. Therefore, a person skilled in the art could easily derive a configuration that enables estimation of a hydroelectric power generating capacity, by applying the well-known art to Cited Invention 1 and adopting a trained neural network in substitution of a regression equation model.

**(Basis for Determination that there is No Reason for Refusal found)**

The invention of Claim 2 and Cited Invention 1 are different from each other at the point below.

**(Difference)**

The invention of Claim 2 contains, in an input data into an input layer, a temperature of the upperstream of the river during a predetermined period between a reference time and a predetermined time before the reference time. Meanwhile, Cited Invention 1 does not have such a configuration.

The difference is assessed as follows.

The invention of Claim 2 uses a temperature of the upperstream of the river for estimation of a hydroelectric power generating capacity. There is no prior art found disclosing such use of a temperature of the upperstream of the river. Accordingly, it is not a common general technical knowledge that there is a correlation between a temperature and a hydroelectric power generating capacity.

Generally, an input of data of which correlation is unknown may cause a noise in machine learning. However, the invention of Claim 2 uses an input data containing a temperature of the upperstream of the river during a predetermined period between a reference time and a predetermined time before the reference time. This enables a highly accurate estimation of a hydroelectric power generating capacity, taking an increase of inflow rate due to meltwater in the spring into consideration. It is a significant effect that a person skilled in the art cannot expect.

Accordingly, it does not considered to be a mere workshop modification that can be carried out in application of the well-known art to Cited Invention 1 by a person skilled in the art to contain, in an input data in an estimation of a hydroelectric power generating capacity, a temperature of the upperstream of the river during a predetermined period between a reference time and a predetermined time before the reference time.

# Case 3

## BUSINESS PLAN DESIGN APPARATUS

**Claim 1: There is no reason for refusal found.**

The description does not disclose a specific correlation among each data in a training data. However, such a specific correlation is a common general technical knowledge at the time of filing, and the description requirement is satisfied.

**[Claim 1]**

A business plan design apparatus comprising:

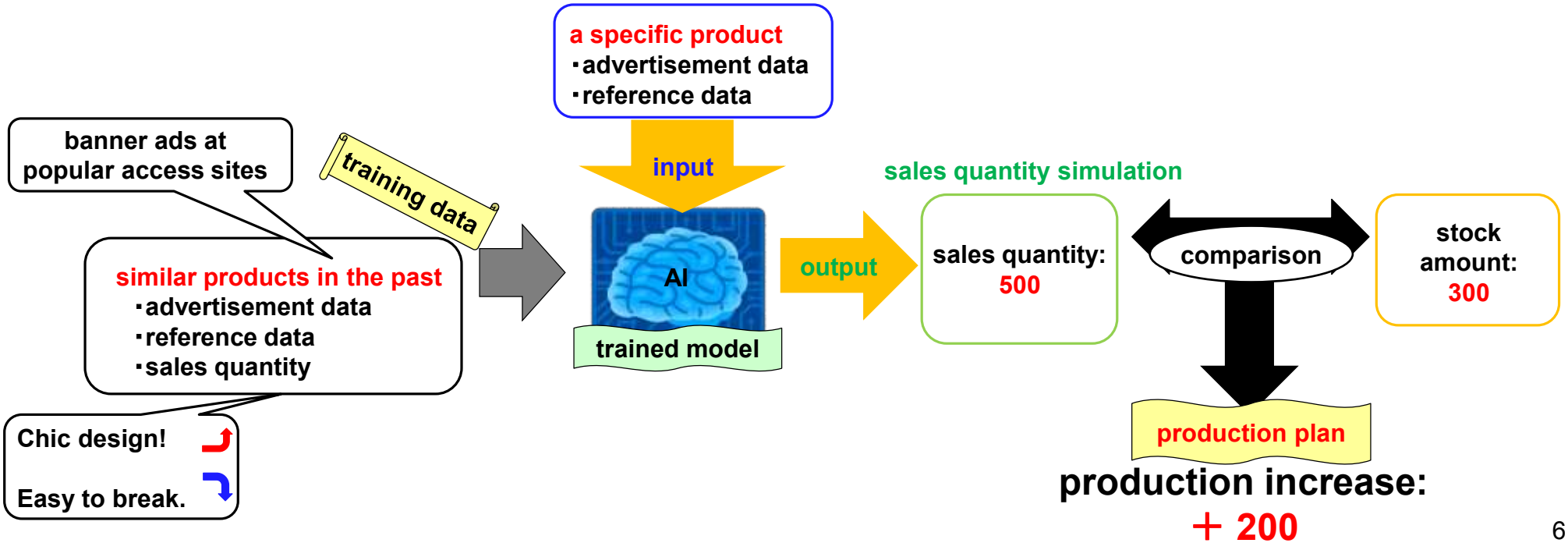
a storage means for storing a stock amount of a specific product;

a reception means for receiving a web advertisement data and mention data of the specific product;

a simulation and output means for, using an estimation model that has been trained through machine learning with a training data containing a web advertisement data and mention data of a similar product that has been sold in the past and a sales quantity of the similar product, simulating and outputting a future sales quantity of the specific product estimated based on the web advertisement data and mention data of the specific product;

a production plan making means for planning a future production quantity of the specific product, based on the stored stock amount and the output sales quantity; and

an output means for outputting the output sales quantity and the production plan.



# Case 3

## BUSINESS PLAN DESIGN APPARATUS

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**[Overview of the Description]**

As the internet is widely spreading, a web advertisement has become an effective way for sales promotion of a product. However, it cannot readily be determined on-site whether a web advertisement is actually effective, and through trial and error, not a few business opportunities have been wasted due to stock shortage or the like. In view of this, it is an object of the present invention to provide a business plan design apparatus that estimates a sales quantity of a specific product in the future based on a web advertisement data and mention data of the product, and presents a production plan of the product including a future production quantity based on a stored stock amount and an estimated sales quantity. With this apparatus, a seller of a specific product can revise a production plan of the product at an early stage.

The business plan design apparatus firstly stores a stock amount of a specific product. The apparatus then obtains an estimated product sales quantity of the product based on an input of a web advertisement data and mention data of the product, using an estimation model that outputs an estimated product sales quantity. In this case, the web advertisement data is the number of times when the specific product publicly appeared on the web. The advertisement includes banner ads, product listing ads, and direct e-mails. The mention data includes reviews on the product or advertisement in web articles, social media, and blogs etc. In the reviews on the product or advertisement, an evaluation value is set so that it becomes greater if there are a lot of positive reviews, and otherwise, it becomes lower. The evaluation value can be obtained through a known computer processing on the text in web articles, social media, and blogs etc. The estimation model is generated through a supervised machine learning with a training data using a known machine learning algorithm such as a neural network. The training data contains a relation between a web advertisement data and mention data of a similar product that has been sold in the past and an actual sales quantity of the similar product.

**[Overview of Reason for Refusal ]**

**・There is no reason for refusal found.**

**[Note]**

**・Article 36(4)(i) (Enablement Requirement)**

According to the description, it is an object of the present invention to provide a business plan design apparatus that estimates a sales quantity of a specific product in the future based on a web advertisement data and mention data of the product, and presents a production plan of the product including a future production quantity based on a stored stock amount and an estimated sales quantity. Further, the description discloses that a web advertisement data and mention data are used. The web advertisement data is based on the number of times when a specific product publicly appeared on the web, and the mention data is based on an evaluation value of reviews on the product or advertisement in web articles, social media, and blogs etc.

Although the description does not discloses a correlation or the like between the web advertisement data and the mention data, it can be presumed that there is a correlation or the like between them in view of a common general technical knowledge at the time of filing.

Further, it is known at the time of filing that an estimation model can be generated that estimates an output in response to an input through machine learning with a training data containing an input data and output data having a correlation or the like, using a generally-used machine learning algorithm.

In view of the above, an estimation model can be generated using a universal machine learning algorithm with a training data containing the number of times when a similar product publicly appeared on a web advertisement, an evaluation value of reviews on the product or advertisement in web articles, social media, and blogs etc., and a sales quantity of the similar product. Accordingly, it is obvious for a person skilled in the art that a business plan design apparatus can be derived that simulates and outputs a sales quantity of a specific product, makes a production plan of the specific product based on the output sales quantity, using the above estimation model.

ERIA Research Project 2019 & 2020

# Introduction to ERIA's Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

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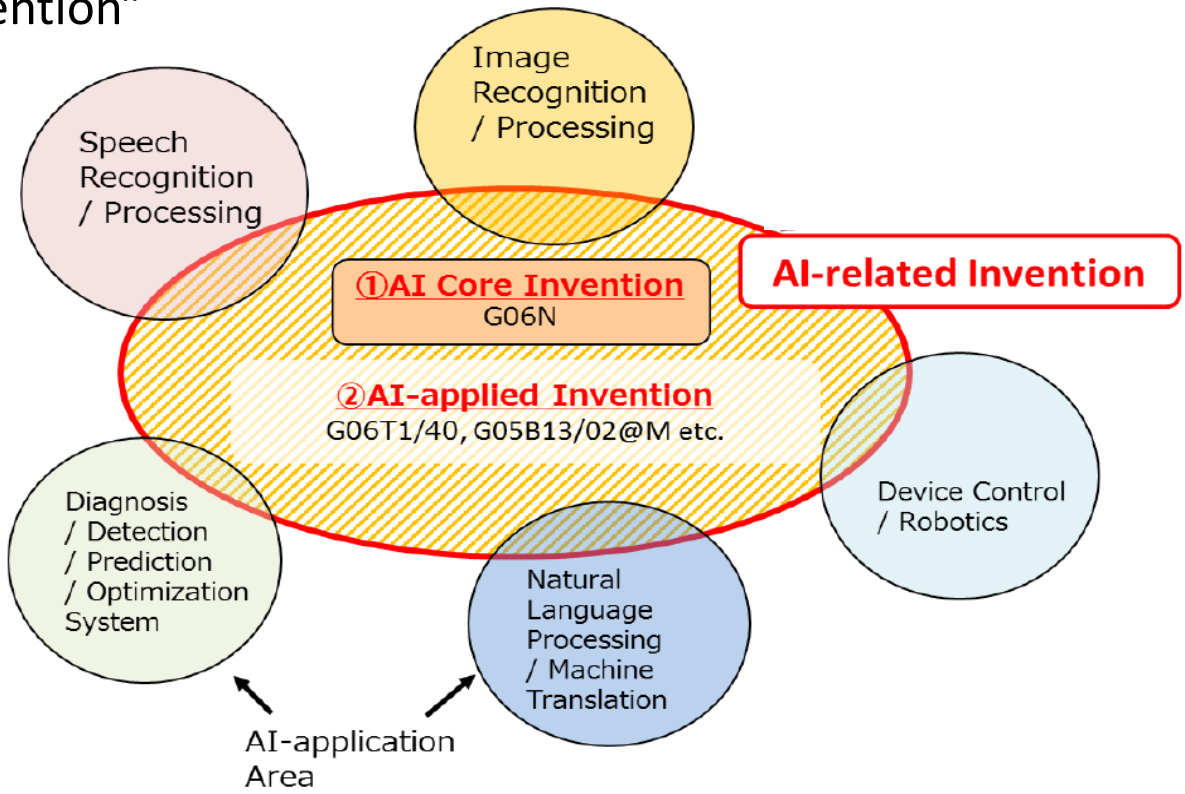
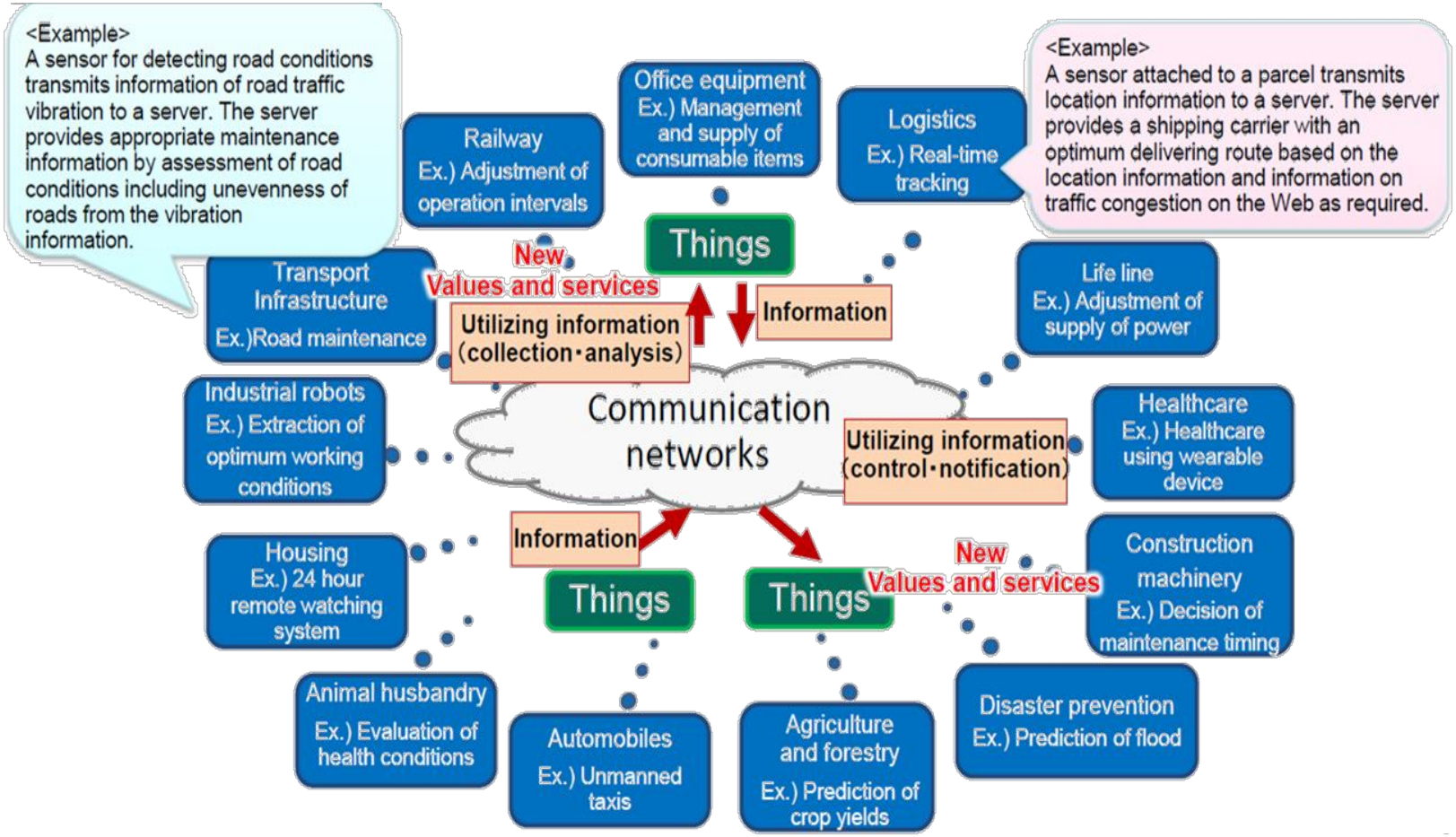
# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

- Definition of the AI-related invention
  = "AI Core Invention" and "AI-applied Invention"
- "AI Core Invention": Inventions characterized by mathematical or statistical information processing technology that forms the basis of AI (mainly G06N)
- "AI-applied Invention": Inventions characterized by applying "AI core invention" to various technical fields.



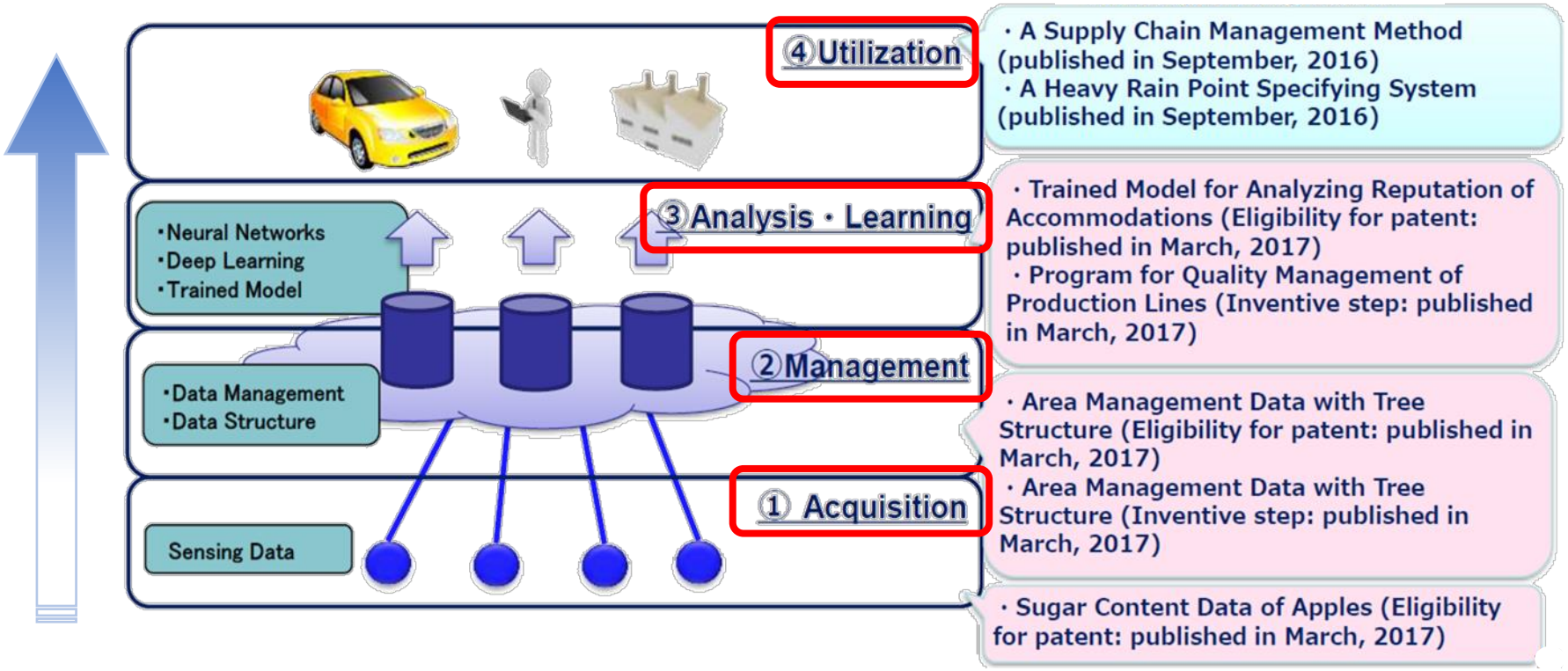
# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

- Rapid progress is being made in R&D and application to business of “technologies that utilize information obtained by connecting ‘things’ to networks, thereby finding new values and services,” i.e. IoT(Internet of Things)-related technology.

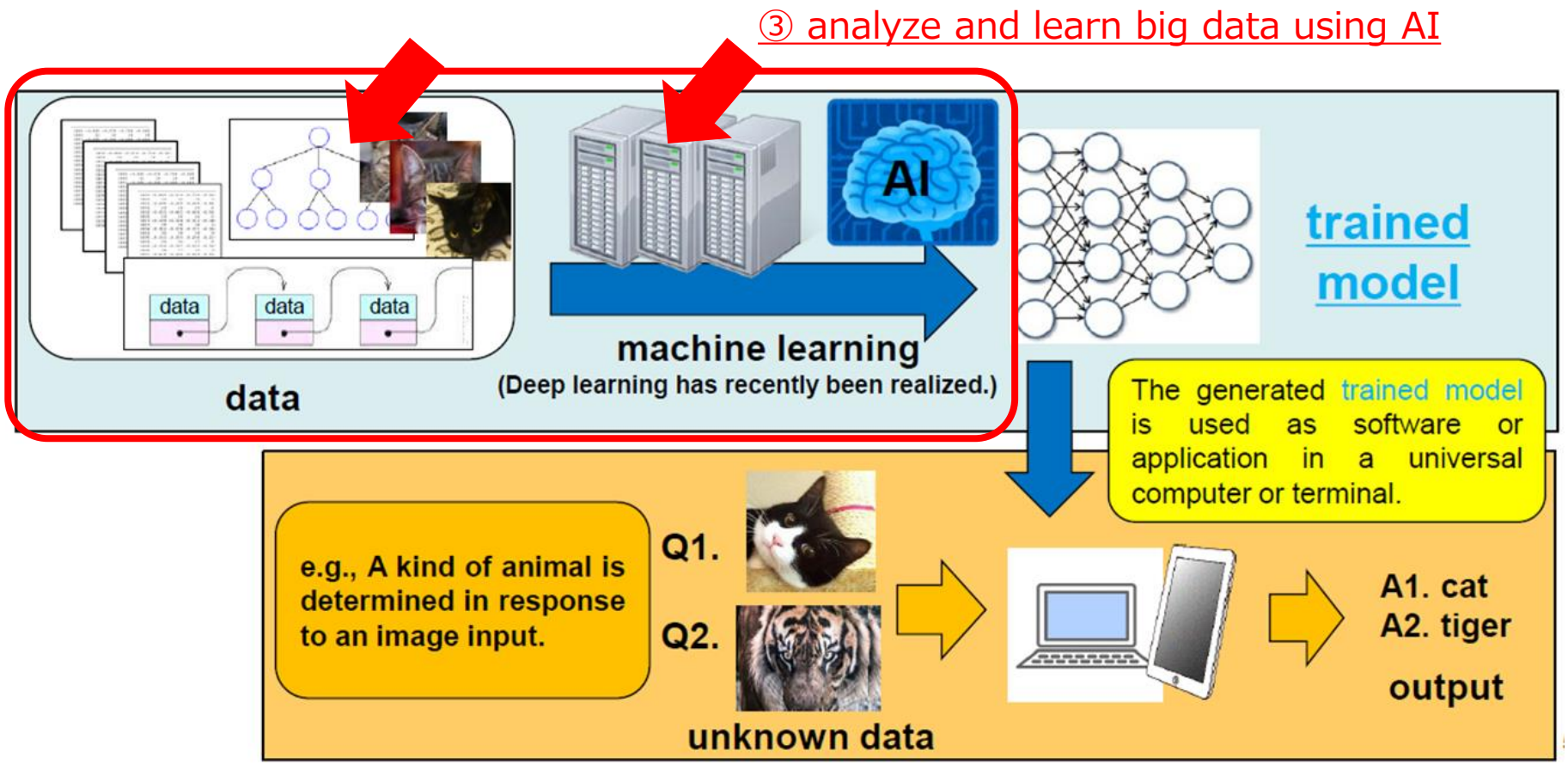


# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

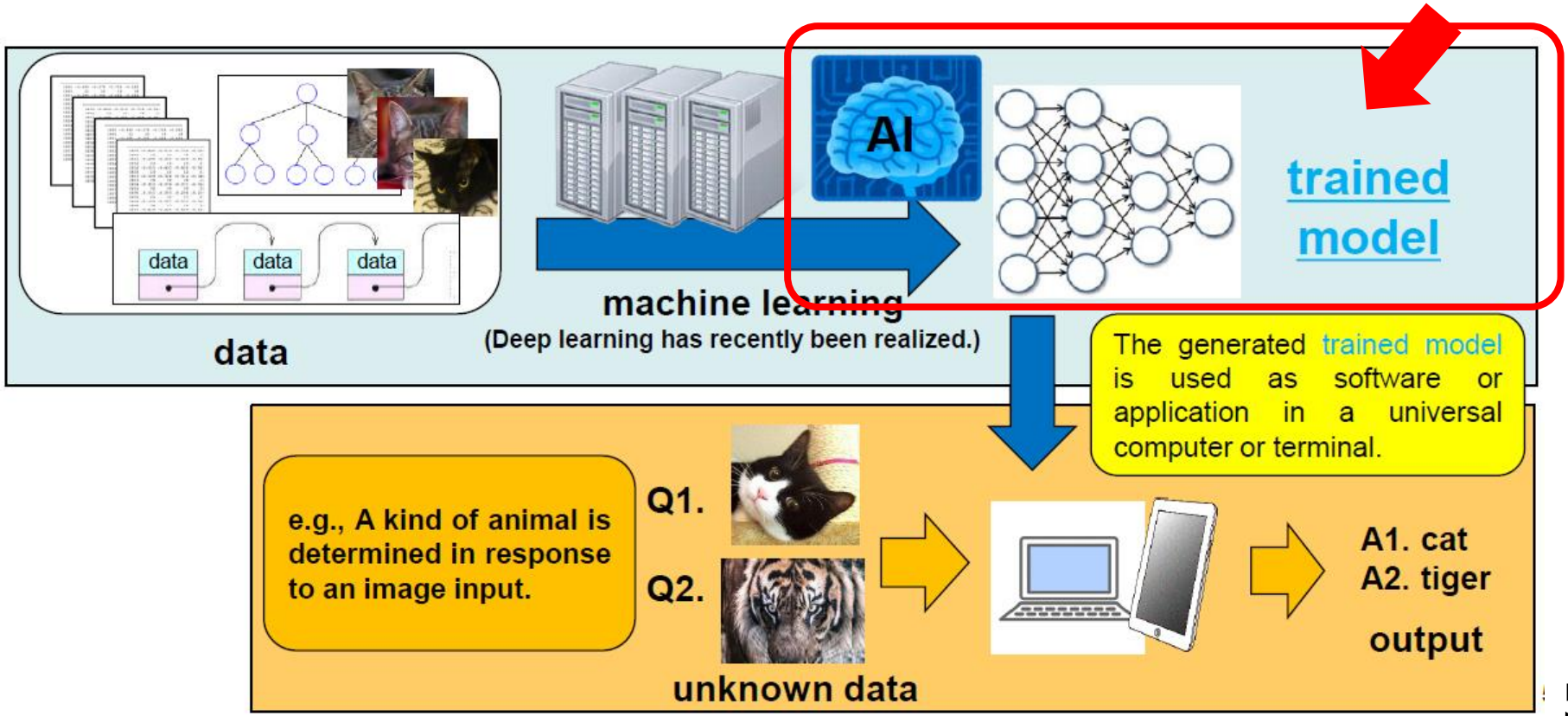
- IoT-related technologies are utilized in various technical fields.
- When considered from the perspective of "data," which is becoming more important, the IoT-related technologies follow the four steps: i.e. ① acquire various data, ② manage data collected via networks, ③ analyze and learn big data using AI and the like, and ④ utilize data while finding out new values and services.



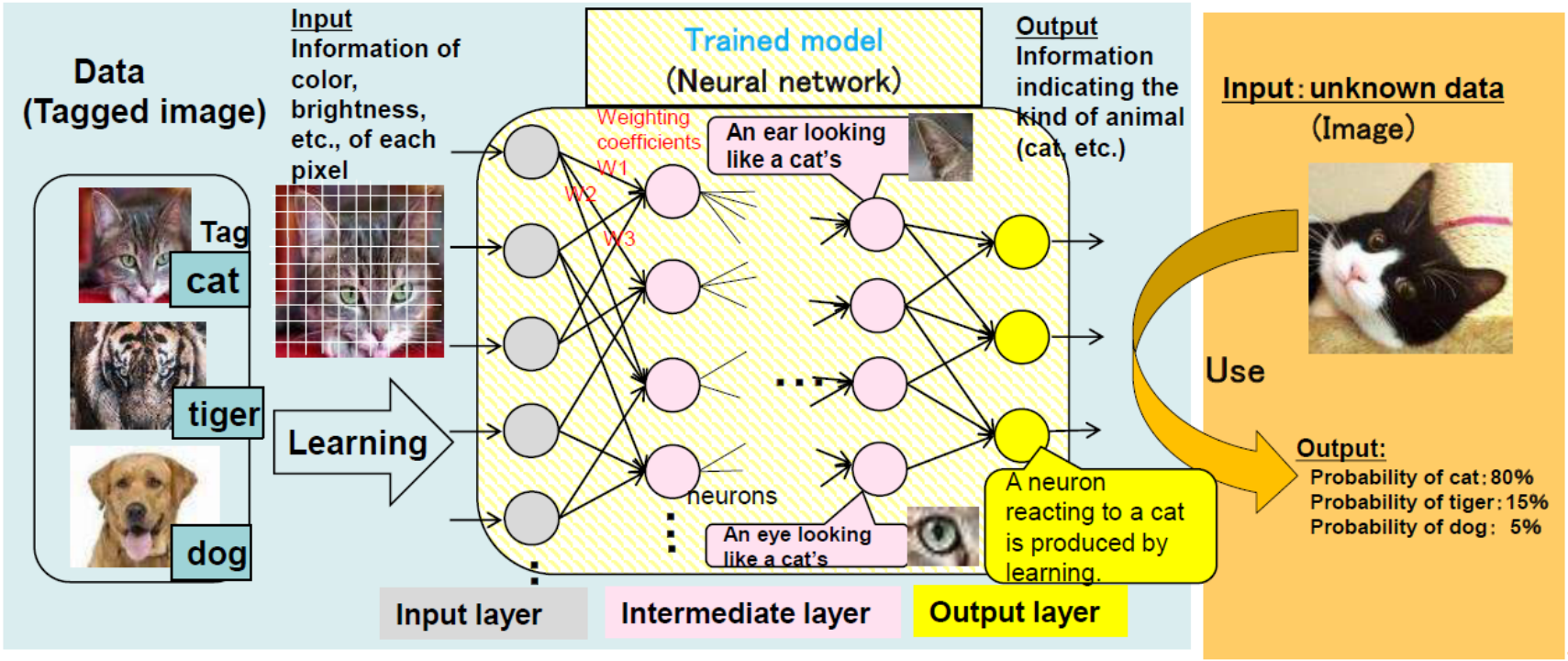
- A big data that has been collected through IoT-related technologies are analyzed and learned through AI-based machine learning in many cases (the item ③ of the previous slide). There are many machine learning methods.



- A recent drastic development in computer calculation performance realized a deep learning using a multi-layer neural network, and a high quality trained model can be generated based on a big data.
- The trained model that has been generated in this way can output a correct solution even for an unknown data.

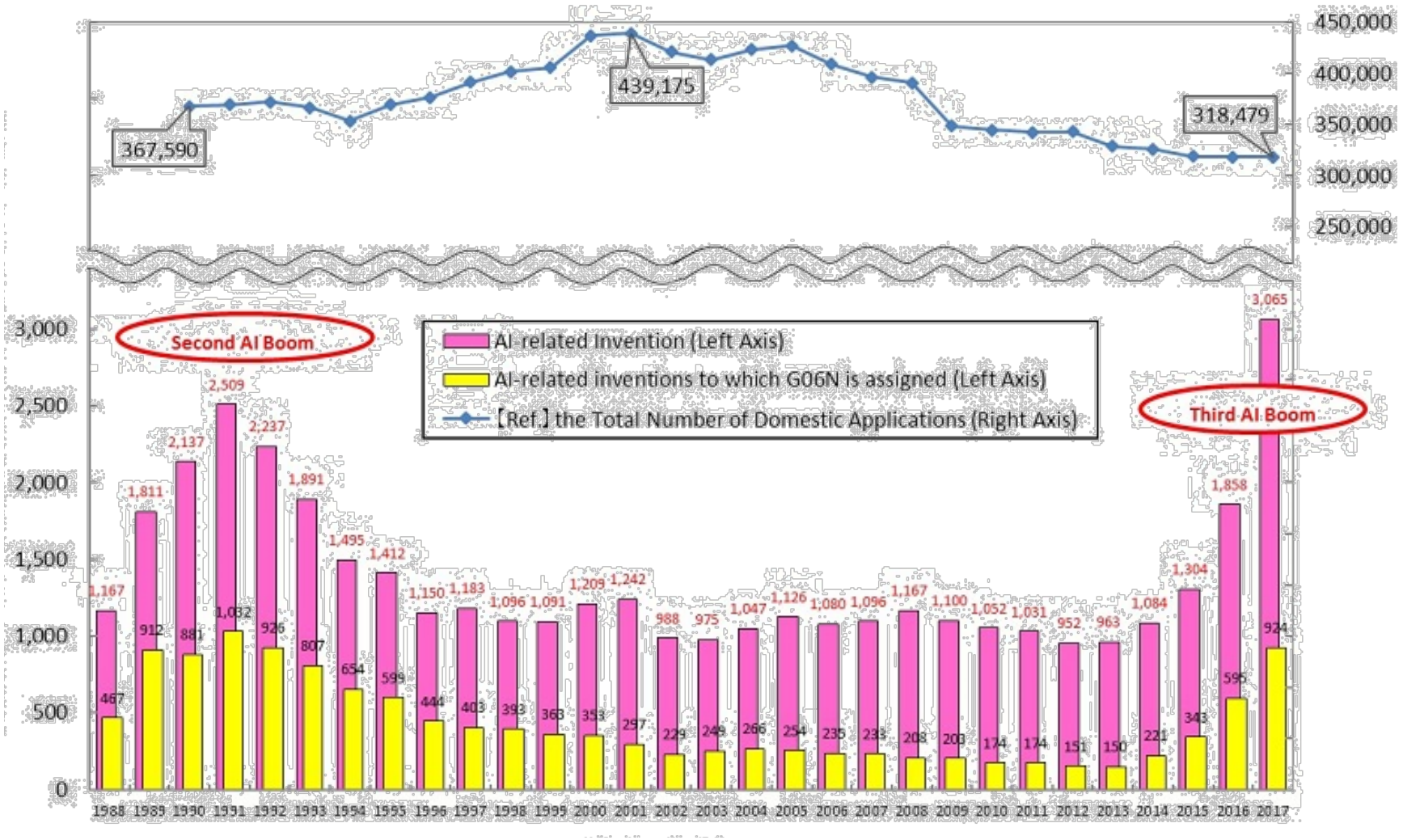


- Trained models which simulate the mechanism of neural circuits of the human brain are normally formed of a combination of (i) a program calculating from input to output and (ii) weighting coefficients (parameters) used for the said calculation.
- Deep learning is the machinery learning method using a neural network where the intermediate layer is formed of multiple layers, and can produce high-quality trained models



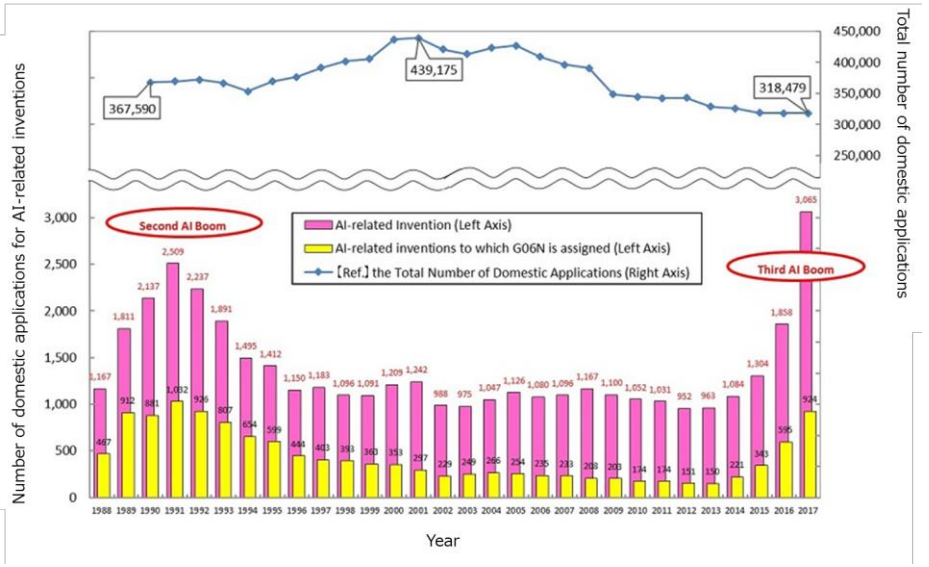
# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

## ☐ Number of applications filed with JPO for AI-related inventions



# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

- The AI-related inventions have increased sharply since 2014, with about 3,000 in 2017 (of which about 900 are classified into G06N).
- Also, it can be seen from the graph that AI-related inventions (the pink bar) have increased and decreased in accordance with the applications classified into G06N.
- Application growth after 2014 is considered to be the influence of the so-called the third AI boom, and machine learning including neural networks plays a leading role (Especially, deep learning roles a major position.).
- It seems that factors pushing up the number of applications for the third AI boom are G06N3/02-3/10 and G06N20/.

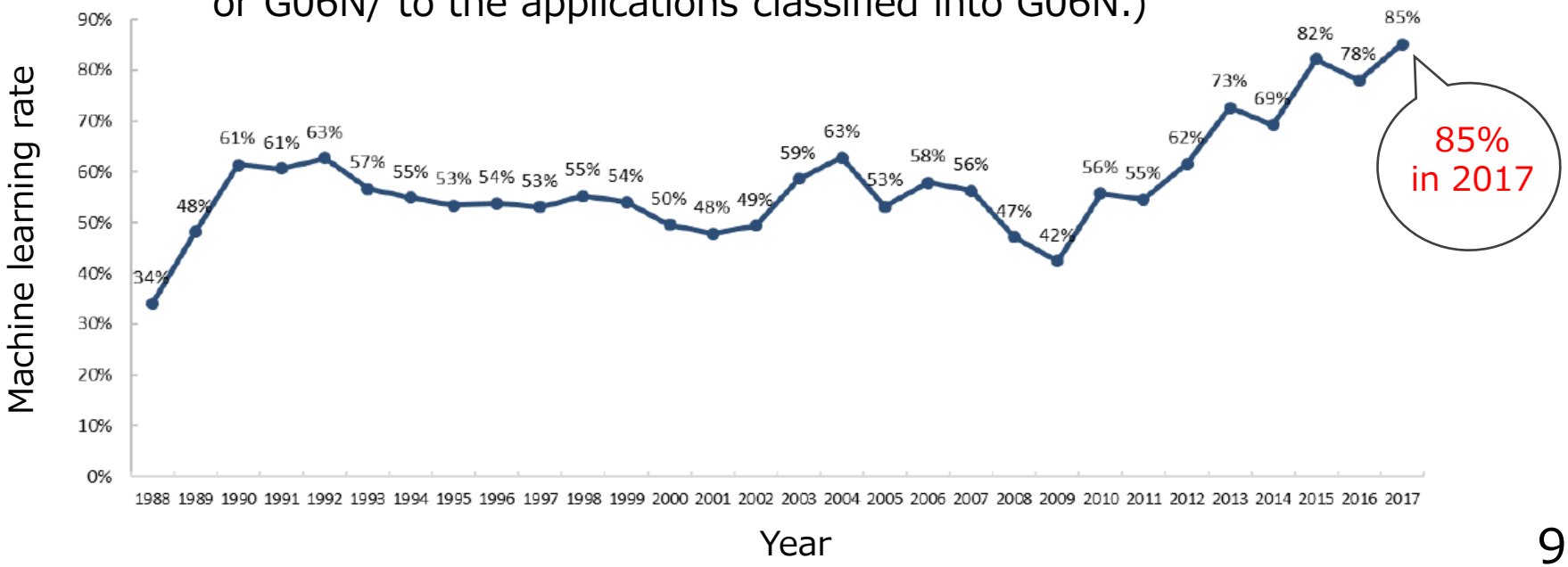


# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

- The transition in machine learning rates defined as the ratio of the applications with G06N3/02-3/10 or G06N20/ to the applications with G06N. The machine learning rate, which has been around 50 to 60% for long term, has risen from around 2013 and has reached 85% in 2017. Recent AI-related inventions are usually realized by machine learning.

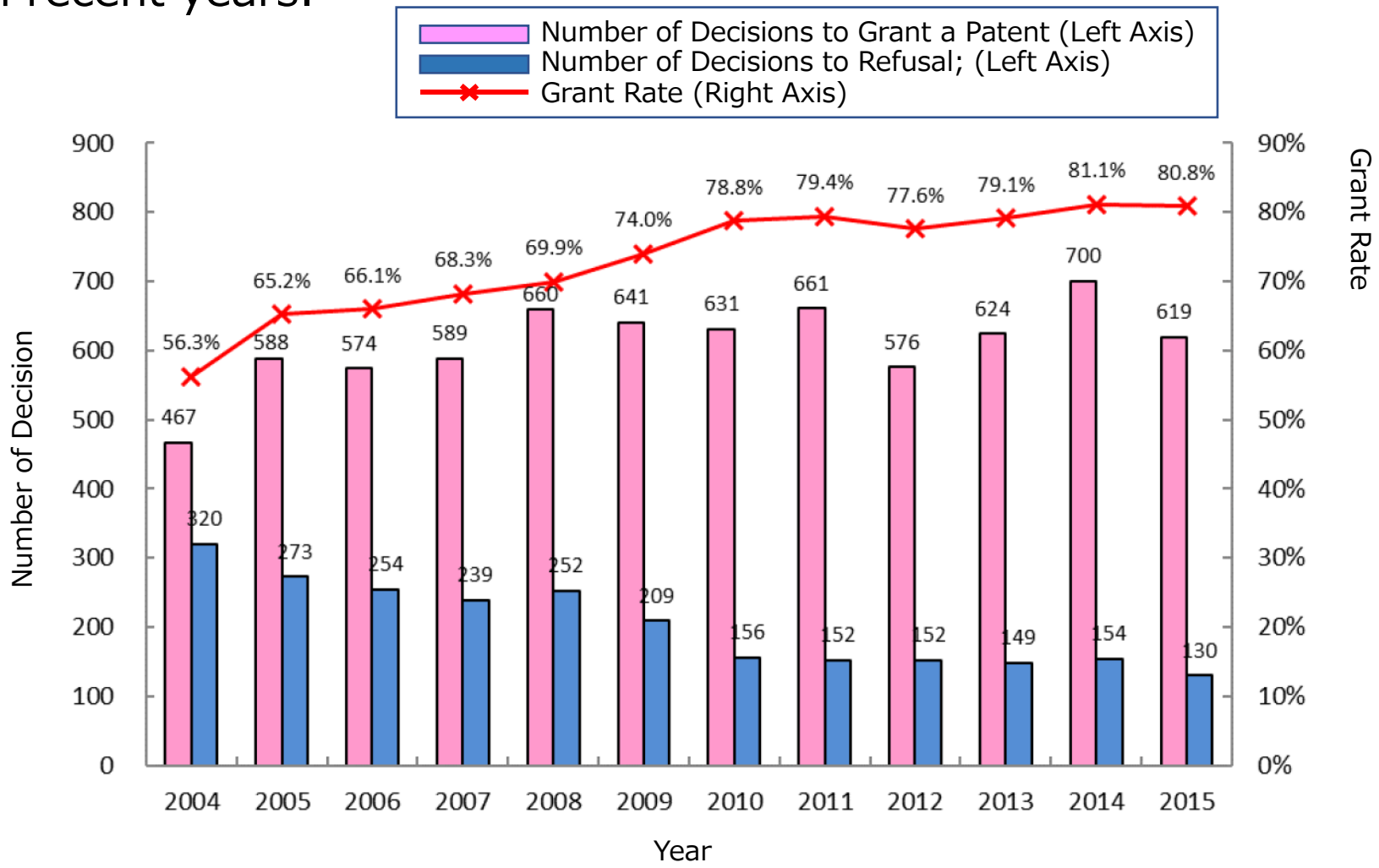
## The machine learning rate

(Rate of the applications classified into G06N3/02-3/10 or G06N/ to the applications classified into G06N.)



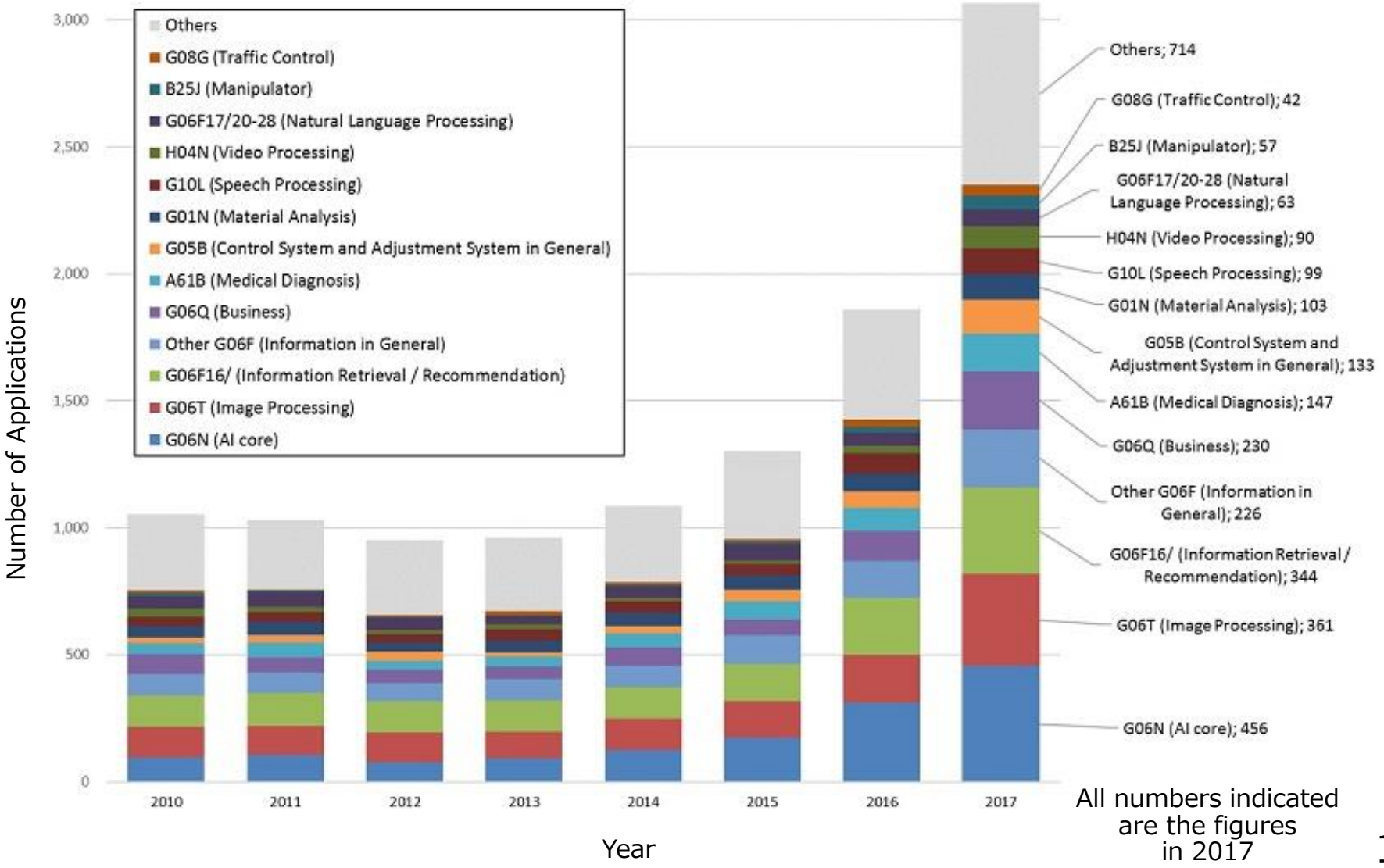
# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

- The grant rate for AI-related inventions has been rising year by year since 2004, and has been steady at around 80% in recent years.



# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

## Composition of main classification of AI-related invention

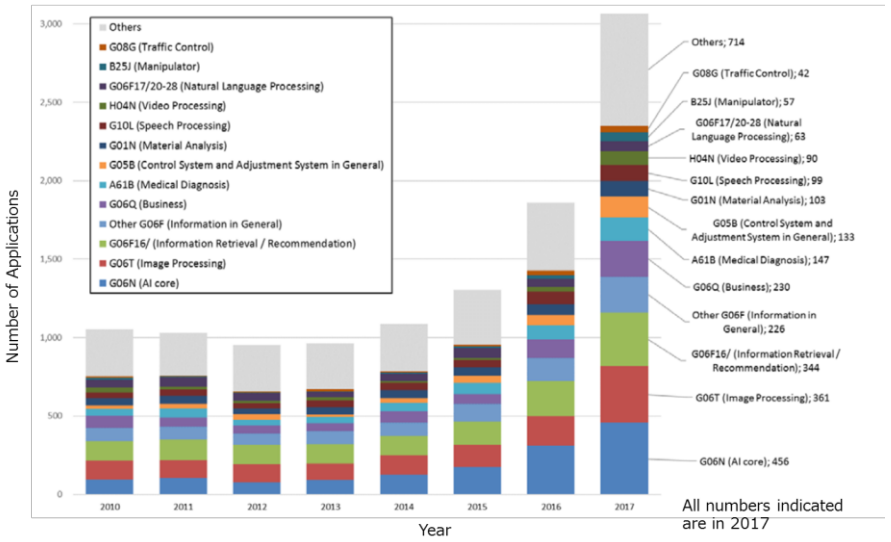



All numbers indicated are the figures in 2017

# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

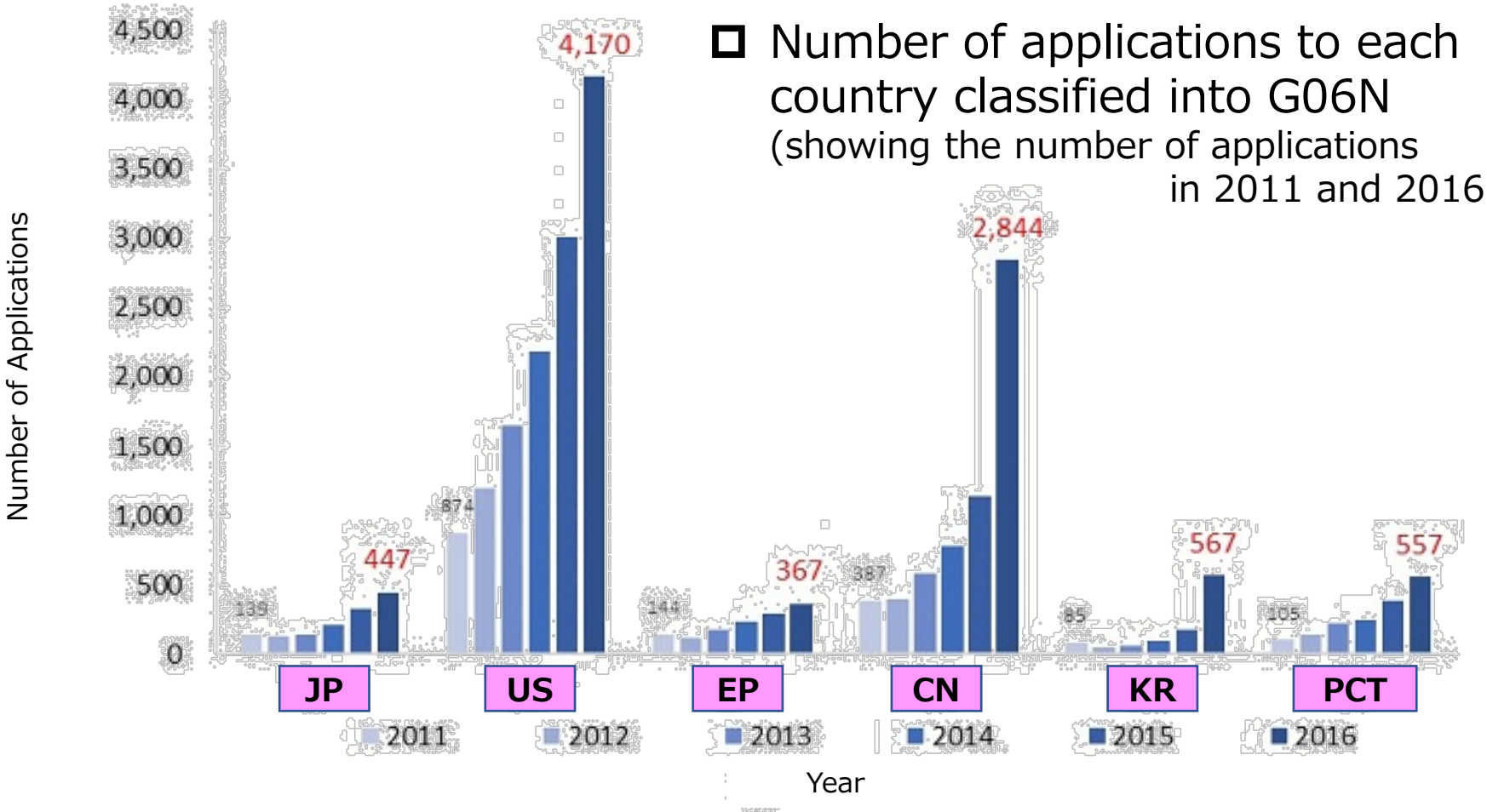
- It shows that G06T (image processing technology) and G06F16/ (information retrieval / recommendation; including G06F17/30 before FI revision) have been particularly major as main classifications assigned other than G06N.
- In addition, G06Q (business; including G06F17/60 before FI revision), A61B (medical diagnosis), G05B (control system and adjustment system in general), G01N (material analysis), G10L (speech processing), G06F17/20-28 (natural language processing / machine translation) and so on are also major AI-application area.
- Note that the scale of other G06F (information in general) is also large, including the major AI-application area such as G06F3/ (man machine interface) and G06F21/ (security).

Composition of main classification of AI-related invention



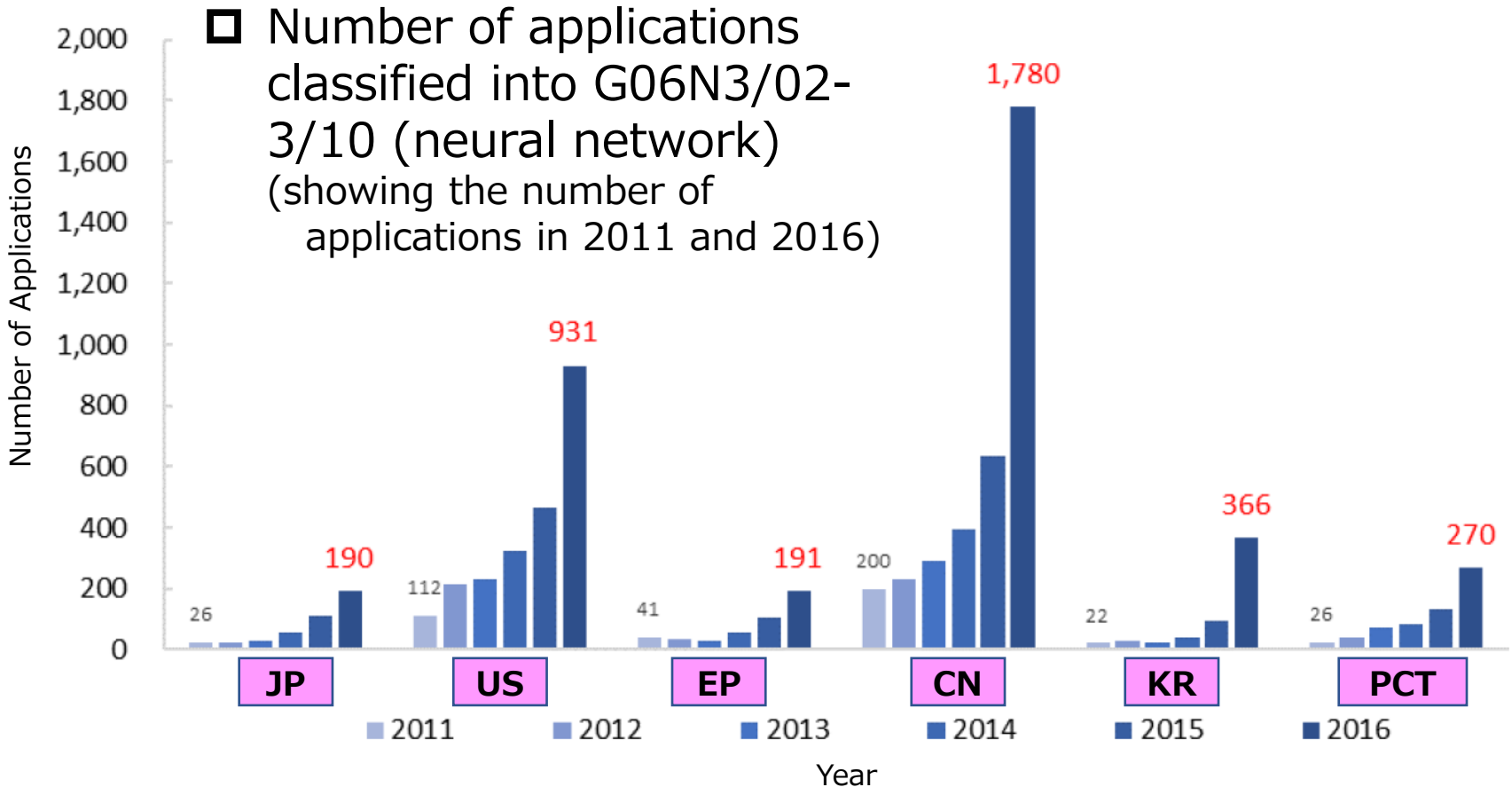
# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

- The bar chart below shows the number of national applications to the Five IP Offices and PCT classified into IPC: G06N. The major destinations of the increasing number of applications for AI-related technology are the US and China.




- Number of applications to each country classified into G06N (showing the number of applications in 2011 and 2016)

- Furthermore, as a trend of applications related to neural networks, the bar chart below shows the number of applications classified into IPC: G06N3/02-3/10 (neural network). The number of applications in China is higher than the US, and it is also on the rise worldwide.



- Issues to be considered for the three case examples:

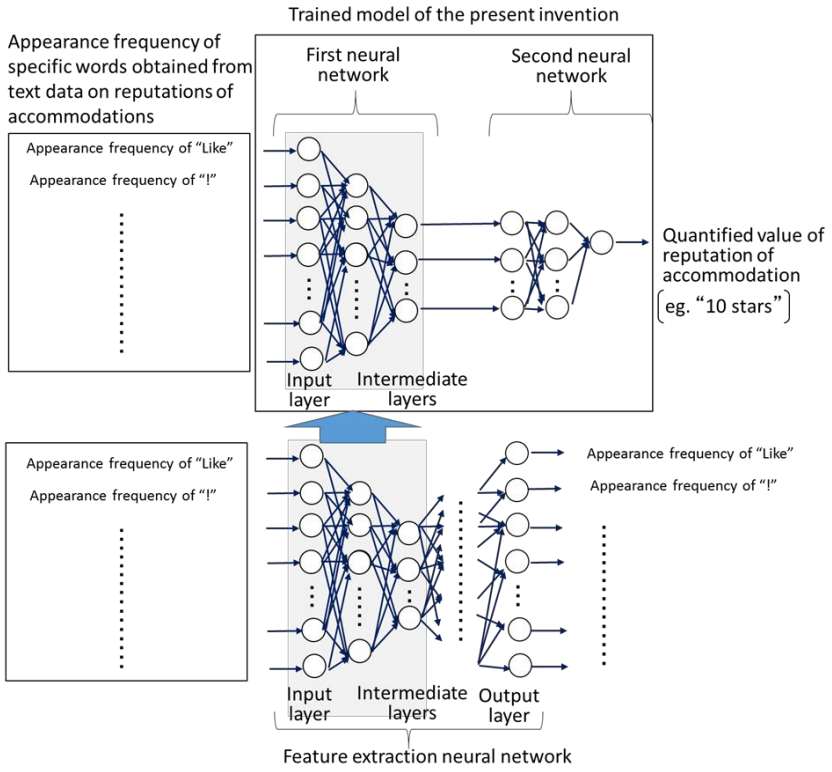
## ■ CASE EXAMPLE 1:

## Assessment of Eligibility of Patent

### "Trained Model for Analyzing Reputations of Accommodations"

*<ISSUES> Case Example 1 raises the issue to contemplate whether the AI-generated "trained model" is eligible for a patent, i.e. it should be defined as a statutory invention. In other words, it should be explored if your Office regards the trained model as a de facto "program." And, if so, we should like to clarify that your Office considers a "program" as such is patent-eligible.*

*Meanwhile, it should also be clarified what are required to be categorized as a "program" by your patent examination guidelines, e.g. a "program" should always be associated with hardware resources.*



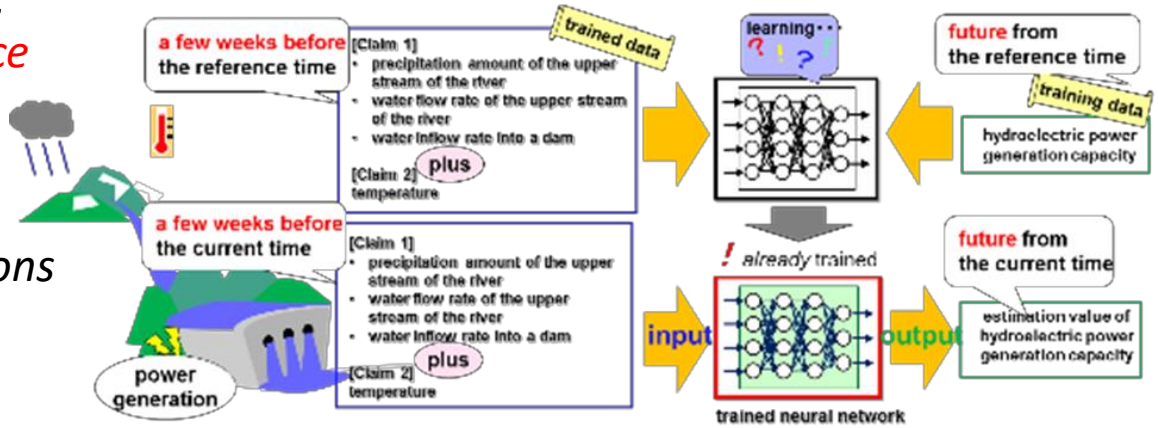
## ■ CASE EXAMPLE 2:

# Assessment of Inventive Step

## "Estimation of Hydroelectric Generating Capacity"

*<ISSUES> Case Example 2 raises the issue to contemplate whether your Office would find it as an indicator of the inventive step that a part of the input data to the neural network involves a new parameter which has not been described in the prior art. In other words, it should be explored if your Office accepts the inventive step in the case where the new input data to the neural network (which is deemed as a difference between the claim in question and the prior art) does not have an interrelation with other input data in light of common general technical knowledge, or is not easily predictable one.*

*Furthermore, a discussion may be brought up concerning the assessment of the inventive step by your Office, i.e. whether or not your Office accepts the inventive step where both Cited Invention and the well-known art are identical in their operations or functions, so that it would provide a premise with the motivation.*



## ■ CASE EXAMPLE 3:

# Assessment of Description Requirements

## "Business Plan Design Apparatus"

*<ISSUES> Case Example 3 raises the issue to contemplate how much the applicant should detail the description, in particular, the enablement of the claim matters in which involves usage of the trained model.*

*With regard to the enablement requirement, it is understood that a prediction algorithm (i.e. an algorithm which predicts output by observing input) would not concretely be presented in the light of the trained model (prediction model) generated by the machine learning. In other words, Case Example 3 encourages the discussion on how much the description requirements are necessary to enable for your Office to predictably recognize the existence of correlation, based on common general technical knowledge, between inputs and outputs.*

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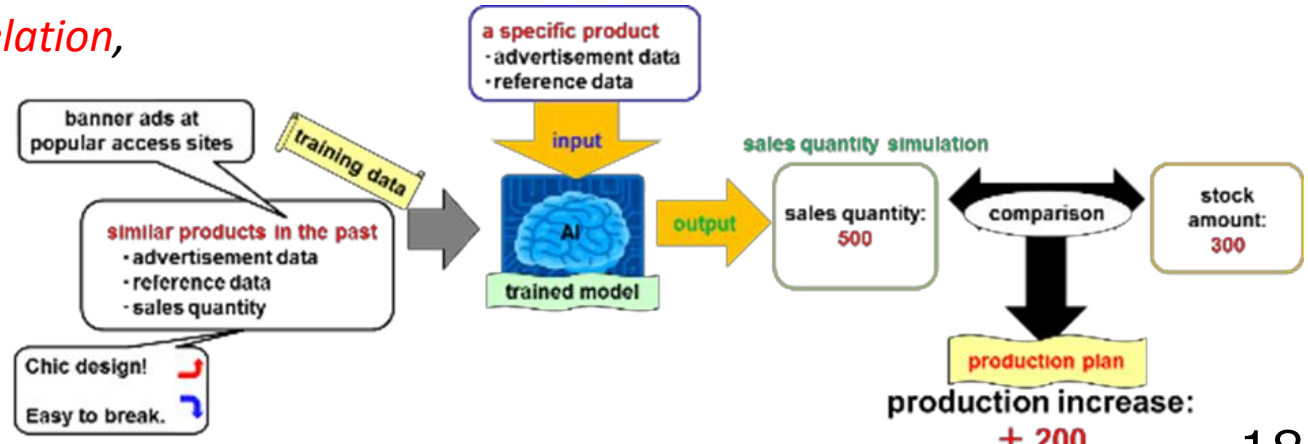

## AI-related FI

| AI-related FI | Description | <Ref.> Description of upper subclass |
|---|---|---|
| A61B1/045,614 | conducting machine learning, data mining or statistical analysis, e.g. extracting lesion parts by using AI; extracting lesion parts by cluster analysis | A61B：DIAGNOSIS; SURGERY; IDENTIFICATION |
| B23Q15/00,301@C | Program creation by knowledge accumulation and inference | B23Q：DETAILS, COMPONENTS, OR ACCESSORIES FOR MACHINE TOOLS |
| B60T8/174 | characterized by using special control logic, e.g. fuzzy logic | B60T：VEHICLE BRAKE CONTROL SYSTEMS OR PARTS THEREOF; BRAKE CONTROL SYSTEMS OR PARTS THEREOF, IN GENERAL; ARRANGEMENT OF BRAKING ELEMENTS ON VEHICLES IN GENERAL; PORTABLE DEVICES FOR PREVENTING UNWANTED MOVEMENT OF VEHICLES; VEHICLE MODIFICATIONS TO FACILITATE COOLING OF BRAKES |
| F02D41/14,310@H | Learning control | F02D：CONTROLLING COMBUSTION ENGINES |
| F24H1/10,302@N | Fuzzy control(Including neural net) | F24H：FLUID HEATERS, e.g. WATER OR AIR HEATERS, HAVING HEAT-GENERATING MEANS, IN GENERAL |
| G05B13/02@L | Learning control | G05B：CONTROL OR REGULATING SYSTEMS IN GENERAL; FUNCTIONAL ELEMENTS OF SUCH SYSTEMS; MONITORING OR TESTING ARRANGEMENTS FOR SUCH SYSTEMS OR ELEMENTS |
| G05B13/02@M | using AI and inference method | |
| G05B13/02@N | Fuzzy control | |

# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

| AI-related FI | Description | <Ref.> Description of upper subclass |
|---|---|---|
| G05B19/4155@V | inferencing or learning | G05B：CONTROL OR REGULATING SYSTEMS IN GENERAL; FUNCTIONAL ELEMENTS OF SUCH SYSTEMS; MONITORING OR TESTING ARRANGEMENTS FOR SUCH SYSTEMS OR ELEMENTS |
| G06F7/02,630 | adaptation, e.g. self study | G06F：ELECTRIC DIGITAL DATA PROCESSING |
| G06F11/14,676 | in neural net | |
| G06F11/22,657 | using expert system | |
| G06F11/22,663 | using neural network | |
| G06F16/36 | Creation of semantic tools, e.g. ontology or thesauri | |
| G06F16/90,100 | knowledge database | |
| G06F17/22,682 | automatically learn conversion rule, e.g. learning by examples | |
| G06F17/27,615 | statistical method | |
| G06F17/28,618 | statistical method, e.g. probability model | |
| G06F17/30,180@A | knowledge database | |
| G06F17/30,180@B | expert system | |

# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

| AI-related FI | Description | <Ref.> Description of upper subclass |
|---|---|---|
| G06F17/30,180@C | fuzzy searching | G06F：ELECTRIC DIGITAL DATA PROCESSING |
| G06F17/50,604@D | using AI, inference | |
| G06K7/14,082 | step using fuzzy logic solution or solution taking natural phenomenon as model such as neural network, genetic algorithm, simulated annealing | G06K：RECOGNITION OF DATA; PRESENTATION OF DATA; RECORD CARRIERS; HANDLING RECORD CARRIERS |
| G06T1/40 | Neural networks | G06T：G06T IMAGE DATA PROCESSING OR GENERATION, IN GENERAL |
| G06T3/40,725 | uses neural network | |
| G06T7/00,350@B | recognition by learning algorithm | |
| G06T7/00,350@C | using neural network | |
| G06T7/00,350@D | by heriditical algorithm | |
| G06T7/143 | involving probabilistic approaches, e.g. Markov random field [MRF] modelling | |
| G06T9/00,200 | using neural networks | |
| G08B31/00@A | for example, analyzing the cause of anomaly by the use of reasoning or fuzzy theory, or showing the measures and methods | G08B：SIGNALLING OR CALLING SYSTEMS; ORDER TELEGRAPHS; ALARM SYSTEMS |

# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

| AI-related FI | Description | <Ref.> Description of upper subclass |
|---|---|---|
| G10L15/10,300@J | characterized by calculation of the degree of resemblance or the distance by using the fuzzy theory or the chaos theory | G10L：SPEECH ANALYSIS OR SYNTHESIS; SPEECH RECOGNITION; SPEECH OR VOICE PROCESSING; SPEECH OR AUDIO CODING OR DECODING |
| G10L15/14 | using statistical models, e.g. Hidden Markov Models [HMM] (G10L 15/18takes precedence) | |
| G10L15/16 | using artificial neural networks | |
| G10L17/10 | Multimodal systems, i.e. based on the integration of multiple recognition engines or fusion of expert systems | |
| G10L17/16 | Hidden Markov models [HMMs] | |
| G10L17/18 | Artificial neural networks; Connectionist approaches | |
| G10L25/30 | using neural networks | |
| G10L25/33 | using fuzzy logic | |
| G10L25/36 | using chaos theory | |
| G10L25/39 | using genetic algorithms | |

# Research of Patent Examination Practice on Emerging Technologies in the ASEAN Member States

| AI-related FI | Description | <Ref.> Description of upper subclass |
|---|---|---|
| G16B40/00 | ICT specially adapted for biostatistics; ICT specially adapted for bioinformatics-related machine learning or data mining, e.g. knowledge discovery or pattern finding | G16B：BIOINFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR GENETIC OR PROTEIN-RELATED DATA PROCESSING IN COMPUTATIONAL MOLECULAR BIOLOGY |
| G16C20/70 | Machine learning, data mining or chemometrics | G16C：COMPUTATIONAL CHEMISTRY; CHEMOINFORMATICS; COMPUTATIONAL MATERIALS SCIENCE |
| G16H50/20 | for computer-aided diagnosis, e.g. based on medical expert systems | G16H：HEALTHCARE INFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR THE HANDLING OR PROCESSING OF MEDICAL OR HEALTHCARE DATA |
| H01M8/04992 | characterized by the implementation of mathematical or computational algorithms, e.g. feedback control loops, fuzzy logic, neural networks or artificial intelligence | H01M：PROCESSES OR MEANS, e.g. BATTERIES, FOR THE DIRECT CONVERSION OF CHEMICAL ENERGY INTO ELECTRICAL ENERGY |

ERIA Full Report Submitted
to Japan-ASEAN Heads of IP Office Meeting 2021

ERIA Research Project 2020

# Research on Patent Examination Practices on Emerging Technologies in the ASEAN Member States

Requested by ASEAN IPOs and JPO

**Economic Research Institute for ASEAN and East Asia**

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Director General for Research
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In cooperation with
Shobayashi International Patent & Trademark Office

Ver.9

- **Table of Contents :**


# 1. Introduction

- Recent trend on the number of patent applications filed on AI inventions
- Advantages of mutual understanding on patent examination practices
  - Advance work-sharing and harmonization among AMS IPOs.
  - Boost innovation and investment in AMS.

# Research on Patent Examination Practices on Emerging Technologies in the ASEAN Member States


## 2. Purposes and Methods

## ◆ Purposes

- Analyze patent examination guidelines developed by AMS IPOs.
- Examine three AI cases prepared by the JPO based on the AMS IPOs' examination practices.

## ◆ Methods

Step 1: Questionnaires

Step 2: Interviews


# 3. Summary of results

# ◆ Status of Patent Examination Guidelines:

| | ID | MY | PH | SG | TH | VN | BN | KH | LA | MM |
|---|---|---|---|---|---|---|---|---|---|---|
| Existence | Y | Y | Y | Y | Y | Y | N | N | Y | N |
| Publicly Available | N | Y | Y | Y | Y | Y | N | N | N | N |
| Separate parts, for AI, CS, BM and IoT | Y | N | Y | N | N | Y | N | N | N | N |
| Case Examples | Y | Y | Y | N | N | N | N | N | N | N |

## ◆ Number of AI applications:

| | ID | MY | PH | SG | TH | VN | BN | KH | LA | MM |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of AI applications (as of 2020) | 61 (21) | 26 (16) | 15 (4) | N/A | 32 | 5 | N/A | N/A | N/A | N/A |

*Numbers of application which have already been examined are in the brackets.

## ◆ Problems:

- Lack of examiners who are familiar with AI (ID/MY/VN/TH/KH/LA/MM)
- Difficulties to assess patent eligibility and description requirements (PH)
- Much time and effort required to learn AI technologies (SG)

# ◆ Examination results on three cases

| | ID | MY | PH | SG | TH | VN | BN | KH | LA | MM |
|---|---|---|---|---|---|---|---|---|---|---|
| Case 1 Eligibility | B | D | D | C | B | C | | | B | B |
| Case 2 Inventive step | A | A | A | C | C | A | | | A | A |
| Case 3 Description Requirement | | B | A | B | B | B | | | A | A |

* ID has not set up details about description requirements.
* BN/KH would like to reserve their judgements

*Same* A B C D *different*


# 4. Conclusion

- ✓ This research clarified the similarities and differences in patent examination practices at IPOs regarding AI applications.
- ✓ The results of this research will serve as a basis for discussions at patent expert meetings aimed at mutually understanding and harmonizing patent examination practices.

- Thank you for cooperating in this ERIA research.

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Mrs. Dk. Siti Nurul Adibah Pg Rosli
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- Thank you for cooperating in this ERIA research.

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Mr. Le Van Viet
Official, International Cooperation Division

# Thank you for listening

Economic Research Institute
for ASEAN and East Asia

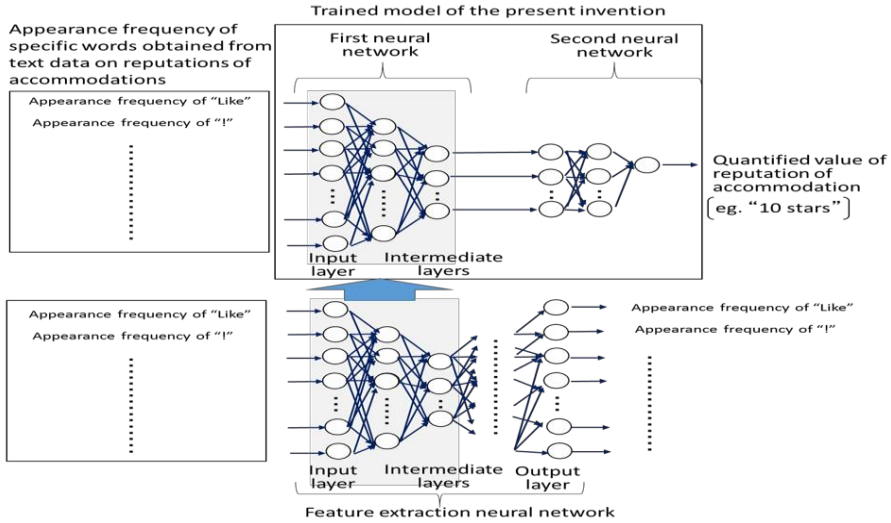
SHOBAYASHI INTERNATIONAL
PATENT & TRADEMARK OFFICE

# Annex

# Case 1:

"Trained Model for Analyzing Reputations of Accommodations"
ISSUE: **Assessment of Eligibility of Patent**

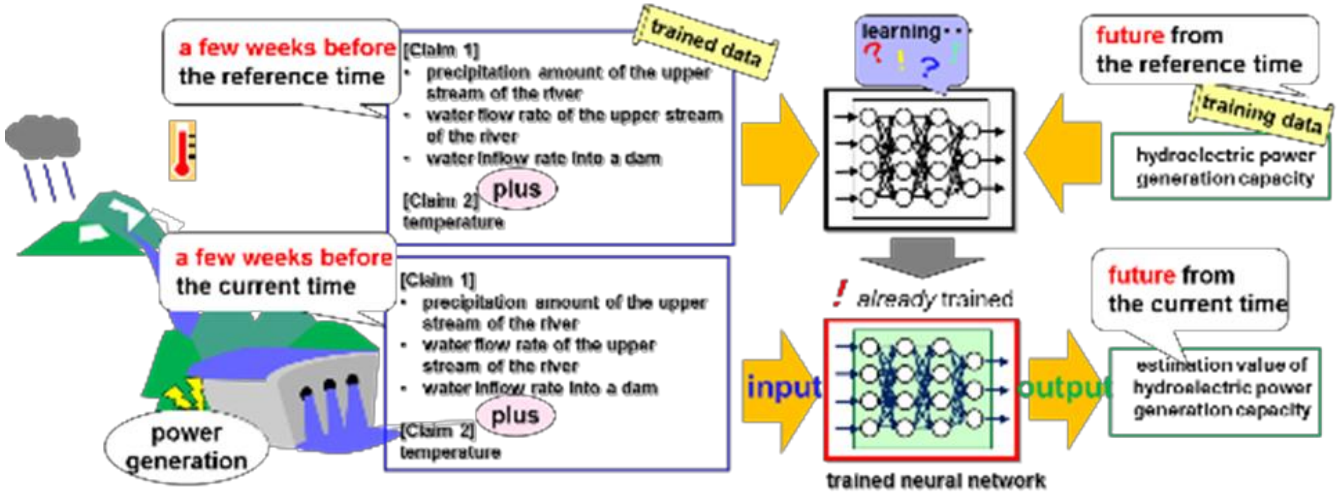
- ✓ *To contemplate whether the AI-generated "trained model" is eligible for a patent or not.*
  *In other words, to see if your office regards the trained model as a de facto "program."*
- ✓ *To clarify what are required to be categorized as "programs" based on your patent examination guidelines, e.g., a "program" should always be associated with hardware resources.*



- **Case 2**:

"Estimation of Hydroelectric Generating Capacity"
ISSUE: **Assessment of Inventive Step**

- ✓ *To contemplate whether the new input data (a new parameter) to the neural network may be considered as an indicator of the inventive step.*
- ✓ *To clarify whether your office considers the inventive step to exist when both the cited invention and the well-known art are identical in their operations or functions.*




ANNEX-2

- **Case 3**:

"Business Plan Design Apparatus"
ISSUE: **Assessment of Description Requirements**

- ✓ *To contemplate how much the applicant should describe the description in detail, in particular, whether the enablement of the claim matters when it involves usage of the trained model.*
- ✓ *To clarify how much the description requirements are necessary to enable your office to recognize the existence of correlation.*