# Utilization of AI for patent classifications at JPO

February 2022

Japan Patent Office



### **Outline of patent examination**

Acceptance of application

**Formality Examination** 

Substantive Examination (Patent)

Registration



Finding document highly relevant with claimed invention from a large amount of technical literatures

Classification

**Understanding of Claimed Invention** 

**Prior Art Search** 

Patentability Judgement

Assigning patent classification based on technical contents of application

Understanding claimed invention by careful reading of application documents

Examination of patentability

- Novelty
- Inventive step
- Description requirement etc.

## Purpose for making use of AI technology

### Change of JPO's work

Advancement of technologies
Expanding search target
Increase in trademark applications
Retirement of experienced officials

### **Progress of AI technology**

Machine Learning
Natural Language Processing
Deep Learning

Making use of AI technology

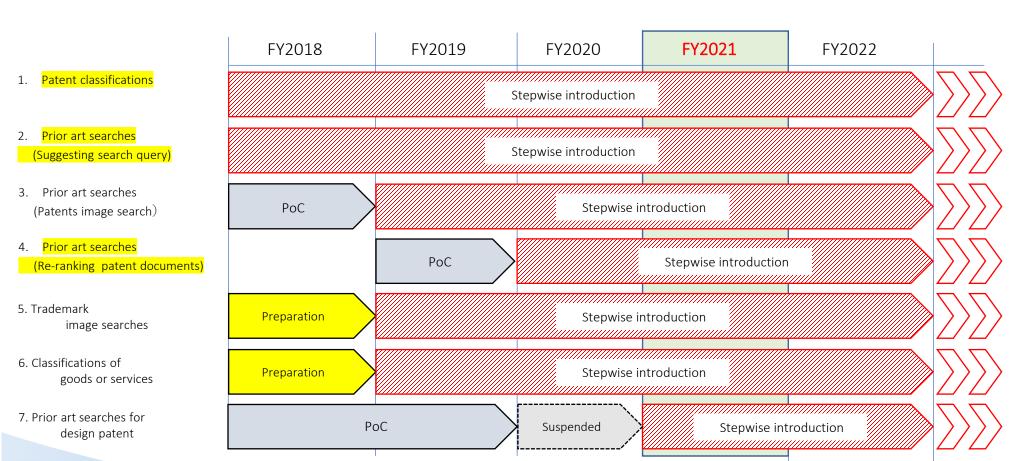
# Goal!

**Sophisticated** and **efficient** operations

→ Improve user services

### **Action plan**

- JPO has made activities for making use of AI technology based on **Action plan** since FY2017.
- Action plan was revised in FY2021 based on the result of activities in FY2020.



<sup>(\*)</sup> The above actions are based on rough estimates and progress may vary depending on the development of demonstrations, advancement of the relevant technologies and other circumstances.

## Major revision of AI action plan

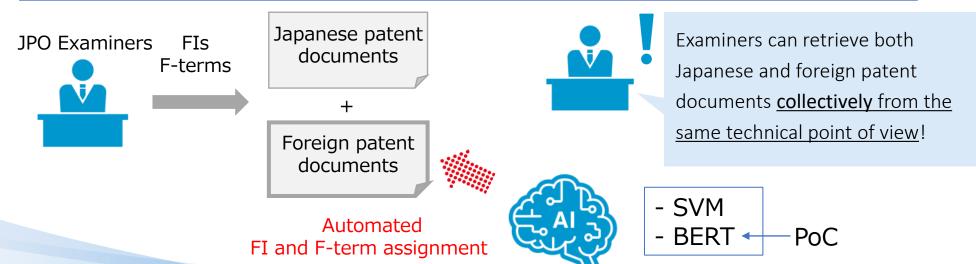
- The JPO is planning to revise the plan significantly because
  - all projects are moved to the PoB phase
  - AI technology rapidly developed in these 5 years
- The JPO review the AI-related activities since 2017. At the same time, the JPO is investigating the latest AI-related technology and considering which office work is effective to apply AI technology.
- This revision project is underway with external experts.
- New AI action plan will be released in 2022.

### **Auto classification**

#### **Main Points**

**Issue:** JPO examiners couldn't use FIs and F-terms (JPO-specific search indexes) to retrieve foreign patent documents though they are useful to retrieve relevant documents to Japanese applications.

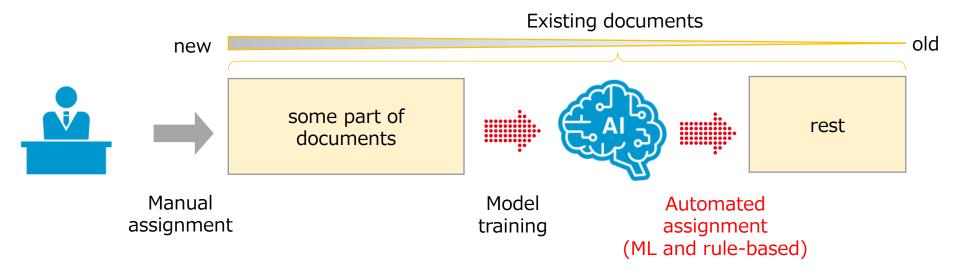
**Solution:** Assigning FIs and F-terms to foreign patent documents automatically, JPO examiners can conduct collective search on Japanese and foreign documents with the indexes.



## Further consideration for auto classification

- The JPO started to apply BERT to auto classification.
- The JPO is considering applying auto classification to the re-classification as a pilot program.

#### Auto re-classification

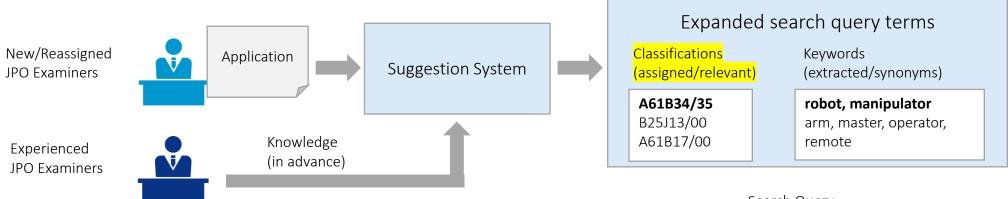


### **Expanding search query terms**

#### **Main Points**

<u>Issue</u>: It's difficult for new/reassigned examiners to select effective search query terms.

**Solution:** Possible classifications, keywords and synonyms based on the accumulated knowledge and experiences of experienced examiners help new/reassigned examiners a lot.



With Advanced Knowledge and Experiences:

- Knowledge of classifications of the experienced technical fields and related technologies
- Rich knowledge of a variety of synonyms

Japan Patent Office

#### Search Query

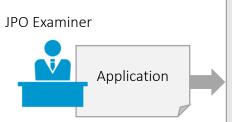
(A61B34/35+B25J3/00) AND (robot+manipulator+arm+master)

## **Displaying Ranking of Patent Documents**

#### **Main Points**

Issue: Examiners had to read hundreds of documents to retrieve a relevant document.

**Solution:** Examiners can read the most important document first if the candidate documents are ordered by the possibility to be cited.



Search System

Re-rank the documents with the machine-learned model.

The model is learned with:

- cited or not
- similarity of feature words
- difference of the publication years
- similarity of assigned classifications etc.

#### Search Results

- 1. JP2018-100007A
- 2. JP2018-100005A
- 3. JP2018-100001A

. . .

100. JP1998-100001A

Possibility to be cited

High

Low

# Thank you!

