Patent Protection/Examination of Emerging Technologies

JPO
JAPAN PATENT OFFICE

Trend

Guideline

Classification

Team

Organization of the JPO

Japan Patent Office

Akira MATSUNAGA
Commissioner
2019.7－

Personnel : 2,792
  Examiners
    Patent : 1682
    Design : 48
    Trademark : 140
Administrative judges : 383

General Affairs Dept.

Trademark and Customer Relations Dept.

Patent (Optics) and Design Examination Dept.

Patent Examination Dept. (Mechanics)
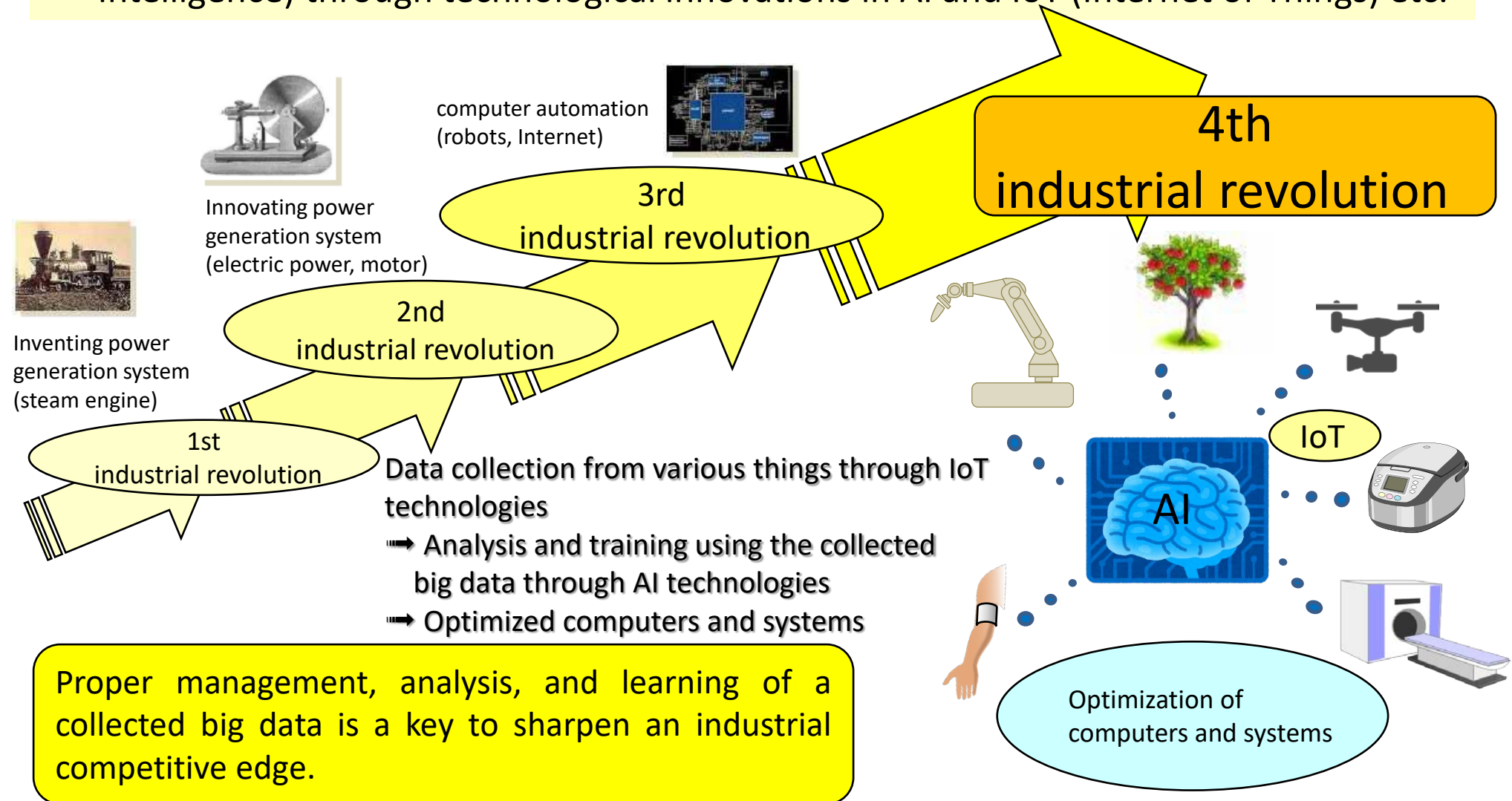
Patent Examination Dept. (Chemistry)

Patent Examination Dept. (Electronics)

Trial and Appeal Dept.

Industry 4.0 with AI and IoT technologies etc.

- The fourth industrial revolution is expected with the use of Big Data and AI (Artificial Intelligence) through technological innovations in AI and IoT (Internet of Things) etc.
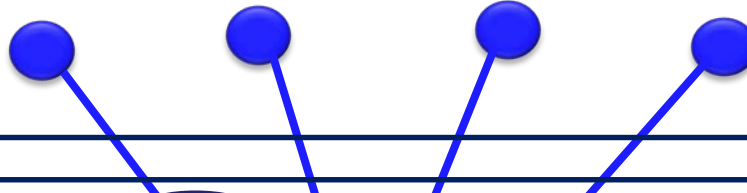
computer automation (robots, Internet)

Innovating power generation system (electric power, motor)

Inventing power generation system (steam engine)

3rd industrial revolution

4th industrial revolution

2nd industrial revolution

1st industrial revolution

Data collection from various things through IoT technologies
➡ Analysis and training using the collected big data through AI technologies
➡ Optimized computers and systems

AI

IoT

Optimization of computers and systems

Proper management, analysis, and learning of a collected big data is a key to sharpen an industrial competitive edge.

IoT related technologies

Sensing data

(1) **Collecting**

· D**ata management**
· Data structure
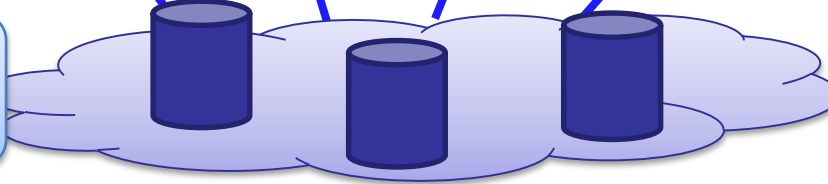
(2) **Managing**

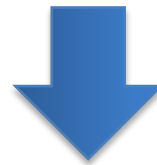· **Neural network**
· **Deep learning**
· Trained-model
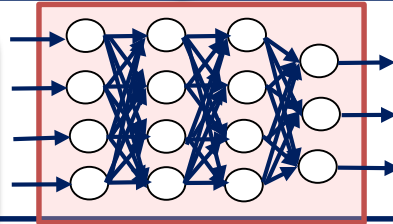
(3) **Analyzing and training**
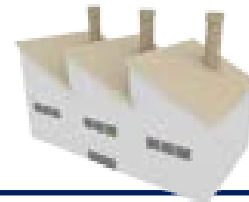
(4) **Utilizing**

Scope of AI inventions

Data

Machine learning

Trained model

used as software

Q1. [image of cat]

Q2. [image of tiger]

Unknown data

A1. Cat

A2. Tiger
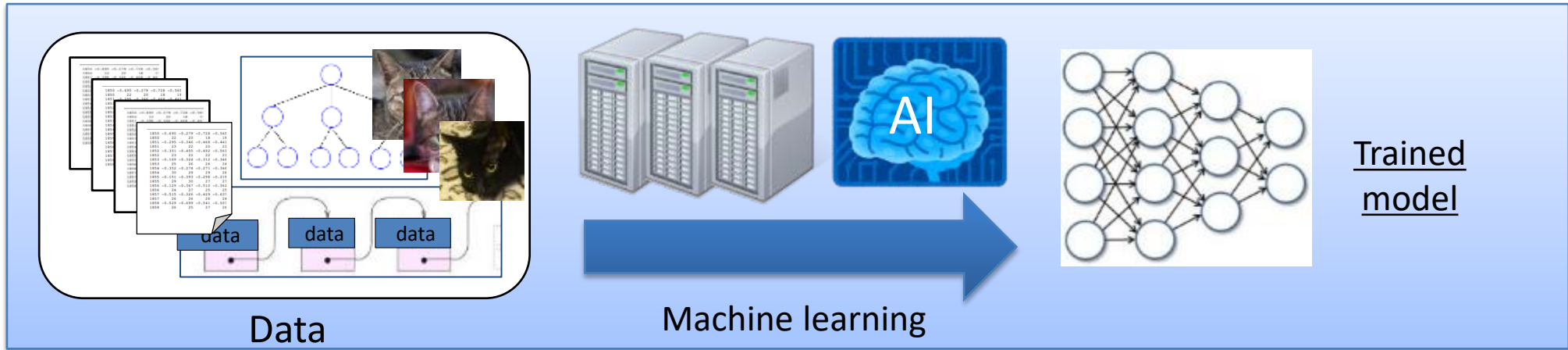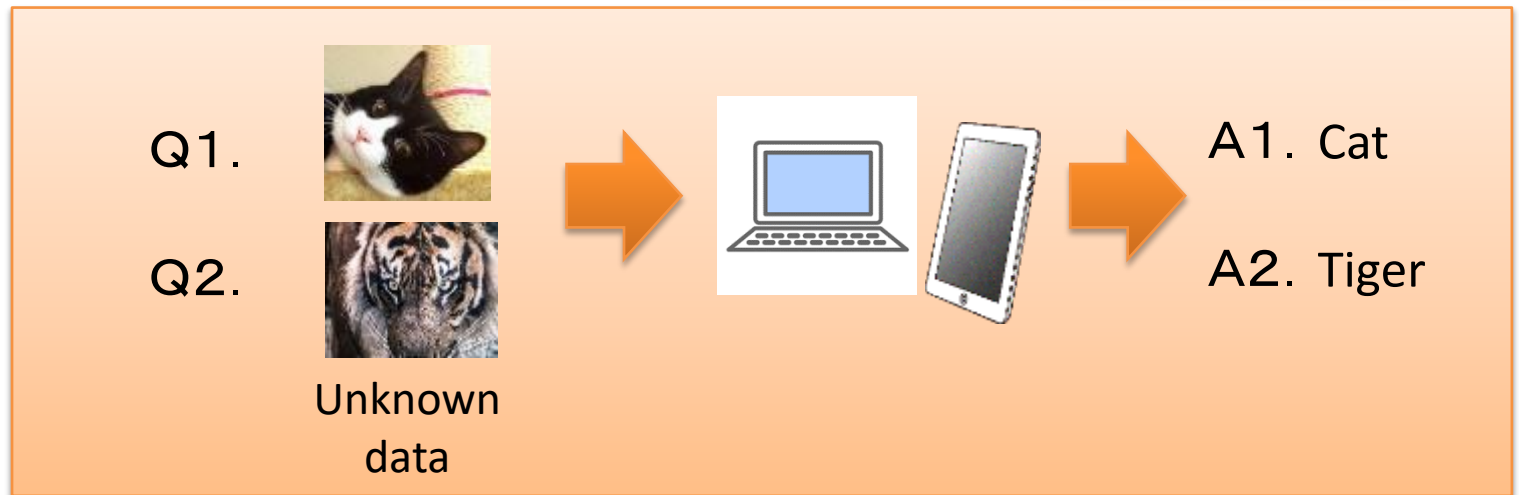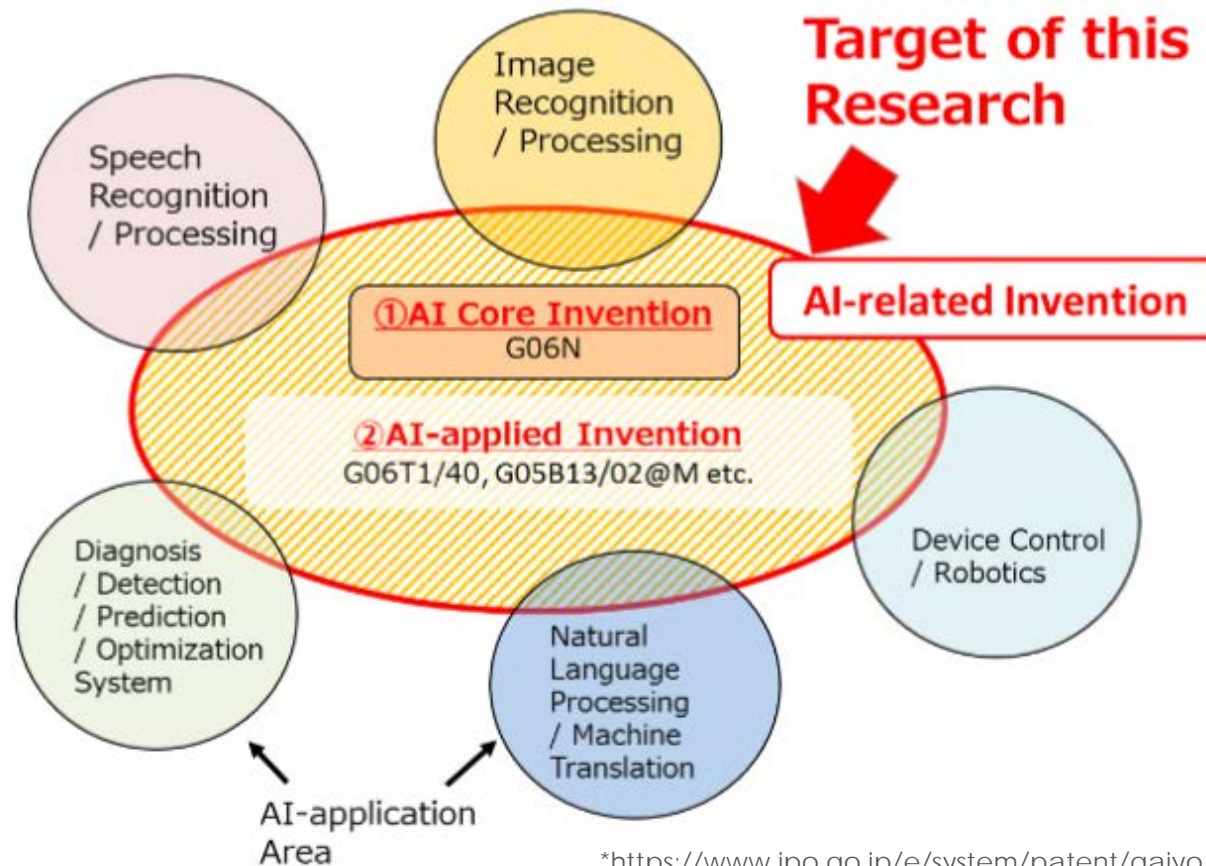
Report on Recent Trends in AI-related Inventions (Published in July 2019)

- Define "AI core invention" and "AI-applied invention" as "AI-related invention."
- Extract around 40,000 applications(filed between 1988-2017) by using patent classifications and keywords.
- Detailed research method is opened in the report*.

Target of this Research

Image Recognition / Processing

Speech Recognition / Processing

AI-related Invention

①**AI Core Invention**
G06N

②**AI-applied Invention**
G06T1/40, G05B13/02@M etc.

Diagnosis / Detection / Prediction / Optimization System

Device Control / Robotics

Natural Language Processing / Machine Translation

AI-application Area

*https://www.jpo.go.jp/e/system/patent/gaiyo/ai/ai_shutsugan_chosa.html

Trends in Patent Applications
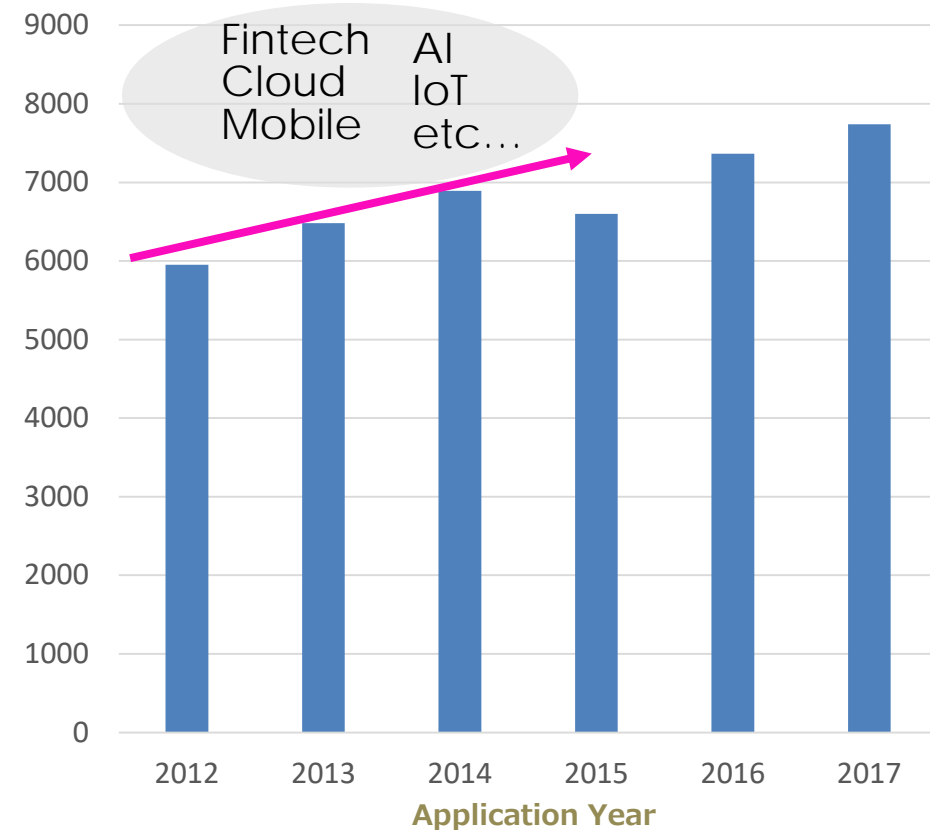## （AI , Business related Invention/Japan）

Number of Applications
(AI -related Invention/Japan）

Fivefold Increase!

2012 2013 2014 2015 2016 2017
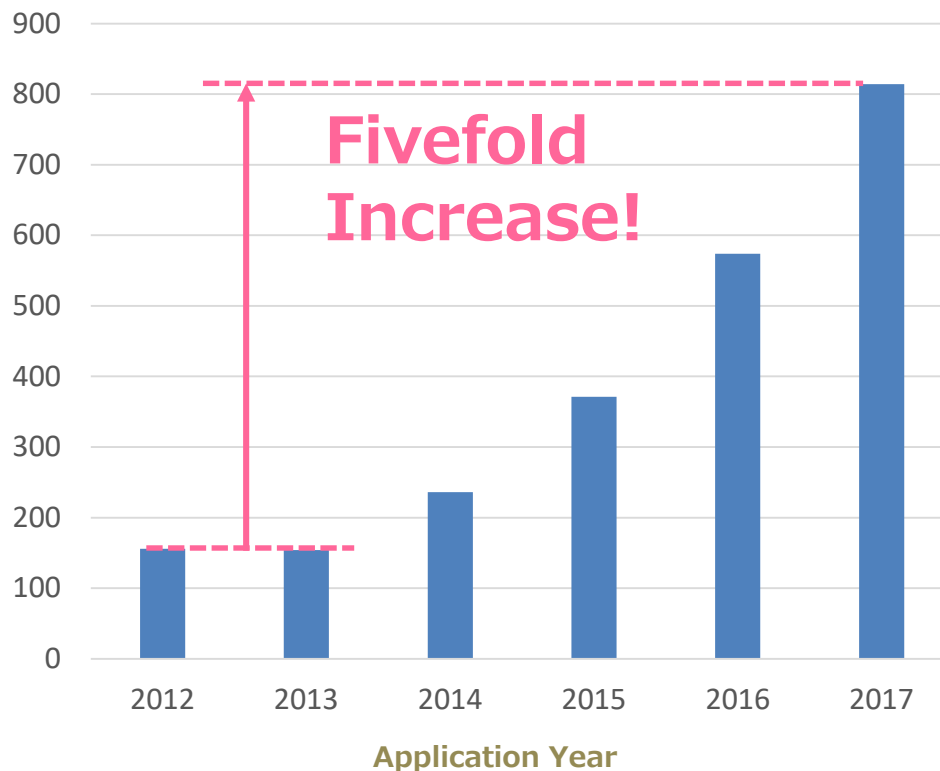
Application Year

Number of Applications
(Business -related Invention/Japan）

Fintech
Cloud
Mobile

AI
IoT
etc…

2012 2013 2014 2015 2016 2017
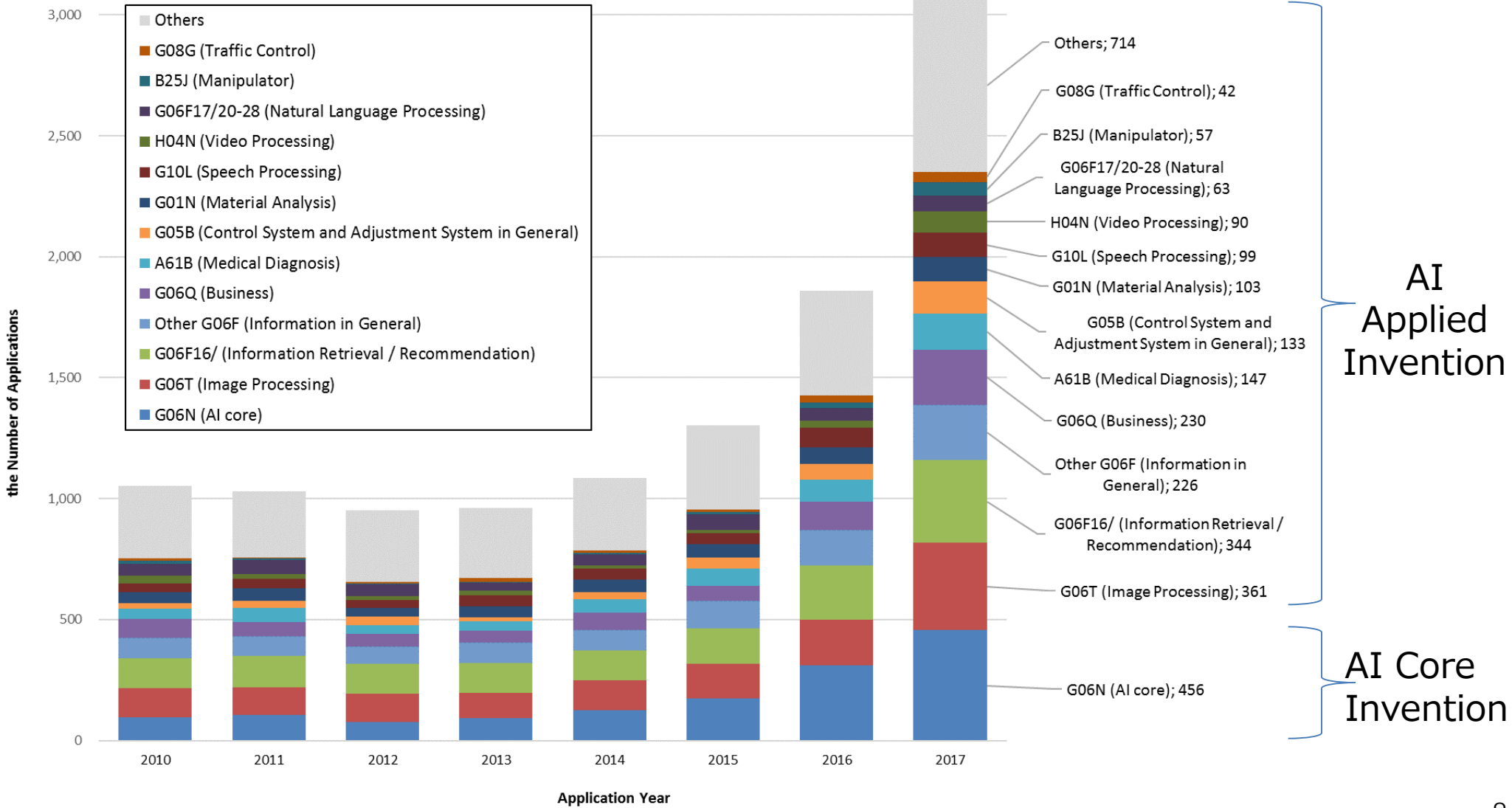
Application Year

※The number of patent applications with IPC G06F 15/18 or G06N is counted as AI-related patent applications.
※The number of patent applications with IPC G06Q is counted as Business-related applications.

Trends in Patent Applications (AI , Business related Invention/Japan)

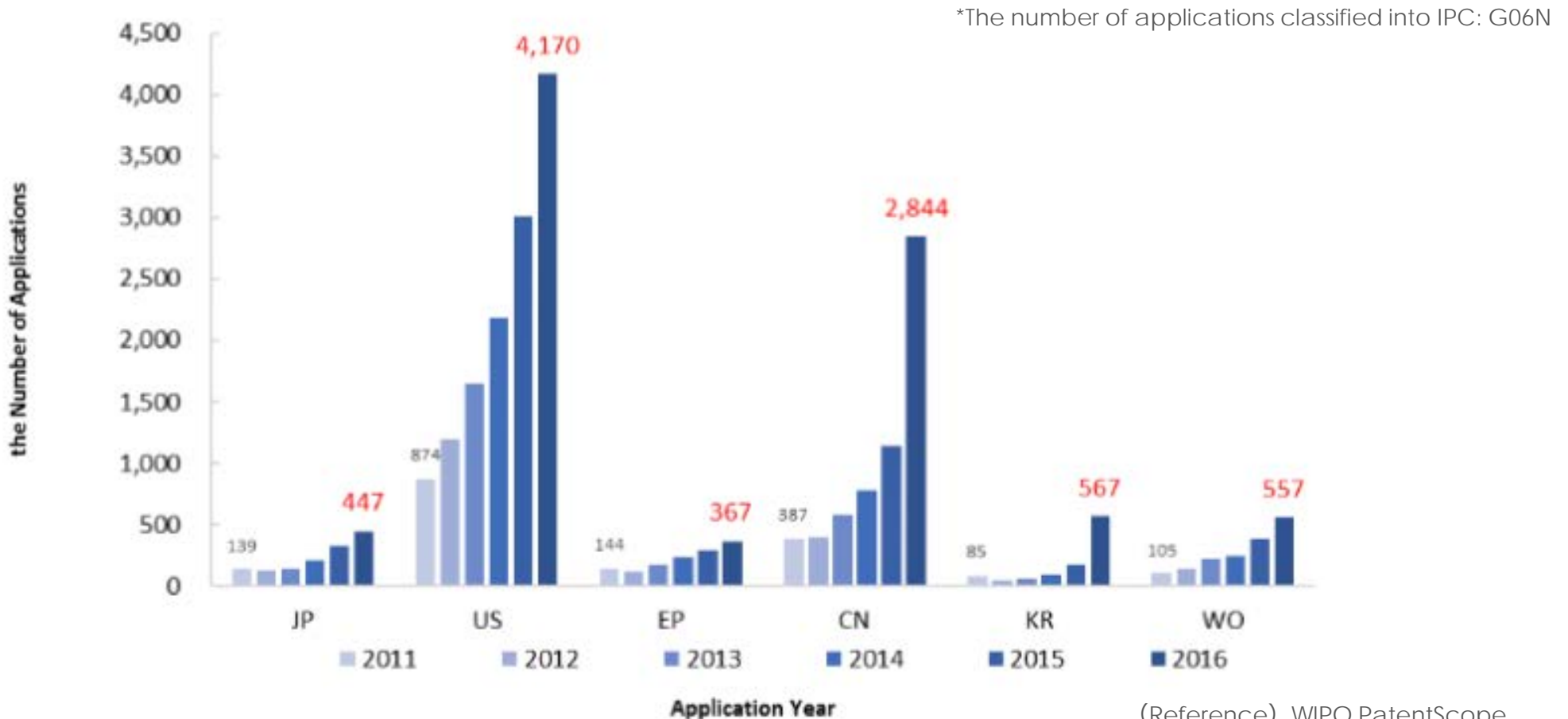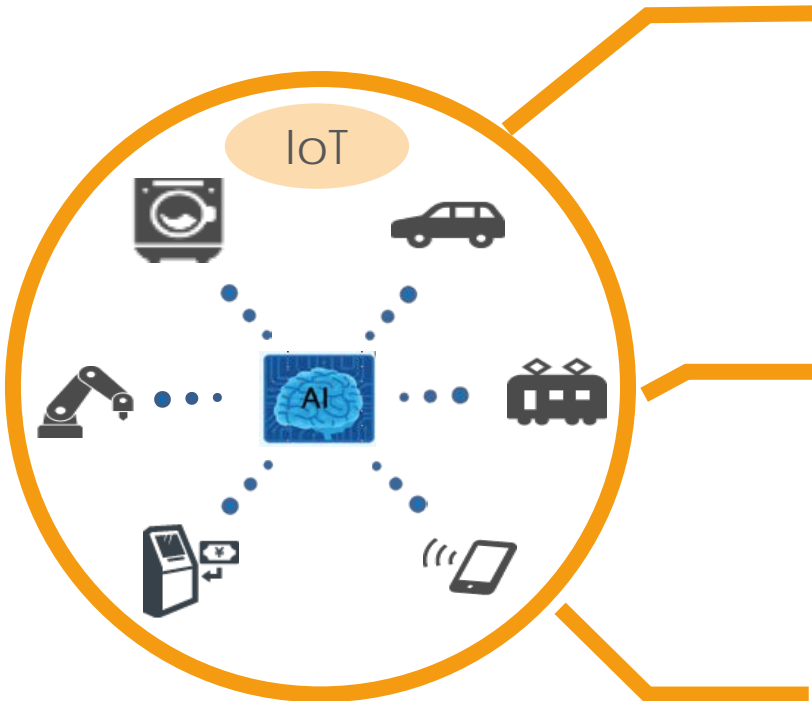- The number of applications for AI-related technology* has been increasing in each country.
- The United States and China are the major application destinations in the world.

*The number of applications classified into IPC: G06N

(Reference) WIPO PatentScope

To obtain patents on **AI/IoT Technologies**

IoT

AI

New Case Examples for AI and IoT*

Clear and easy-to-understand examination practice

* 23 case examples were added in 2016 and 2017.
New AI-related case examples were added in Jan., 2019.

Cross-sectoral Examination team for IoT

Reliable examination in all areas of industry

New Patent Classification on IoT (ZIT)

Better access to Patent Information

Quick response to new trends
Guidelines × Team × Information

AI/IoT-related measures by JPO

Patent Examination Guidelines / Handbook

Added case examples of AI/IoT-related inventions (Sep. 2016, Mar. 2017)

Clarification of examination guidelines for computer software-related inventions (Apr. 2018)

Invited public comments on AI-related inventions (Oct. 2018-Nov. 2018)

Added more case examples of AI-related inventions (30 Jan. 2019)

AI/IoT-related measures by JPO

- Eligibility / patent-eligible subject matter

- Description requirement

- Inventive step

Publishing Case Examples on IoT Related Technologies

IoT related technologies

＜Corresponding Case Examples＞

(1)Collecting

Sugar Content Data of Apples(Eligibility for Patent)

(2)Managing

Tree-structured Area Management Data (Eligibility for Patent, Inventive Step)

(3)Analyzing and training

Trained Model for Analyzing Reputation of Accommodations (Eligibility for Patent)
Quality Management Program of Manufacturing Lines (Inventive Step)

(4)Utilizing

・System and Method of Allocating Unmanned Autonomous Vehicle (Eligibility for Patent)
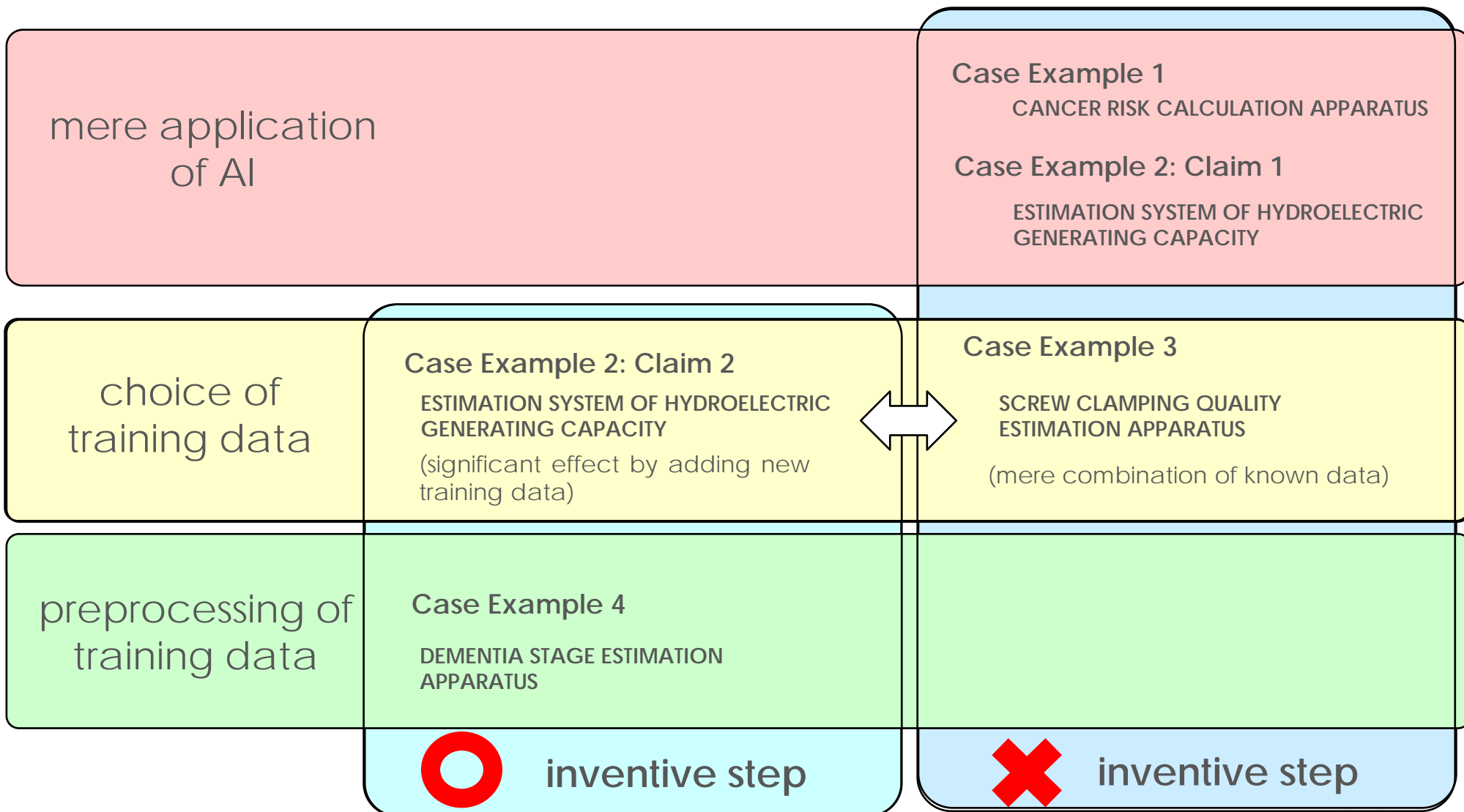
・Heavy Rain Point Specifying System (Inventive Step)

	⭕ **Description requirement satisfied**	❌ **Description requirement NOT satisfied**
Inventions relating to AI application in various field Existence of relation b/w data is …		**Case Example 1** **SUGAR CONTENT ESTIMATION SYSTEM** neither common technical knowledge, statistical information nor evaluation result of an actual AI model is shown to prove the correlation
evident	**Case Examples 2 and 3** **Yes** **BUSINESS PLAN DESIGN APPARATUS** **AUTONOMOUS VEHICLE**	
backed by statistical information	**Case Example 4: Claim 2** **Yes** **BODY WEIGHT ESTIMATION SYSTEM**	**Case Example 4: Claim 1** **No** **BODY WEIGHT ESTIMATION SYSTEM**
backed by experimental evaluation of trained AI model	**Case Example 5: Claim 2** **Yes** **METHOD FOR ESTIMATING ALLERGY INCIDENCE RATE OF TEST SUBSTANCE**	**Case Example 5: Claim 1** **No** **METHOD FOR ESTIMATING ALLERGY INCIDENCE RATE OF TEST SUBSTANCE**
Claiming a material inferred by AI to have certain properties		**Case Example 6** **ANAEROBIC ADHESIVE COMPOSITION** Only evidence shown is inference by AI (Suppose it is not a common technical knowledge at the time of filing that AI inference can be a substitute for experiment using actual product)

mere application of AI		**Case Example 1** CANCER RISK CALCULATION APPARATUS **Case Example 2: Claim 1** ESTIMATION SYSTEM OF HYDROELECTRIC GENERATING CAPACITY
choice of training data	**Case Example 2: Claim 2** ESTIMATION SYSTEM OF HYDROELECTRIC GENERATING CAPACITY (significant effect by adding new training data)	**Case Example 3** SCREW CLAMPING QUALITY ESTIMATION APPARATUS (mere combination of known data)
preprocessing of training data	**Case Example 4** DEMENTIA STAGE ESTIMATION APPARATUS	
	⭕ **inventive step**	❌ **inventive step**

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Case Examples for Patent-Eligibility

System and Method of Allocating Unmanned Autonomous Vehicle

(2) Acquiring a face image

Storing unit

Vehicle allocation server

User ID：Face image

(3) Face image of a user & Vehicle allocation position

(1) Request for vehicle allocation

(5) face authentication

(4) autonomous driving up to the vehicle allocation position

Unmanned autonomous vehicle

Portable terminal (a person who desires vehicle allocation)
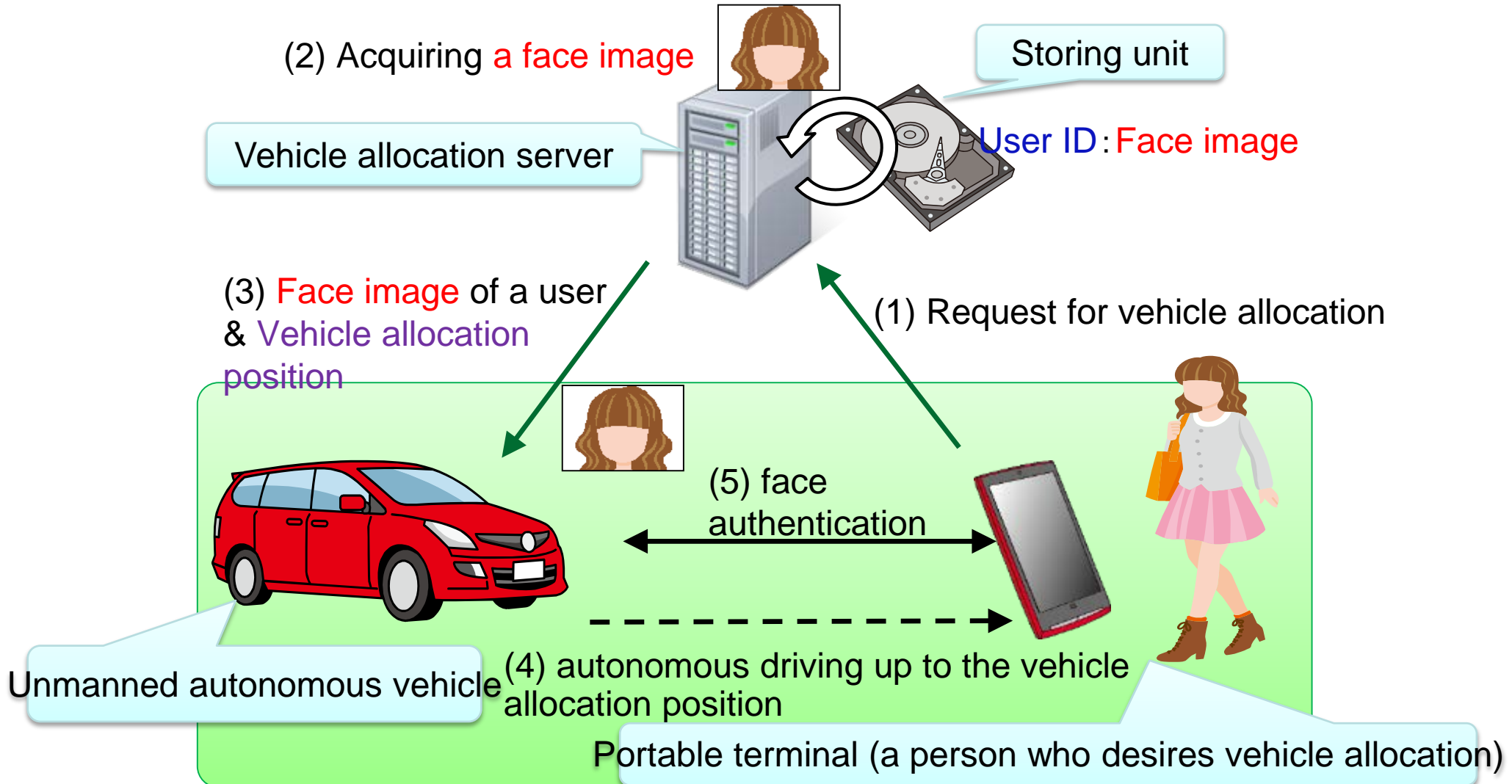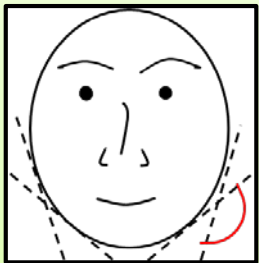
Input data → **AI** → **Output data**

Case examples where the existence of the relationship is supported in the description

* A case where the relationship between input and output data is not known
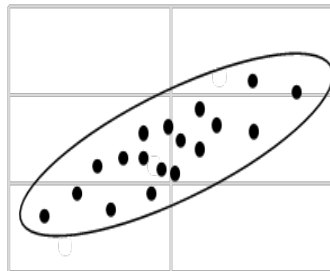
Body weight estimation system

statistically significant correlation
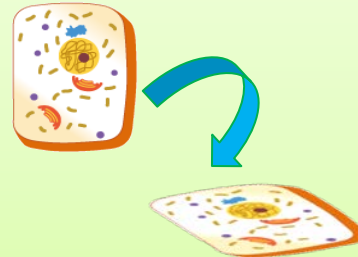
Face-outline angle

Face-outline angle

Body weight

Method for estimating allergy incidence rate of test substance

A shape change of a cell contacted by a test substance

verified through experiment

Allergy incidence rate

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Heavy Rain Point Specifying System

Analyze collected information to specify point at which heavy rain occurs.

Analyzing server

network

Windshield wiper operation sensor

Windshield wiper operation sensor

Windshield wiper operation information, and current position information

Windshield wiper operation sensor

Windshield wiper operation sensor

Windshield wiper operation sensor

Case Examples for Inventive Step

Cited Invention 1

Analyzing server

Network

Windshield wiper operation information

Detect failure of wiper based on wiper operation information

Cited Invention 2

Analyzing server

Network

Messages

Identify the location of heavy rainfall based on messages and current position
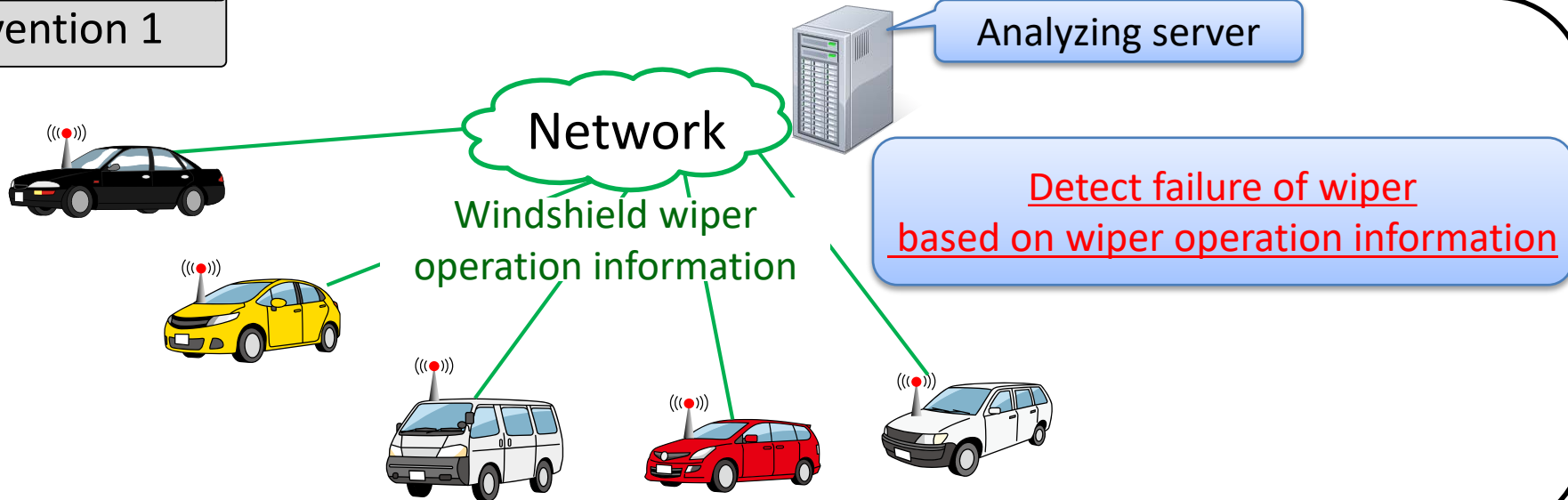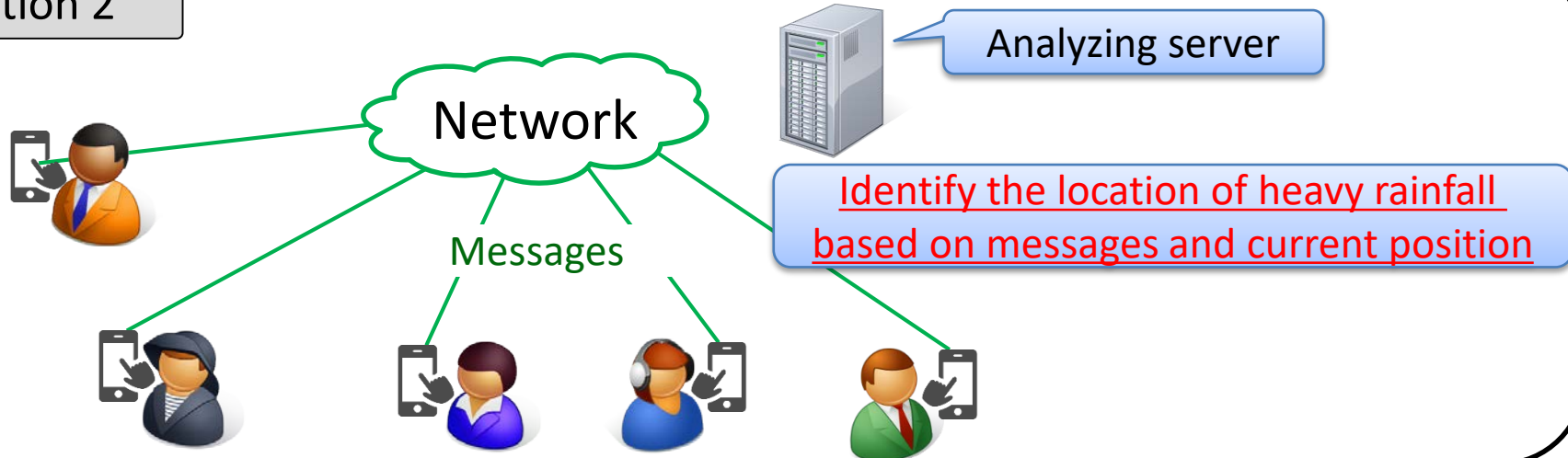
How to access Case Examples

Japanese
https://www.jpo.go.jp/
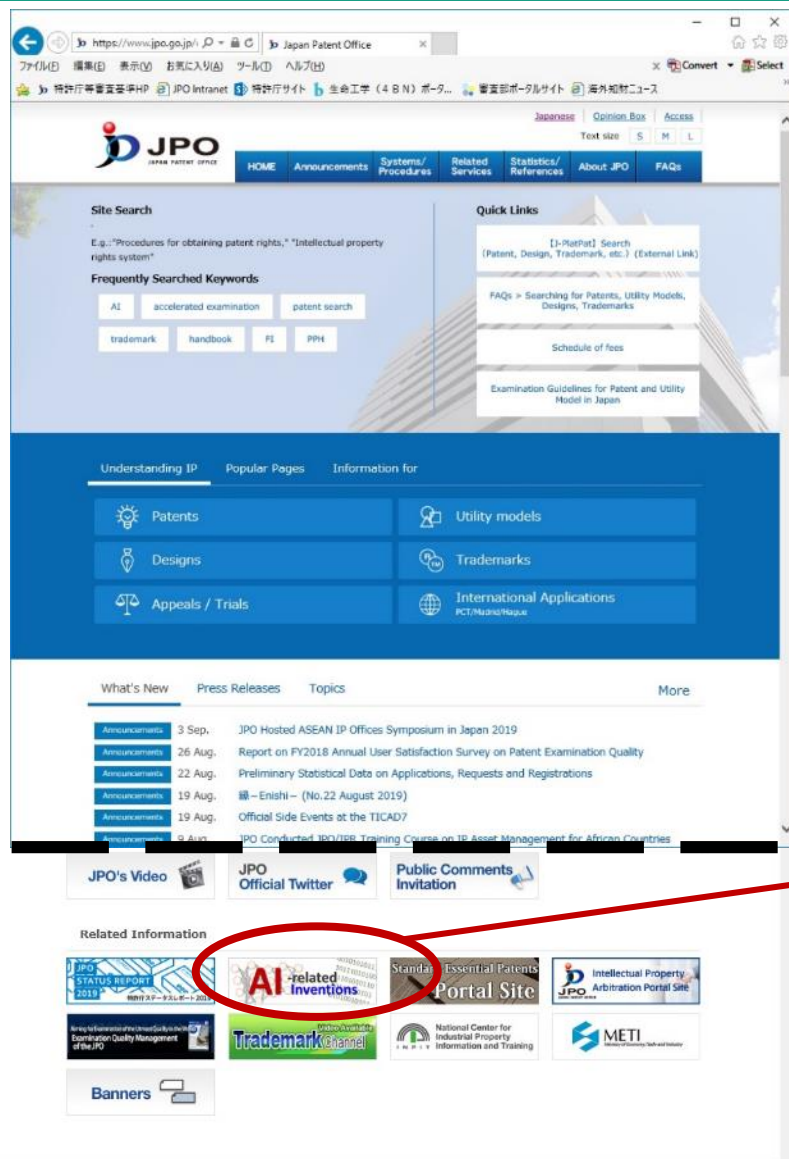
English
https://www.jpo.go.jp/e/

Click here!

New patent classification for IoT -"ZIT"

- JPO created new patent classification **"ZIT"** across IoT related patent applications
- ZIT subdivided into 12 subclasses (ZJA - ZJX) according to use cases

ZIT

subdivide →

12 Subclasses

- Construction industry
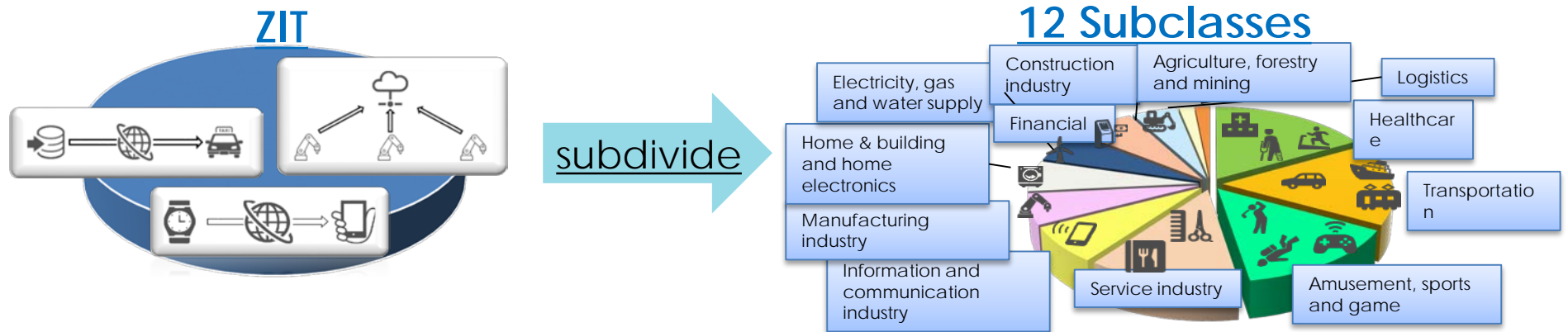- Agriculture, forestry and mining
- Logistics
- Electricity, gas and water supply
- Financial
- Healthcare
- Home & building and home electronics
- Transportation
- Manufacturing industry
- Information and communication industry
- Service industry
- Amusement, sports and game

- Taking the contents of ZIT into consideration, JPO suggested to incorporate a subclass for IoT related technologies into IPC
- The new IPC subclass "**G16Y**" will come into force in January 2020

G16Y

*IPC : International Patent Classification

IoT advisers

Implementation of consultation using knowledge

Examiners in each field
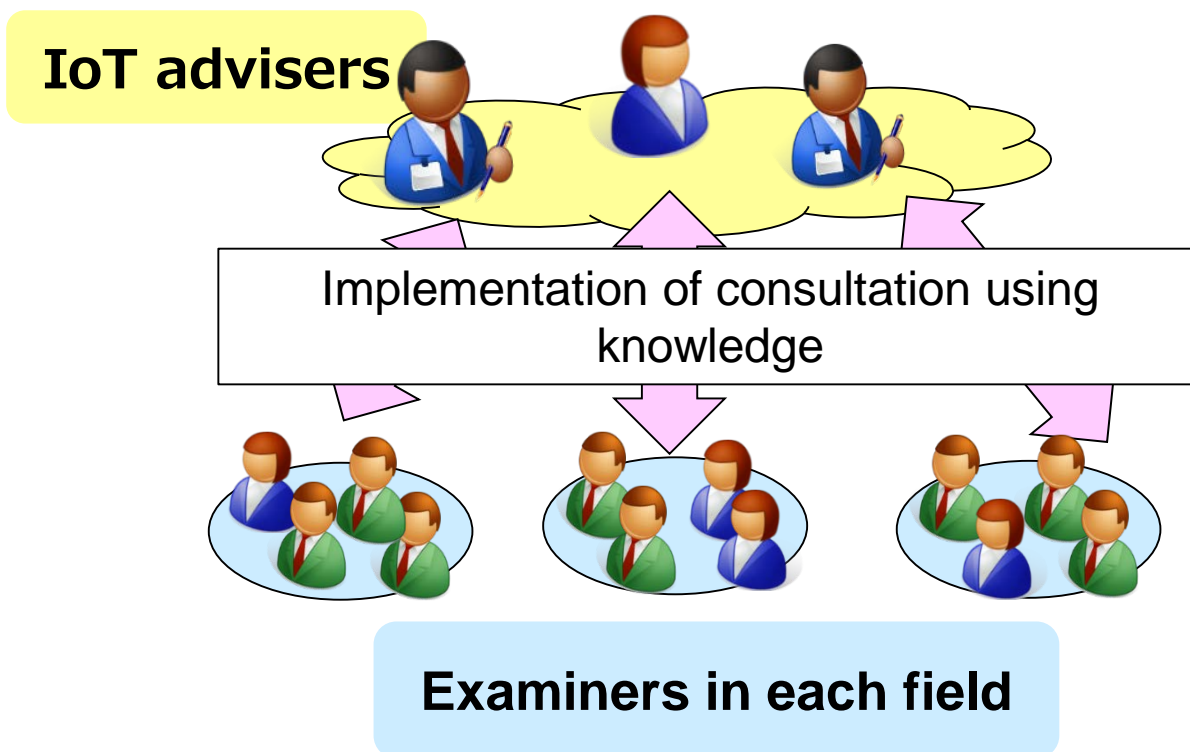
The JPO welcomes feedback from our users

- ✓ Questions?
- ✓ Suggestion for improving JPO services?
- ✓ Obstacle for users to utilize JPO services?
- ✓ Attractive services or systems in other Offices?

Patent Examination of JPO

Facts

Speed

9.3 months
First Action Pendency
FY 2018

14.1 months
Total Pendency
FY 2018

Quality

86 %
Foreign Users' Satisfaction
(Satisfied or somewhat satisfied)
FY 2018

Approx. **4,000**
Interview Practice
FY 2018

Global

42 IP Offices
PPH partners
As of the end of September 2018

Approx. **74,000**
PPH based on JPO's Examination result
As of the end of December 2018

Patent Examination of JPO

Facts

Normal	Fast Track	Super Fast
14.1 months	**5.1** months	**2.4** months
Total Pendency	Total Pendency	Total Pendency
FY 2018	FY 2018	FY 2018

For Free of Charge

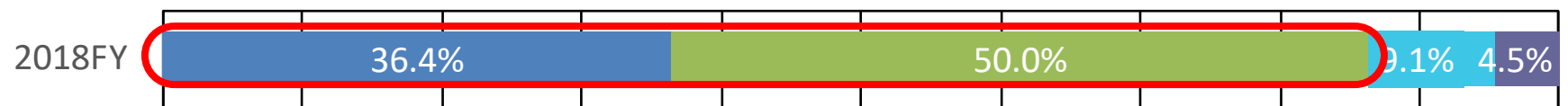| Total pendency of other Offices (2017)			
USA	**China**	**Europe**	**Korea**
24.2 months	22.0 months	24.9 months	15.9 months

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High Quality: User Satisfaction Survey on Patent Exam Quality

"Satisfied" + "Somewhat satisfied" has been increasing every year

Year	5: Satisfied	4: Somewhat Satisfied	3: Neutral	2: Somewhat Unsatisfied	1: Unsatisfied
2012FY	1.4%	30.2%	56.6%	11.3%	0.5%
2013FY	1.5%	43.5%	47.5%	7.3%	0.2%
2014FY	2.7%	44.4%	44.0%	8.4%	0.5%
2015FY	3.8%	50.5%	39.4%	6.2%	0.2%
2016FY	4.2%	52.8%	37.0%	5.7%	0.3%
2017FY	5.3%	53.0%	35.2%	6.2%	0.3%
2018FY	7.4%	54.8%	32.2%	4.9%	0.7%

■ 5: Satisfied ■ 4: Somewhat Satisfied ■ 3: Neutral ■ 2: Somewhat Unsatisfied ■ 1: Unsatisfied

Facts
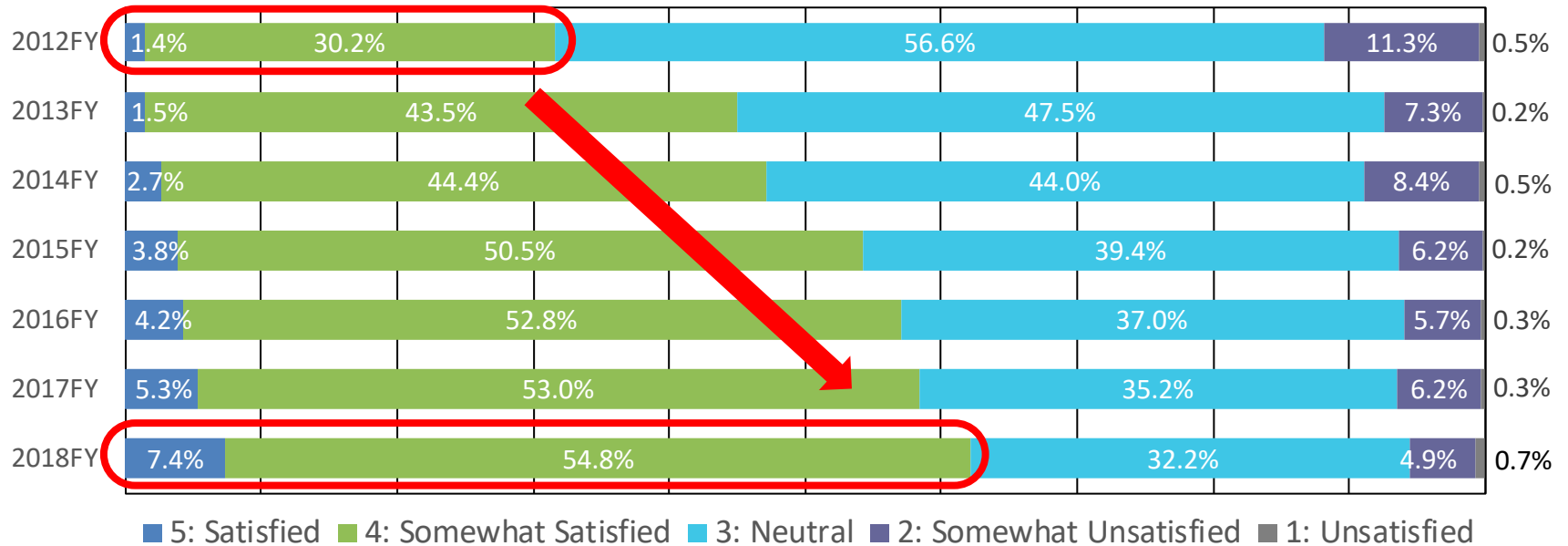
"Satisfied" + "Somewhat Satisfied" represents
86% for foreign users* in FY2018.

*22 foreign users replied for this survey.

Year	5: Satisfied	4: Somewhat Satisfied	3: Neutral	2: Somewhat Unsatisfied	1: Unsatisfied
2018FY	36.4%	50.0%	9.1%	4.5%	

■ 5: Satisfied ■ 4: Somewhat Satisfied ■ 3: Neutral ■ 2: Somewhat Unsatisfied ■ 1: Unsatisfied

To obtain IP rights **in line with Business Strategy**

Timeliness

Interaction

Accelerated Examination

↕

Up to **3 years**
for Exam. Request

Collective Examination for IP Portfolio

Design

Patent A

Trademark

Patent B

Interview with Patent Examiner

Face-to-Face
or
Video Conference

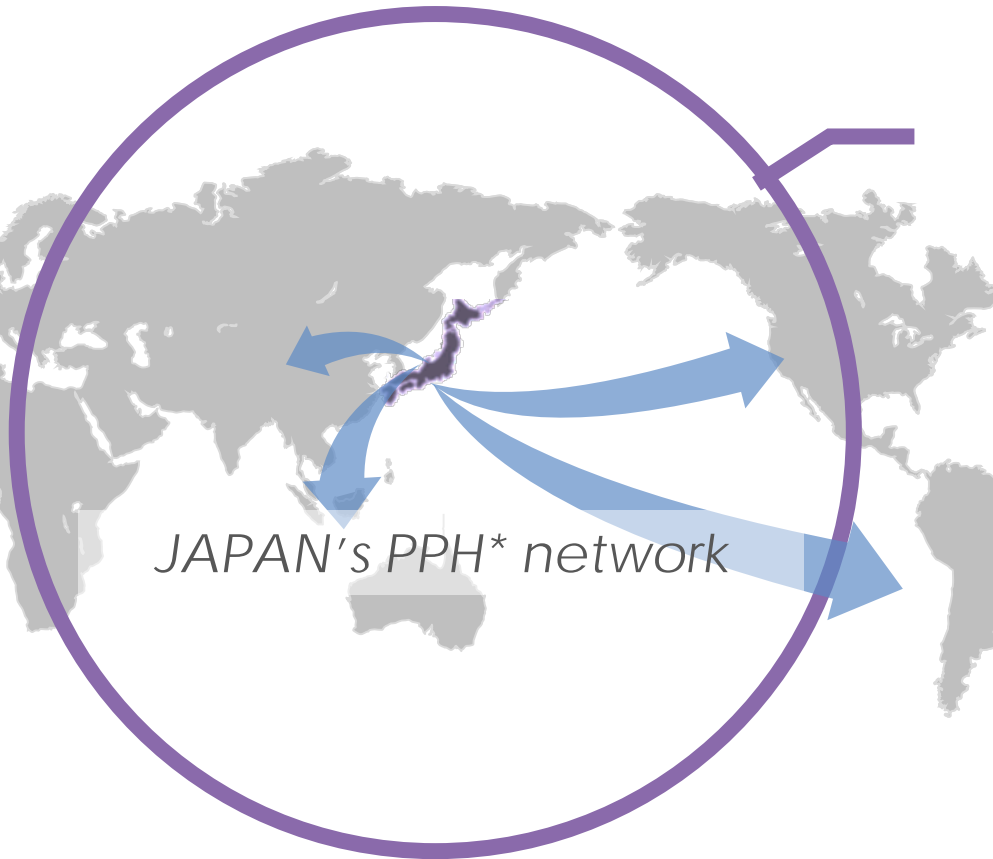# To obtain patents **through More Communication**

Closer communication with Examiners

- **Anywhere** (face-to-face, telephone, teleconference)
- **At any stage of examination**
- **Free of charge**

To build **IP Portfolio in the world**

JAPAN's PPH* network

High Speed

2.5 months for grant
(Super fast track in Japan)
+
within 1.5 year
(PPH in the world)

Best Quality

Grant rate **:** more than 80%

* PPH : Patent Prosecution Highway