

# Utilization of AI for patent classifications at JPO

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February 2023

Japan Patent Office



# Development of a New Action Plan

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- In FY2017, the JPO published the "Action Plan for Utilization of Artificial Intelligence (AI) Technology" (hereinafter referred to as the "Action Plan"), describing a six-year plan (until FY2022) for the utilization of AI technology to improve efficiency and quality of the JPO administrative work. Since then, the JPO has promoted the projects while revising the Action Plan annually.
- AI Research Project was conducted in FY2021 in order to consider how AI technology should be used in the JPO over the next five years in light of recent changes in the circumstances surrounding the JPO and rapid advancement of AI technology.
- The AI Research Project was mainly conducted on the following items
  - (1) Review of the progress of the Action Plan to date
  - (2) Recent advancement of AI technology
  - (3) Recommendations on how to proceed in the future based on (1) and (2)
- A new Action Plan (FY2022-2026 edition) was developed considering the results of the AI Research Project and opinions from external experts.

## Outline of the results of the AI Research Project and the direction of the development of new Action Plan

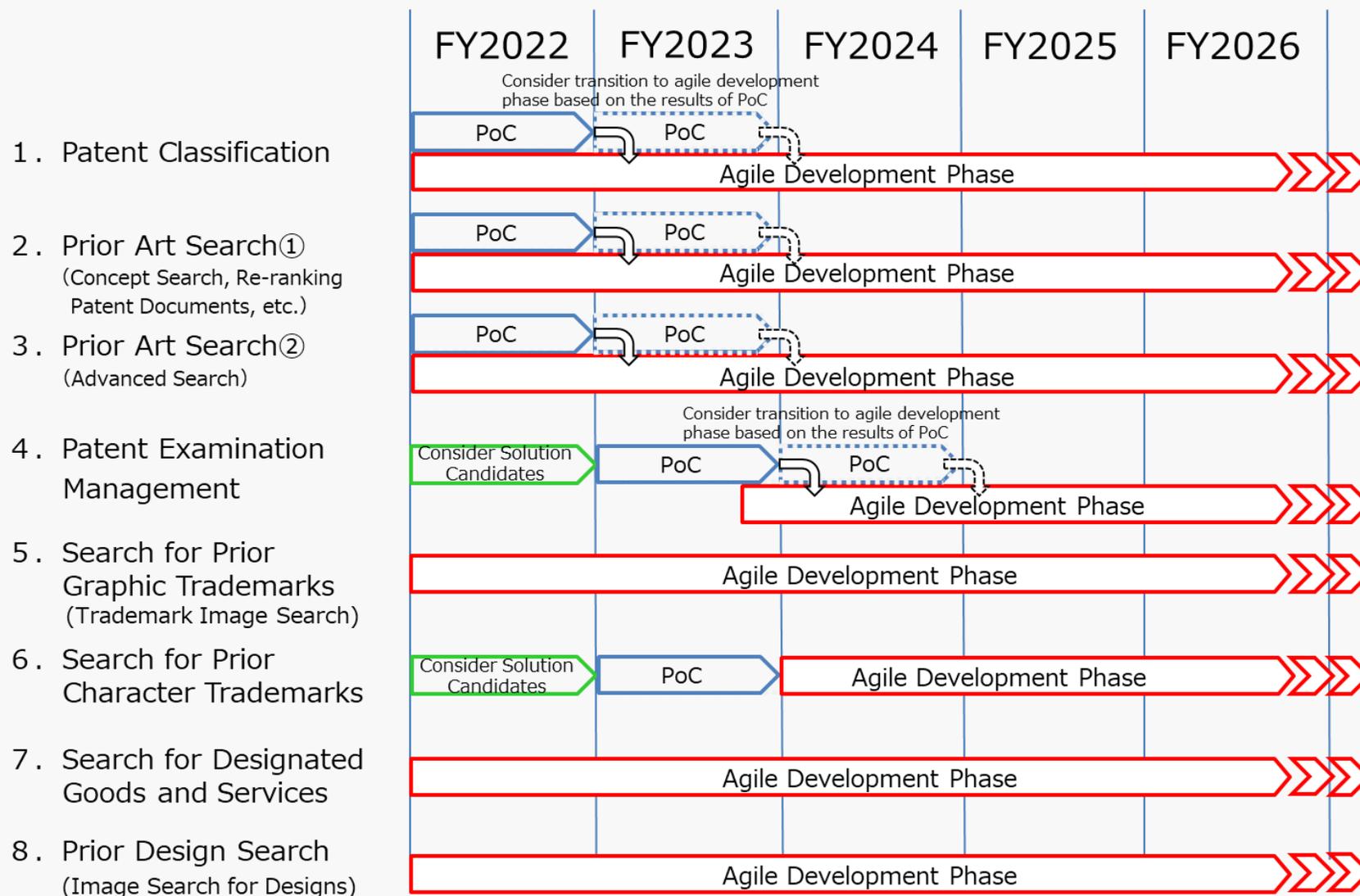
- The progress and achievements of the Action Plan to date (i.e., technology verification through Proof of Concept (PoC) processes, trial provision of tools developed in agile development processes) were positively evaluated in the AI Research Project. The past progress and achievements were also highly evaluated by external experts.
- Recent advancement of AI technologies (especially natural language processing technologies such as BERT) that are considered applicable to the JPO administrative work was confirmed in the AI Research Project.
- In parallel with the AI Research Project, interviews on business issues were conducted with each section and division of the JPO, and new project candidates were discussed while also seeking opinions of external experts.

New Action Plan was developed based on the following policies.



- Continue with the existing overall approach
- Incorporate new technologies
- Add new projects to solve newly identified business issues

# Action Plan for Utilization of AI technology (FY2022-2026 edition)



(※) The initiatives of each project are rough assumptions and may change in the future depending on the progress, budget conditions, and other various circumstances.

# Details of each patent project (Projects listed in the Action Plan)

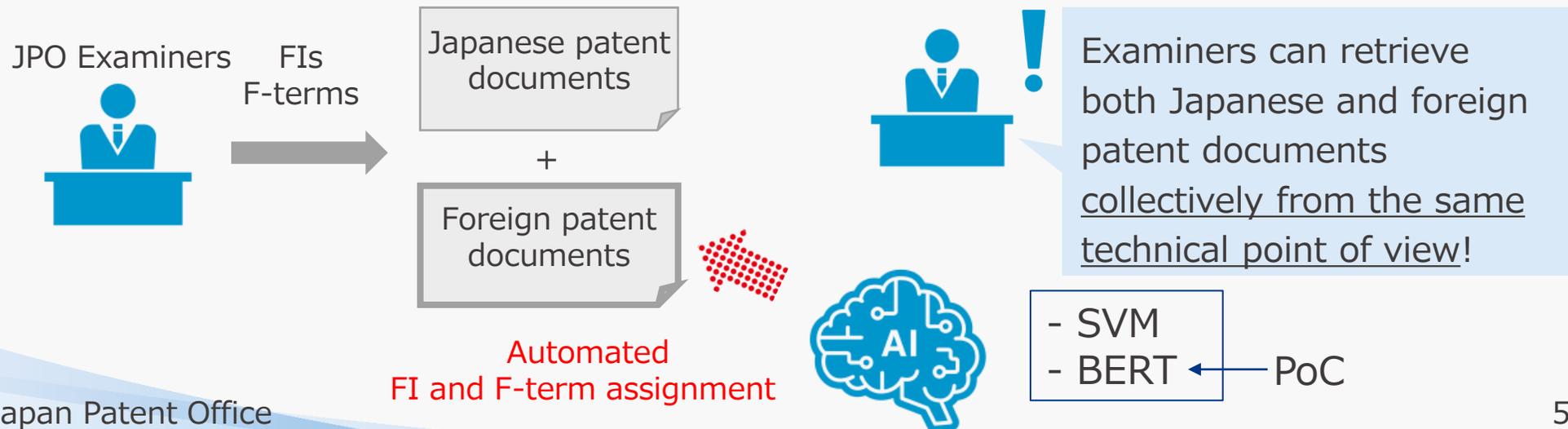
<b>1. Patent Classification [Continued + new PoC]</b>	
<b>Aims</b>	Improve efficiency and quality of prior art search for foreign patent documents
<b>Outline</b>	Predict JPO patent classifications (theme codes, FIs, F-terms) for foreign patent documents using machine-translated Japanese text as input
<b>The Way Forward</b>	In parallel with continuing the agile development phase, a new PoC project* will be conducted in FY2022. Transition to agile development phase (incorporation of new technologies) will be considered based on the results of the new PoC project
<b>2. Prior Art Search (1) (Concept Search, Re-ranking Patent Documents, etc.) [Continued + new PoC]</b>	
<b>Aims</b>	Improve efficiency and quality of prior art search
<b>Outline</b>	<ul style="list-style-type: none"> <li>•Retrieve similar documents to the application being examined based on similarity of text data</li> <li>•Calculate scores representing the similarity based on text data and meta data contained in the application being examined and the target prior patent documents and re-rank the documents in order of the scores</li> </ul>
<b>The Way Forward</b>	In parallel with continuing the agile development phase, a new PoC project* will be conducted in FY2022. Transition to agile development phase (incorporation of new technologies) will be considered based on the results of the new PoC project
<b>3. Prior Art Search (2) (Advanced Search) [Continued + new PoC]</b>	
<b>Aims</b>	Improve efficiency and quality of prior art search
<b>Outline</b>	<ul style="list-style-type: none"> <li>•Display patent documents with figures that are highly relevant to the figures of the application being examined</li> <li>•Suggest useful keywords for creating search queries based on text data of the application being examined</li> <li>•Consider new search paradigms that utilize AI technology, etc.</li> </ul>
<b>The Way Forward</b>	In parallel with continuing the agile development phase, a new PoC project* will be conducted in FY2022. Transition to agile development phase (incorporation of new technologies) will be considered based on the results of the new PoC project
<b>4. Patent Examination Management [New]</b>	
<b>Aims</b>	Conduct management tasks around the patent substantial examination process more effectively and efficiently
<b>Outline</b>	Consider how to implement management tasks such as appropriate distribution of applications effectively and efficiently, taking account into the use of AI technology, etc.
<b>The Way Forward</b>	Solution candidates will be considered in FY2022 and a new PoC project will be conducted in FY2023. Transition to agile development phase will be considered based on the result of the PoC project

# Patent 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.

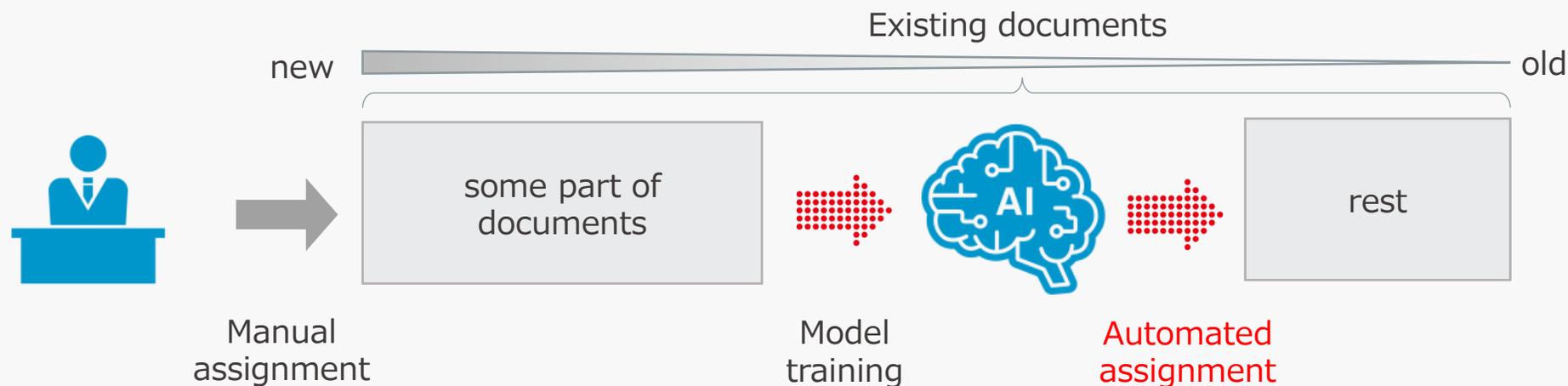
**Solution:** Assigning FIs and F-terms to foreign patent documents automatically, JPO examiners can conduct collective search on Japanese and foreign documents with the indexes.



# Further consideration for patent classification

- The JPO is considering applying BERT to auto classification.
- The JPO is considering applying auto classification to the re-classification.

## Auto re-classification

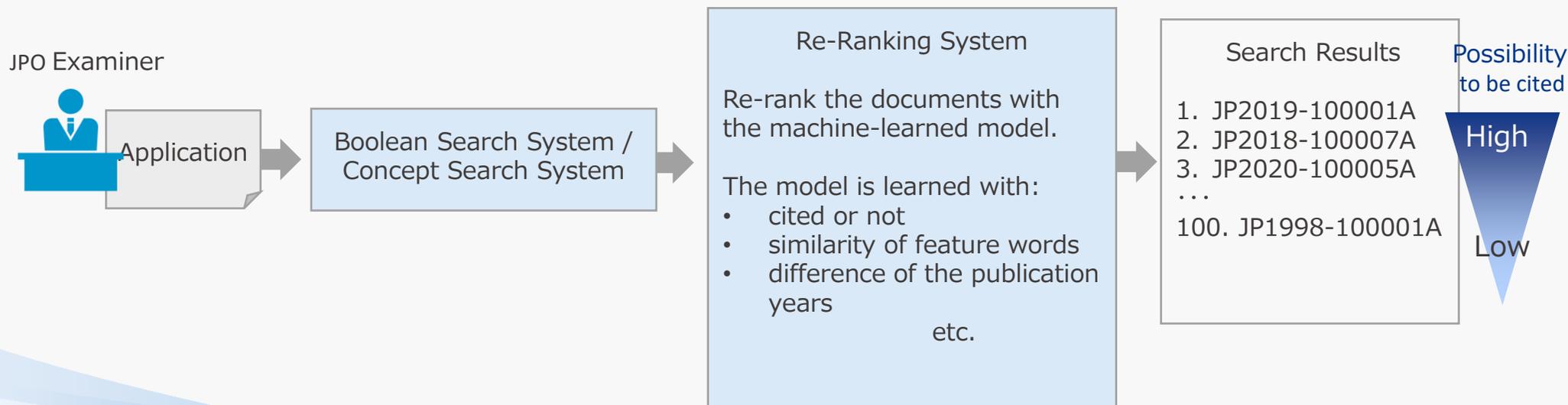


# Concept Search and Re-Ranking Patent Documents

## 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.

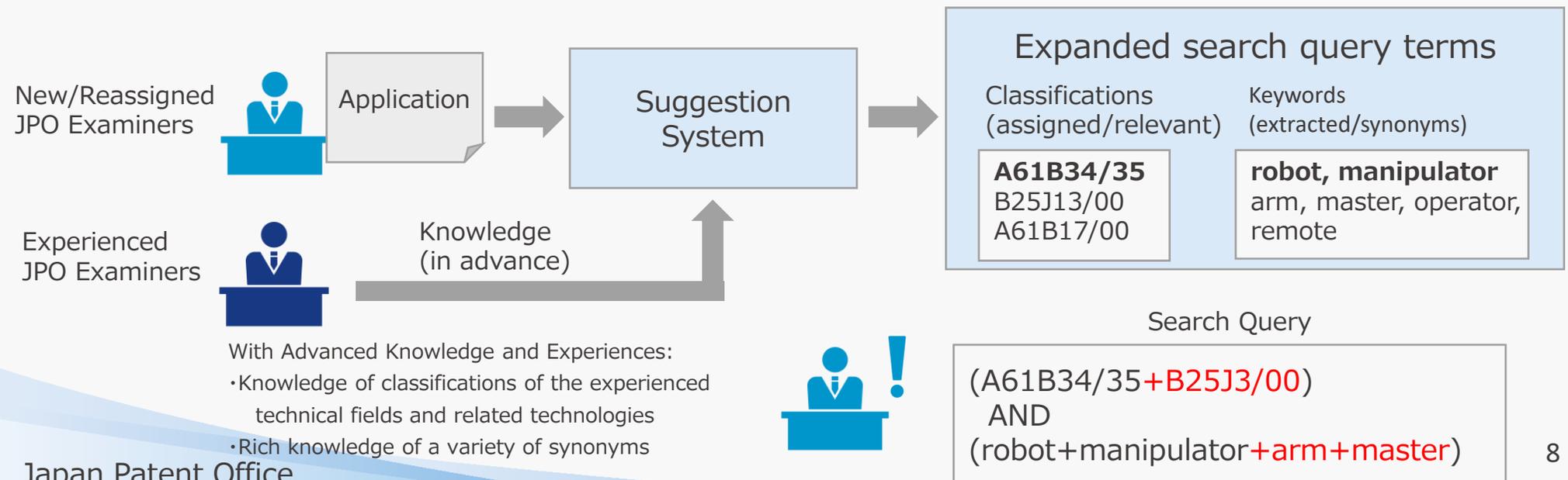


# Advanced Search - Expanding search query terms -

## Main Points

**Issue:** 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.

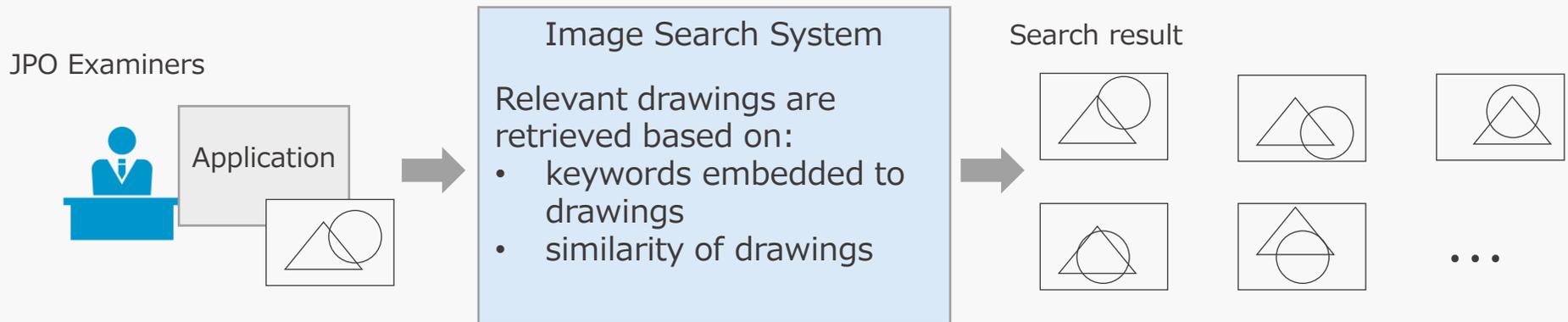


# Advanced Search - Patent Image Searches -

## Main Points

**Issue:** Sometimes drawings contain very important information especially regarding shapes or structures of things. But text search queries are not so effective to retrieve such useful drawings.

**Solution:** The information originated from drawings of the application is thought to be useful to obtain relevant drawings.

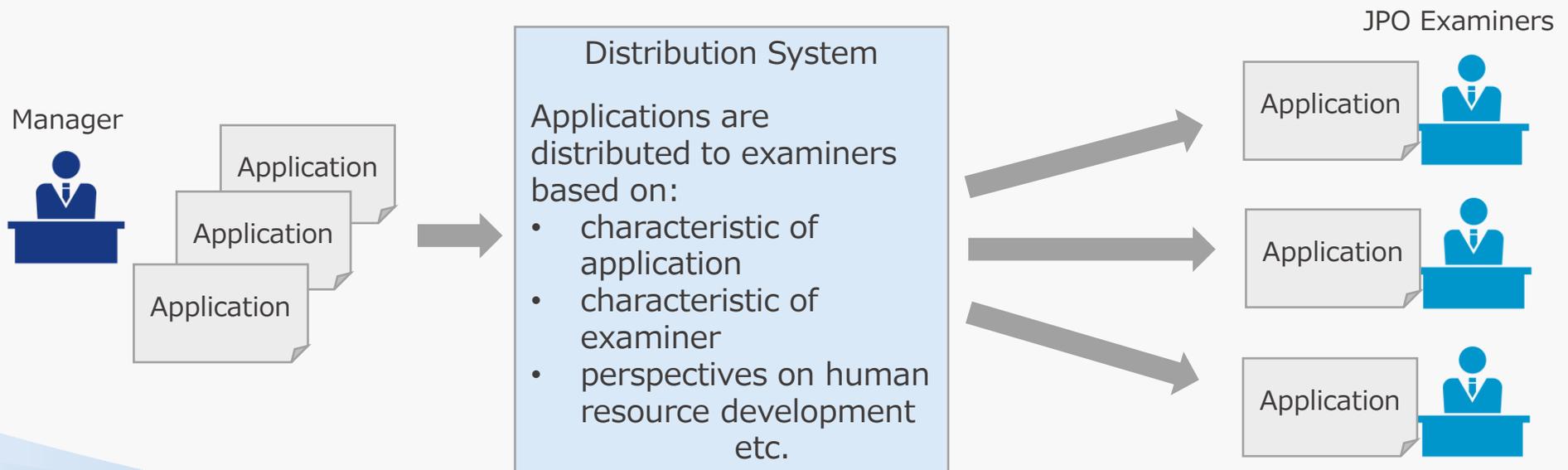


# Patent Examination Management

## Main Points

**Issue:** It is preferable to conduct management tasks around the patent substantial examination process more effectively and efficiently.

**Solution:** Candidate for solution is being considered in FY 2022. A case under consideration is distribution of applications.



# Thank you!

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Japan Patent Office

