26th February 2025
IPC/CE/56

JPO's update on AI Utilization

- Revision of AI Action Plan
- AI Utilization for Patent Classification

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Patent Classification Policy Planning Section

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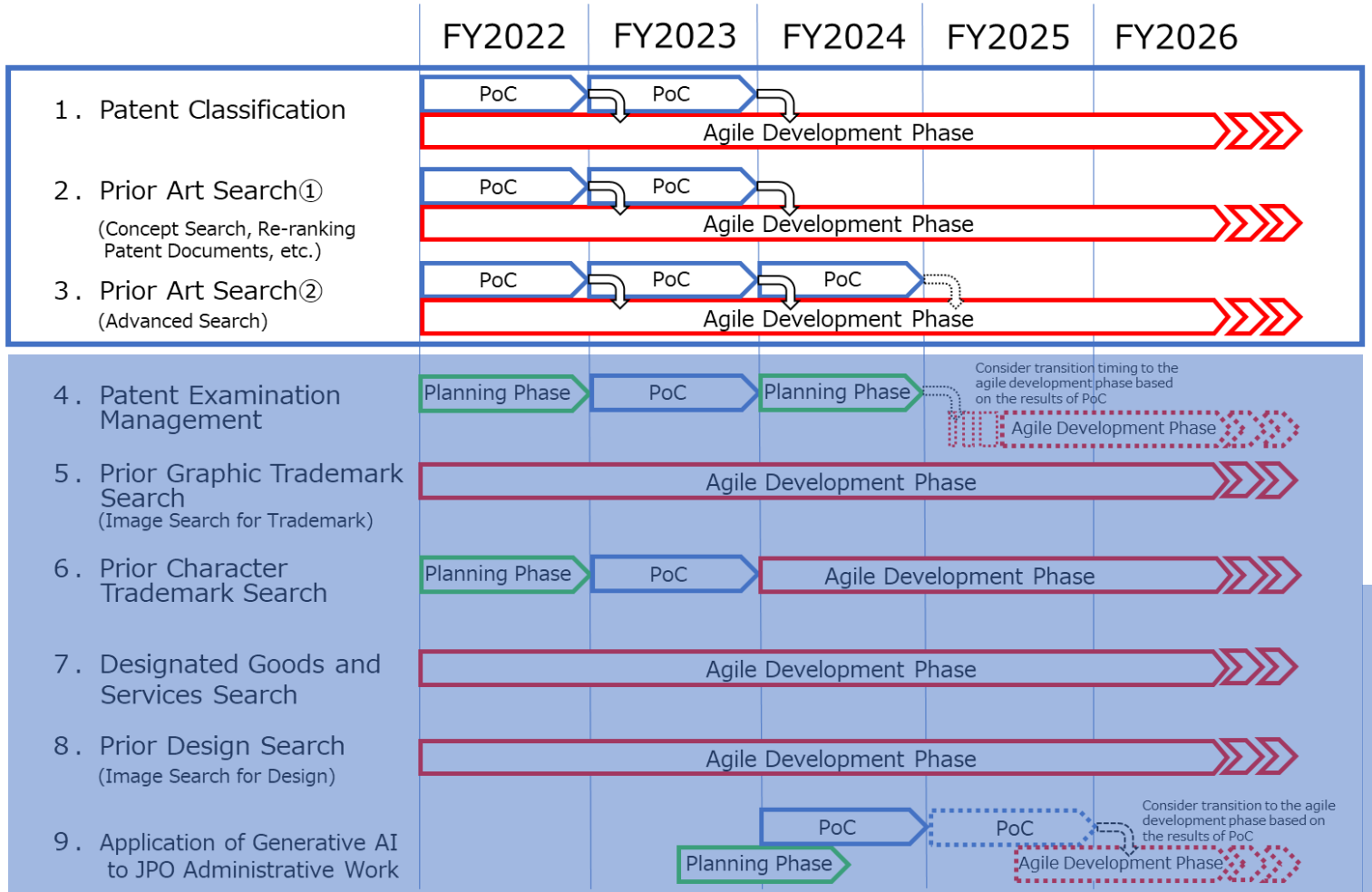
Contents

- AI Action Plan (Rev. 2024)

- AI Utilization for Patent Classification
  - Patent Classification by Machine Learning
  - Developing AI-Based Patent Classification

Action Plan for Utilization of AI Technology (Rev.2024)

You can see from QR.



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

What's NEW!!

Patent Classification & Prior Art Search①

- Transitioned **to agile development phase**.

Prior Art Search②

- PoC will be conducted in FY2024, study on **"Developing AI-Based Patent Classification"** has launched.

Application of Generative AI to JPO administrative work

- Planning and PoC will be conducted in FY2024, paying attention to changes in technological trends due to rapid evolution and government policies on handling of **generative AI**.

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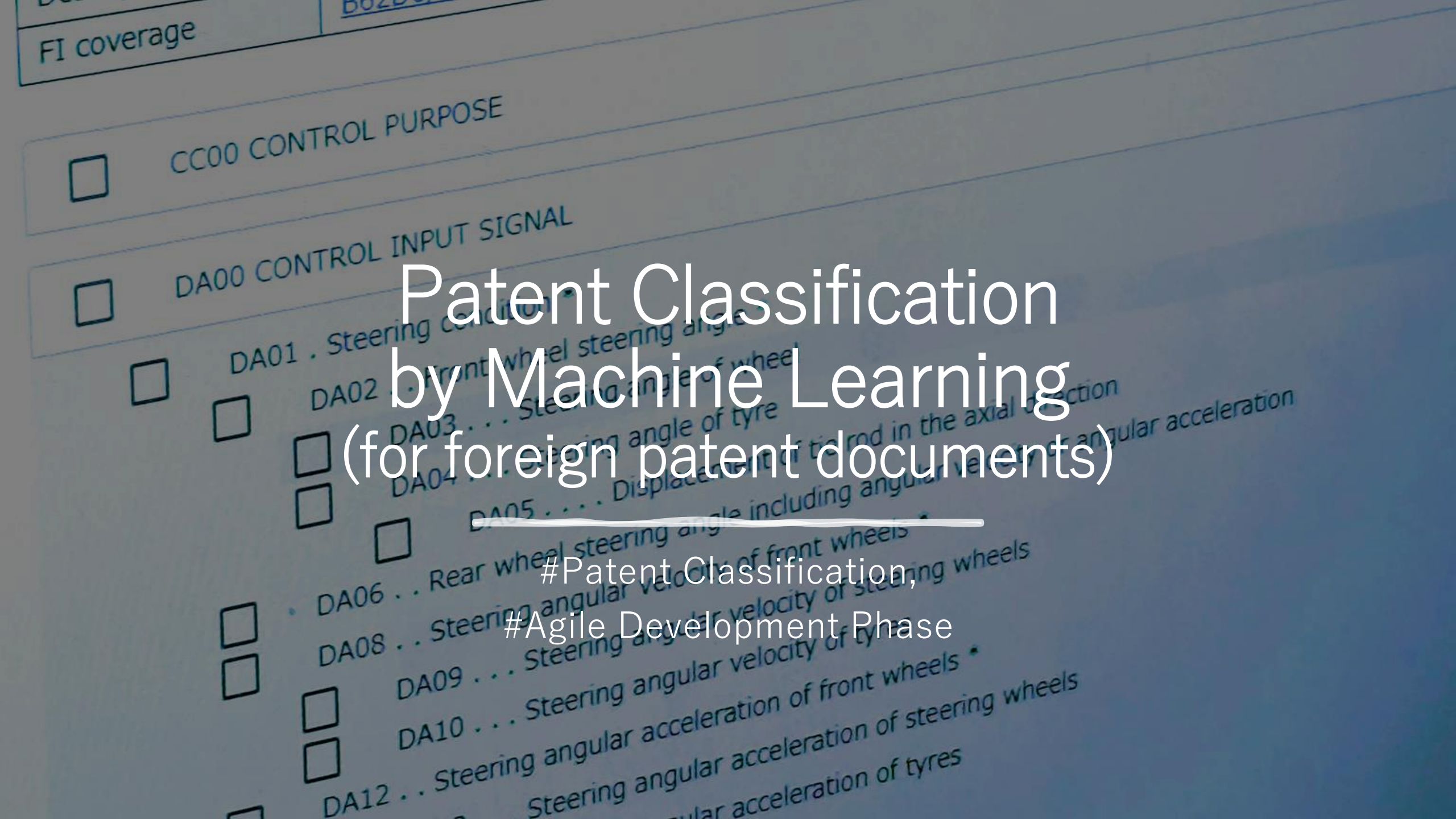
AI Utilization for Patent Classification

The burden continues to increase!

Efficient Patent Classification System



Patent Classification by Machine Learning (for foreign patent documents)

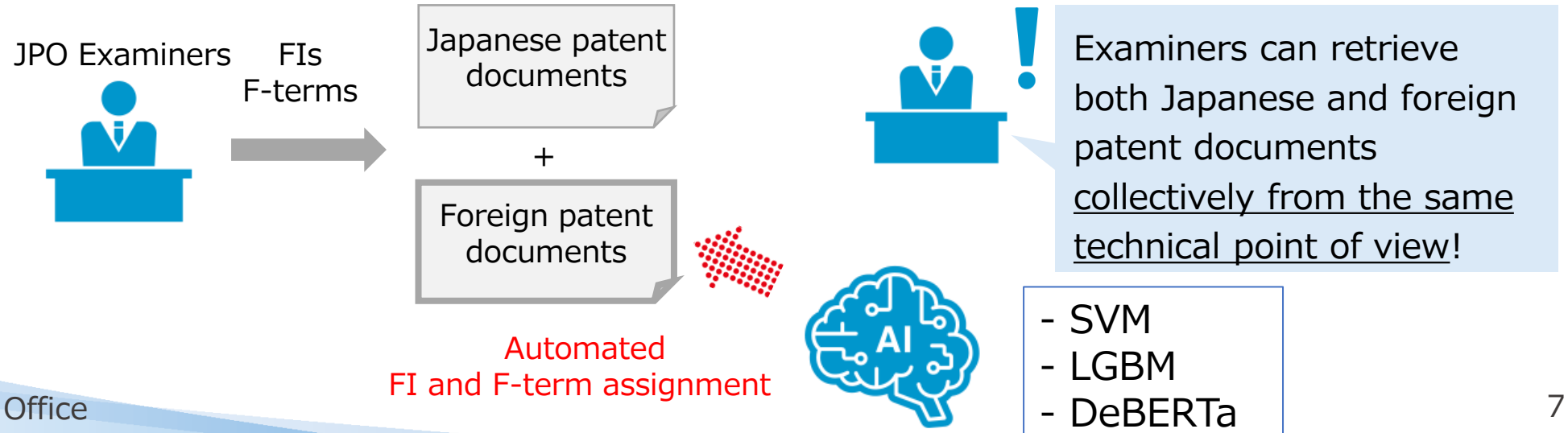
#Patent Classification,
#Agile Development Phase

Patent classification(for foreign patent documents)

Main Points

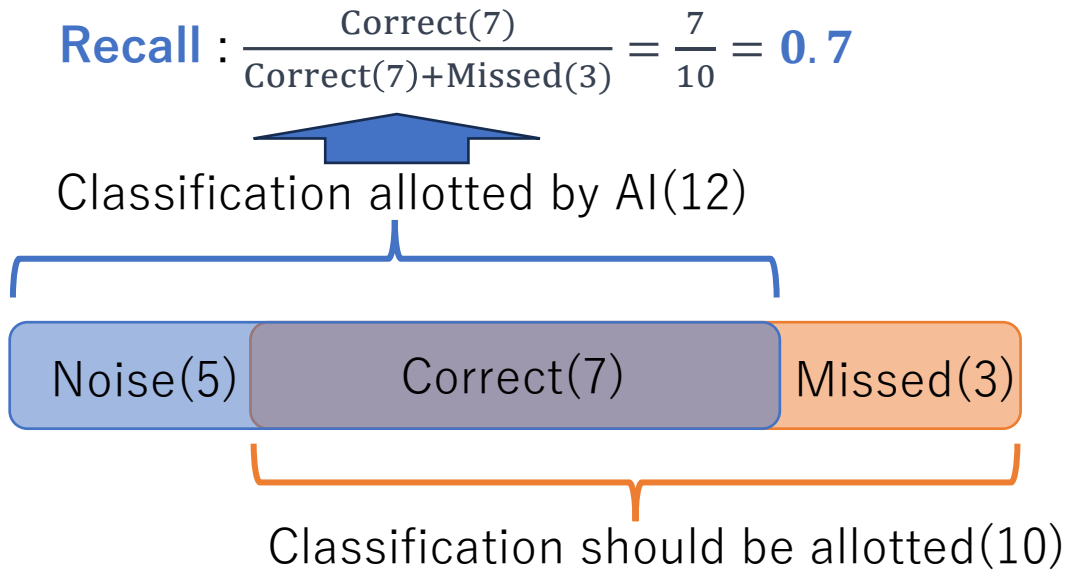
Issue: JPO examiners couldn't use FIs and F-terms (JPO-specific search indexes) to retrieve foreign patent documents though they are useful to retrieve relevant documents to Japanese applications.

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.



Method for Patent Classification by Machine Learning(1)

We use **F-value**, a common metric for evaluating machine learning models, for Patent Classification.

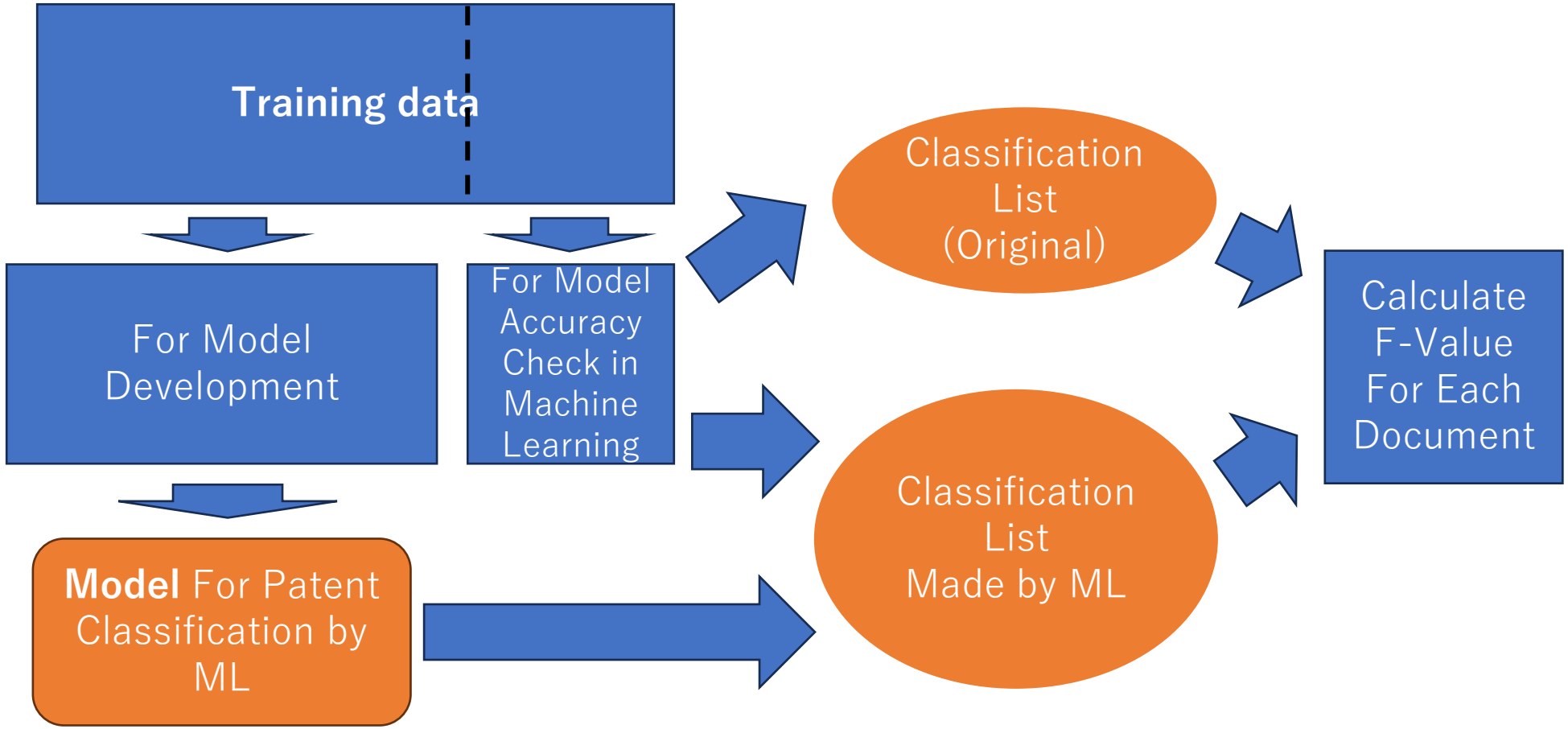


Precision: $\frac{\text{Correct}(7)}{\text{Correct}(7)+\text{Noise}(5)} = \frac{7}{12} = 0.58$

F-value$= \frac{2\times\text{Recall}\times\text{Precision}}{\text{Recall}+\text{Precision}} = \frac{2*0.7*0.58}{0.7+0.58} = 0.63$

Method for Patent Classification by Machine Learning(2)

Decide whether allot certain classification to a document or not, by using SVM, LGBM, DeBERTa).



We need **Standard Criteria of AI Classification**
with Same Metrics, Same Training Data.

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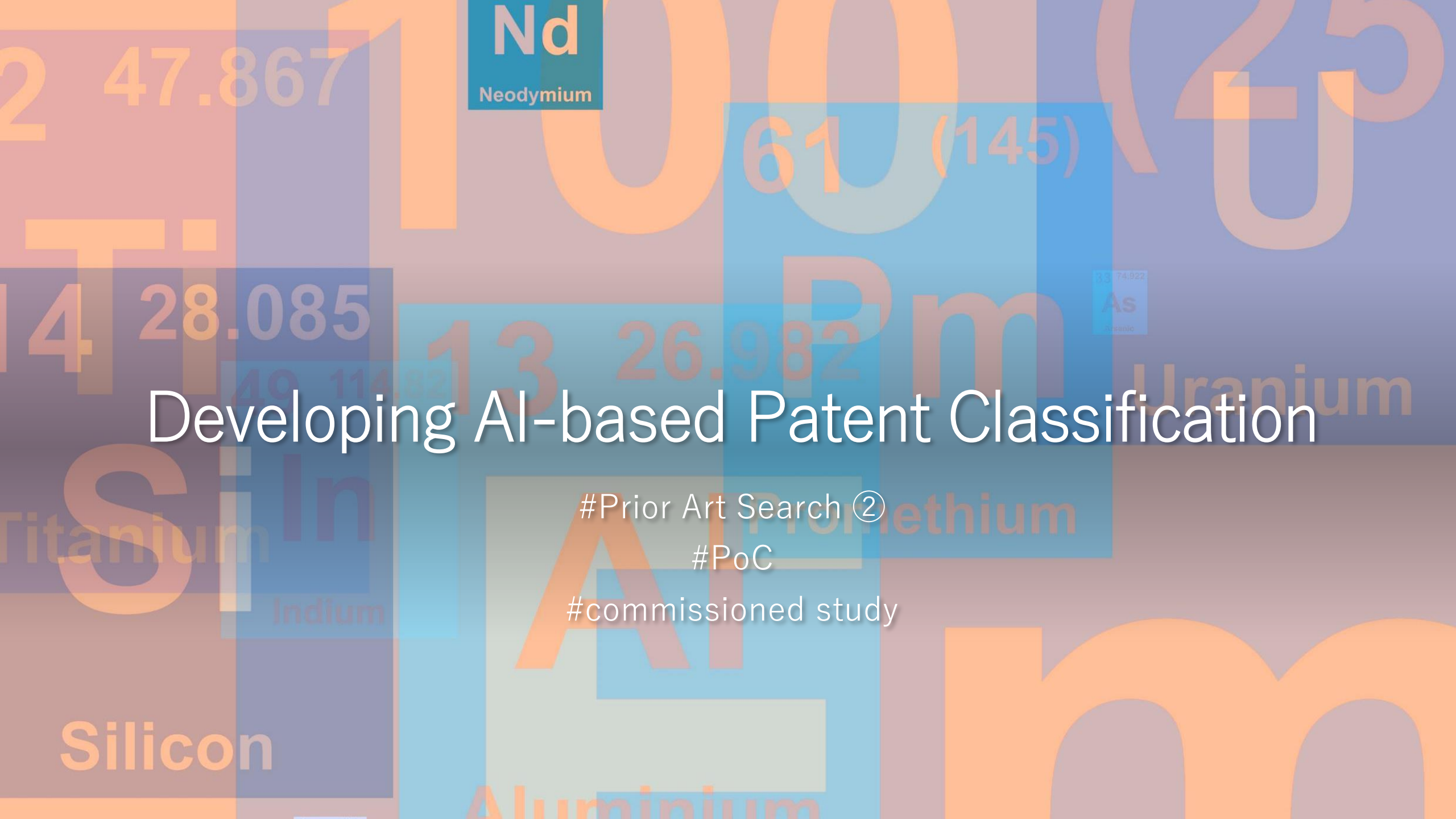


Developing AI-based Patent Classification

#Prior Art Search ②

#PoC

#commissioned study

Developing AI-based Patent Classification

Main Points

Issue:

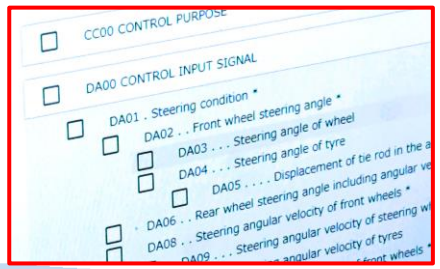
- Developing patent classification has (1)”Creating Classification” and (2) “Assigning Classification”. The both are usually Human-based but it needs a lot of Time & Cost.
- Machinery classification is only for “Assigning Classification” and some classification is not suitable for AI.

Solution:

- Using AI to create new patent classifications automatically.
  - Training AI model from patent documents and Create new Classification automatically.
  - Label Classification by same AI model.

Patent Documents in one Theme.

Unsupervised Training & Creating New Classification



Assigning Classification

Label A: Purpose is Stability
Label B: Input signal is Steering
Label C: Control by Electric motor
…

Label A: Purpose is Response
Label B: Control by Electric motor
Label C: using Gyro Sensor
…

Thank you!

Merci!

If you have any questions, please ask me & my colleagues

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