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AI/Data Analytics Project

Next-generation KONEPS

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Introducing the Lecturer

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AI & Big data expert (2016.7 ~)

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- SK AI/Big data analysis instructor (2017.8 ~)
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- Next Generation KONEPS Project (2022.12 ~)

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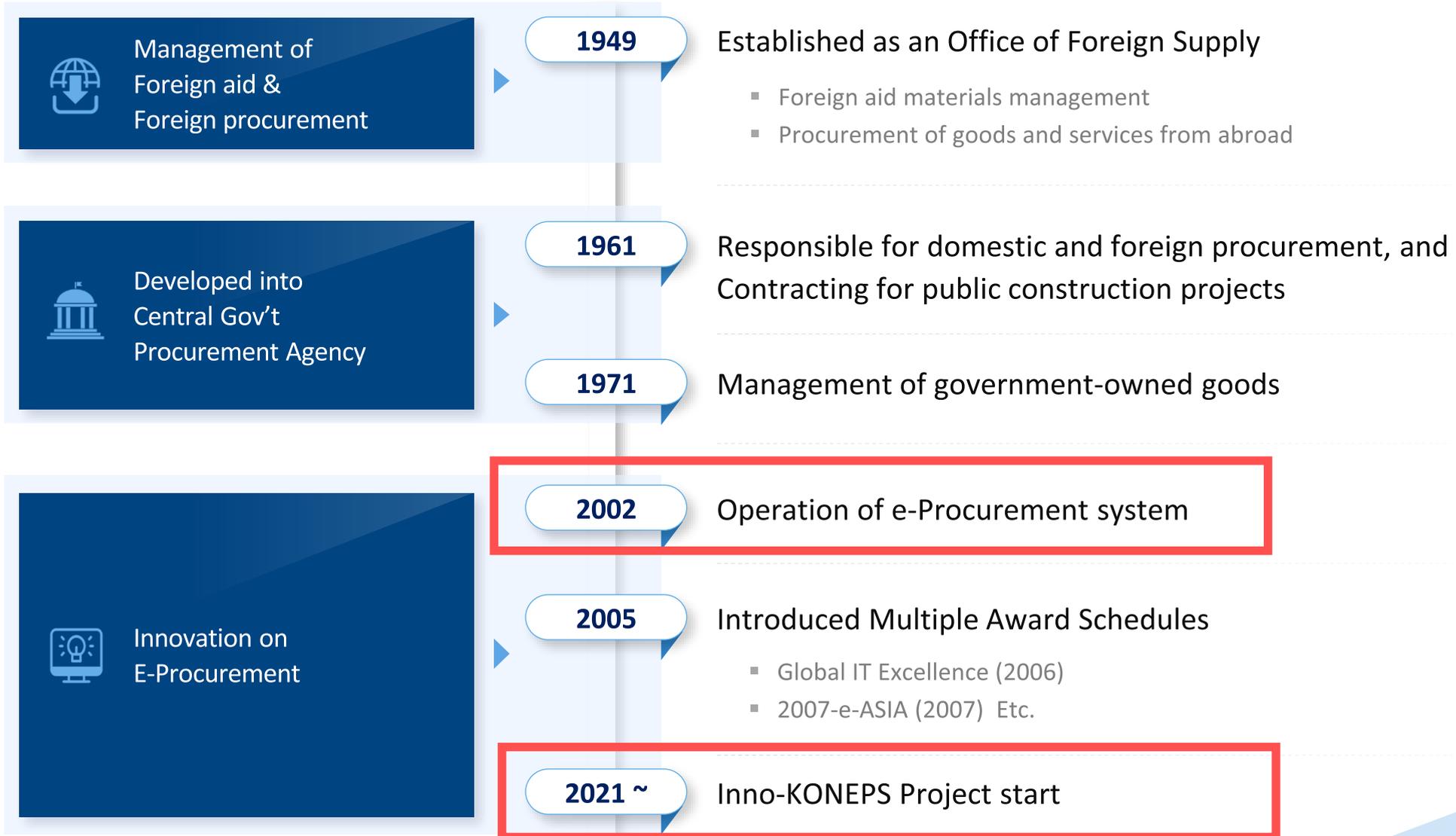
I Introduction to KONEPS

1. History of PPS
2. KONEPS?



I. Introduction to KONEPS

1. History of PPS(Public Procurement Service)



I. Introduction to Next-generation KONEPS Project

2. KONEPS : **K**orea **ON**-line **E**-Procurement **S**ystem

Launched in October 2002, annual transaction volume of 121.5 trillion won, 20% of the national fiscal expenditure

Pan-government Public Electronic Procurement System

- **A single window for public procurement** that electronically handles the entire procurement process
- Achieved costs savings of **8 trillion won** in annual procurement by converting procurement into electronic form
- Improved efficiency, transparency, reliability of the public procurement system in Korea



Electronic Government Procurement HUB

- **Annual Transaction 121.5 trillion won as of 2022** (Tripled from the time of establishment)
- Used by 66,000 public institutions and 536,000 providers
- 420,000 electronic announcements, 40 million bid participants, and 1.02 million electronic contracts.

II

Introduction to AI/Data Analytics Project

1. Project overview
2. Objective of Project
3. Data Analysis Framework
4. Schedule



II. Introduction to AI/Data Analytics Project

1. Project overview

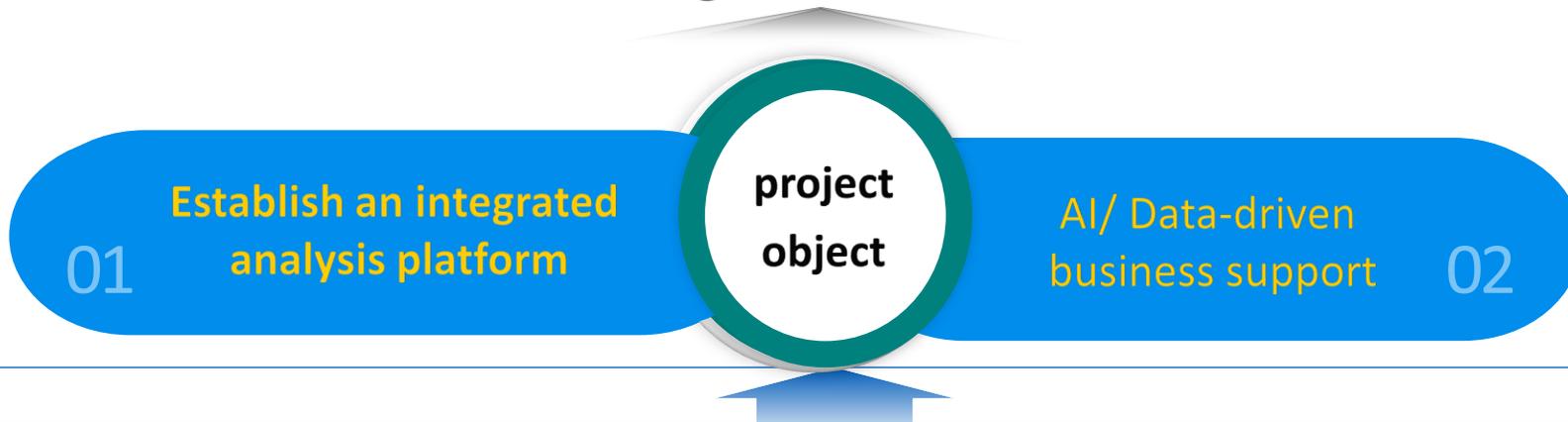
Implementation of next-generation KONEPS for [Data-based national procurement platform service](#)

Category	Description
Project Name	<p>The AI/Big Data Analysis project is a sub-project of the KONEPS project.</p> <p>* KONEPS : Next-generation Korea On-line E-procurement System</p>
Project Period	June 23, 2021 - June 2024 (36 months)
Project scope	<ul style="list-style-type: none"> • Discover analysis topic for business values & Pilot analysis • AI/Big data analysis • Implementing Analytics Applications • building a complete data and analytics platform
Project Operator	<p>SK C&C Consortium (SK C&C, VAIV Company)</p>

II. Introduction to AI/Data Analytics Project

2. Objectives of project

“Digital Platform Procurement service Made with Artificial Intelligence and Data



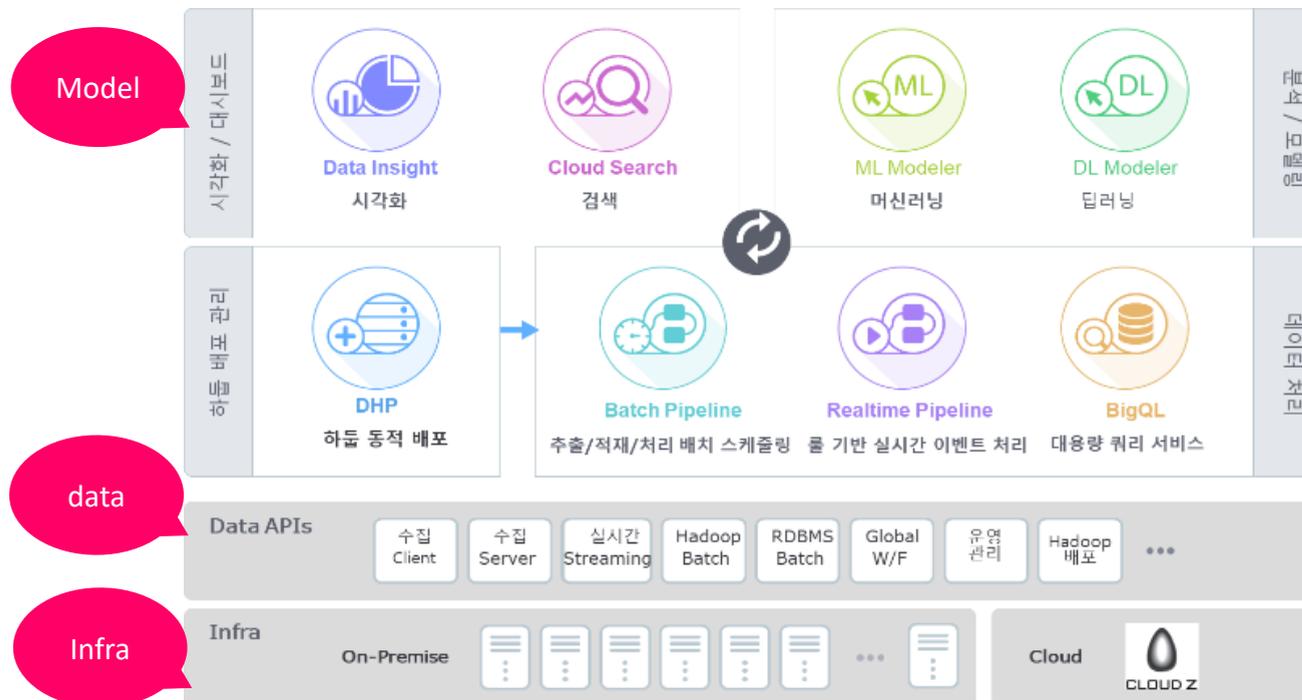
Establish an integrated analysis platform	process improvement	improve user convenience
<ul style="list-style-type: none"> to perform/manage overall analysis activities including data collection and pre-processing/modeling/deployment/monitoring etc.. 	<ul style="list-style-type: none"> Supplier Registration, Invitation for Biding , Bidding process intelietc. 	<ul style="list-style-type: none"> Customer service process support <ul style="list-style-type: none"> Identify key issues and trends through keyword analysis etc.

2. Objectives of this project

Building a AI/ Big Data Analysis Environment

Analysis Platform

Everything you need to analyze data in one place!



Key features

1 One-stop analysis Platform

- it supports various data source connections, pre-processing, modeling, and serving.
- Model monitoring and management

2 Data APIs

- easy-to-connect
- Various APIs
 - RDBMS, DW, Hadoop
 - snowflake etc

3 Dynamic infrastructure expansion

- On-premise & Cloud-based infrastructure
- multi-cloud support

II. Introduction to AI/Data Analytics Project

2. Objectives of this project

Example of applying AI/Data analysis by business process



Pain point

- Difficulty identifying **public Purchase Order Volume**
- Difficulty identifying **appropriate bidding announcements**
- Identify the **right sourcing products**



AI use case

- **Demand Forecast**
- bid announcement recommendation
- Product Search Keywords Analysis

- Increased **bidding congestion** at closing time
- Difficult to grasp the **product classification code** when registering a product



- **Bidding Congestion**
- Product Recommendation
- **product classification code recommendation**

- Many questions about **how to use the new system(KONEPS)**
- Identifying **complaints for a civil**

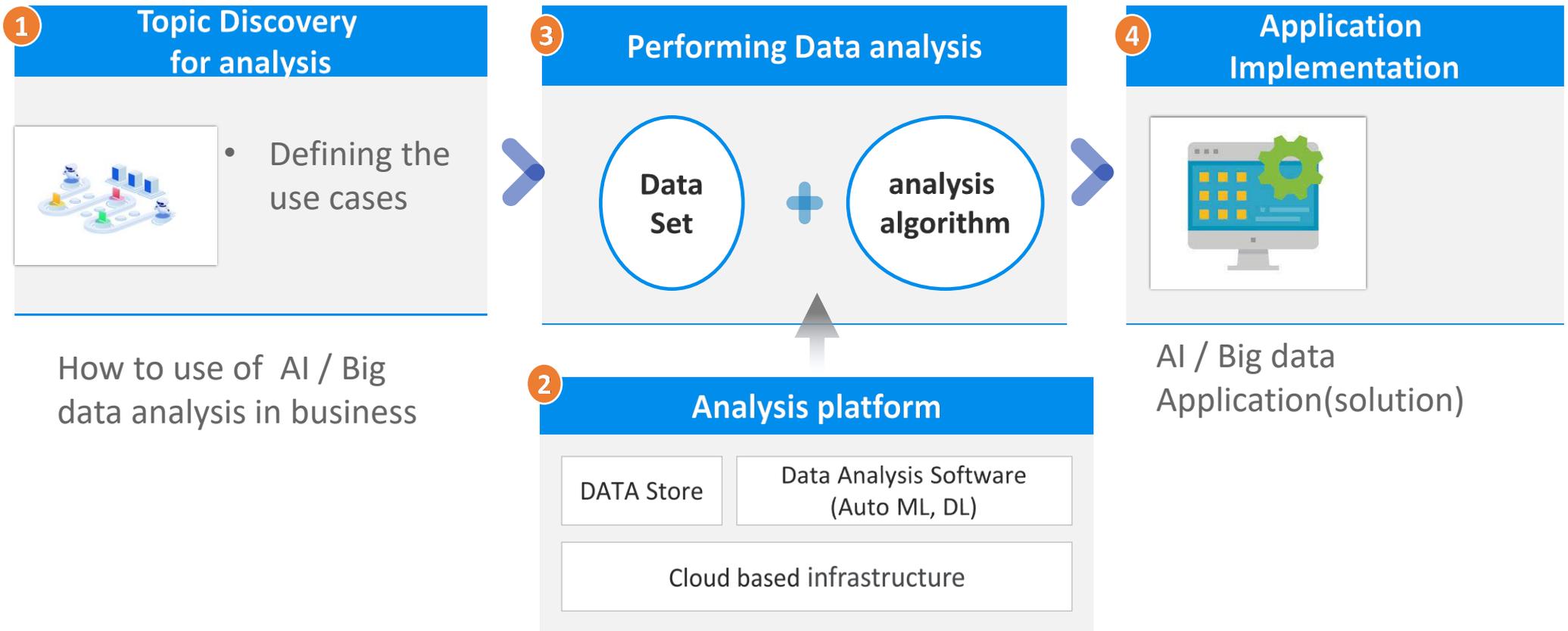


- **AI chatbots for customer Service**
- Keyword Analysis of Civil Complaints

II. Introduction to AI/Data Analytics Project

3. A Data Analysis Framework & Scope

A data analysis framework for better business decisions

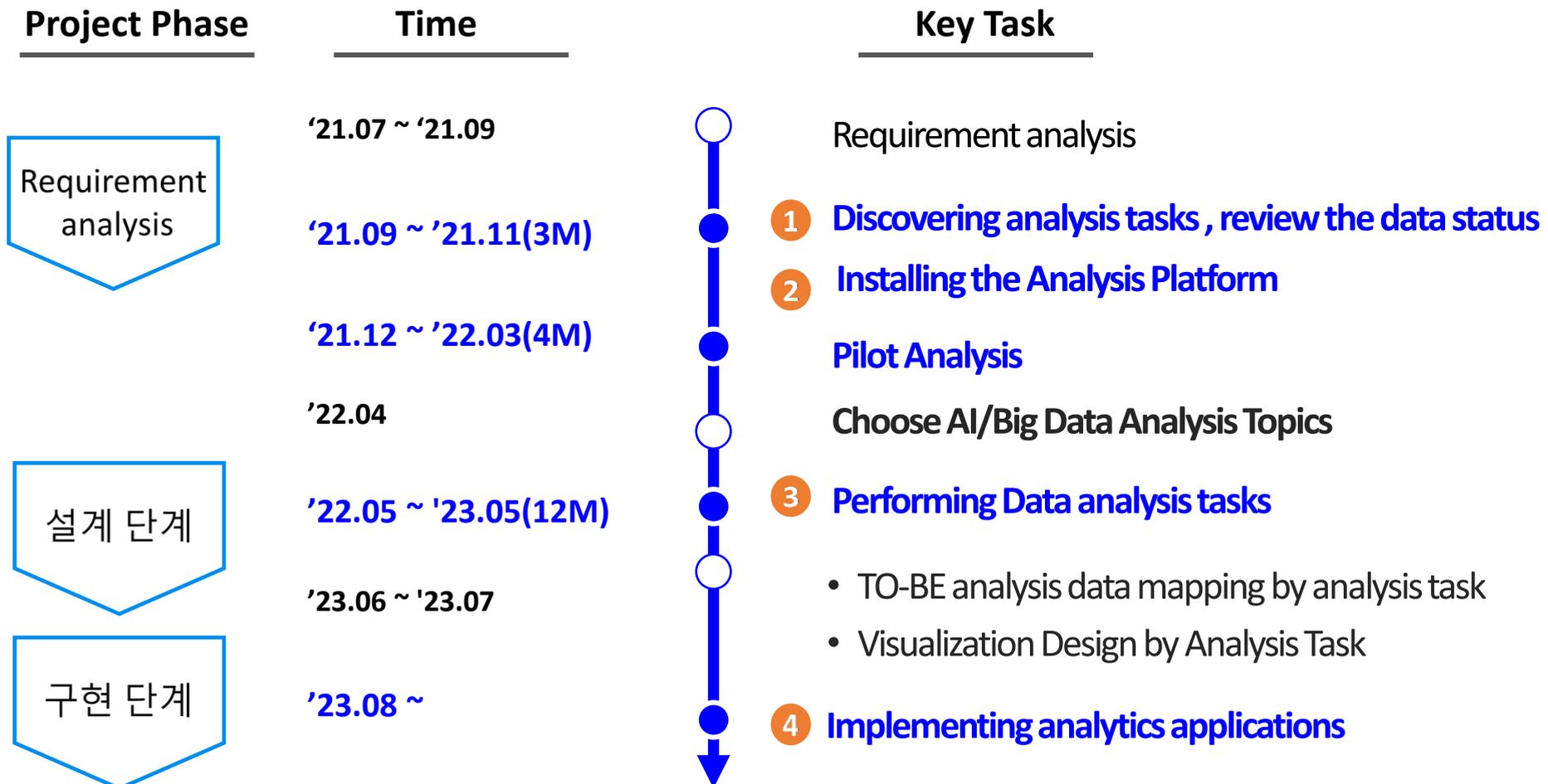


How to use of AI / Big data analysis in business

Everything you need
for data analysis in one place!

II. Introduction to AI/Big Data Project

4. Project Phase & Schedule



III

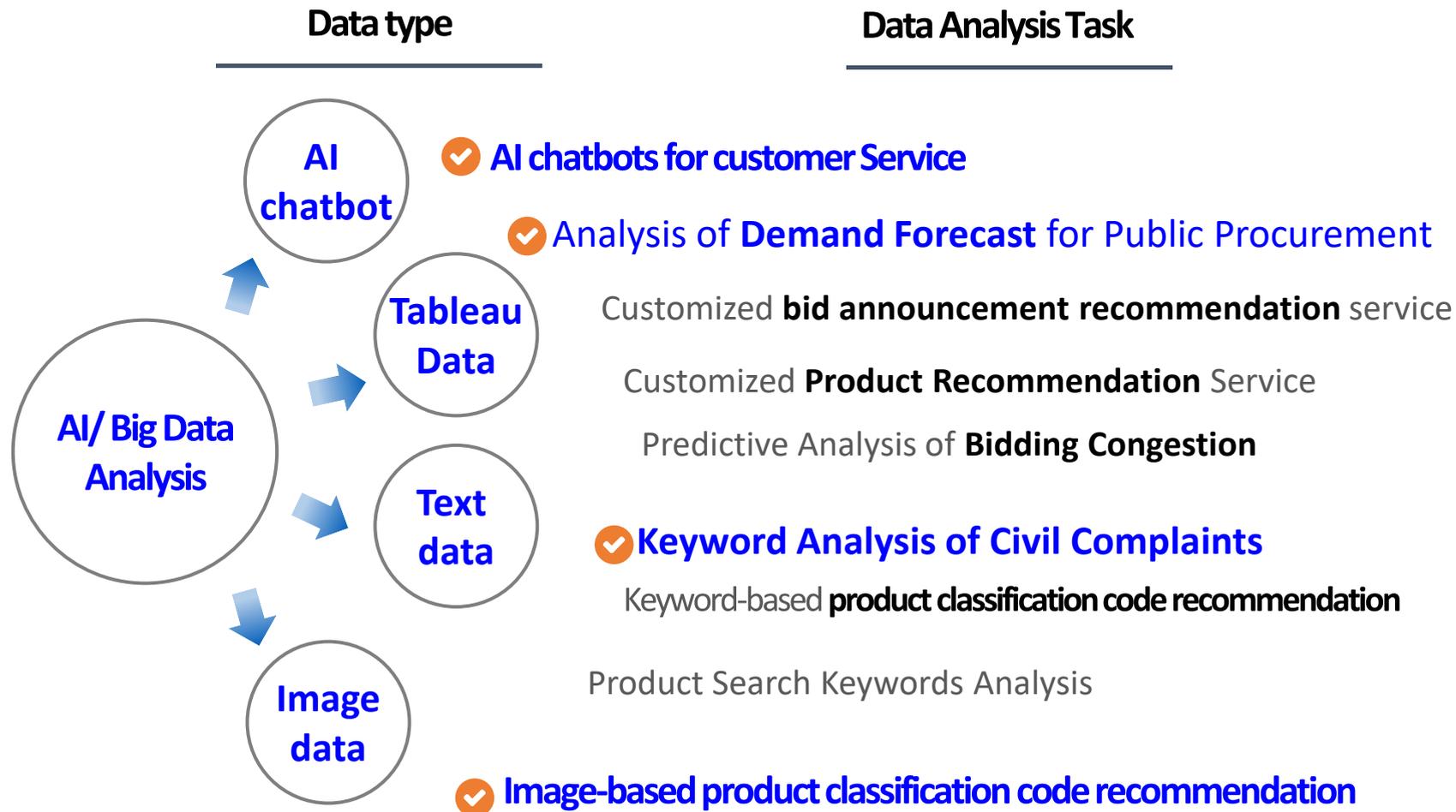
Data Analysis model & service

1. Analysis Task Overview
2. AI Chatbot
3. Forecast analysis
4. Text analysis
5. Image analysis



III. Introduction to AI/Big Data Analysis

1. Analysis Task Overview



2. AI Chatbot

AI Chatbot : how to use the “KONEPS” system

Pain Point



- Changes in **New and improved KONEPS** system
- Therefore, **Increasing inquiries on how to use** the system
- Increased **call waiting time** for KONEPS User

Give information about “how to use KONEPS”



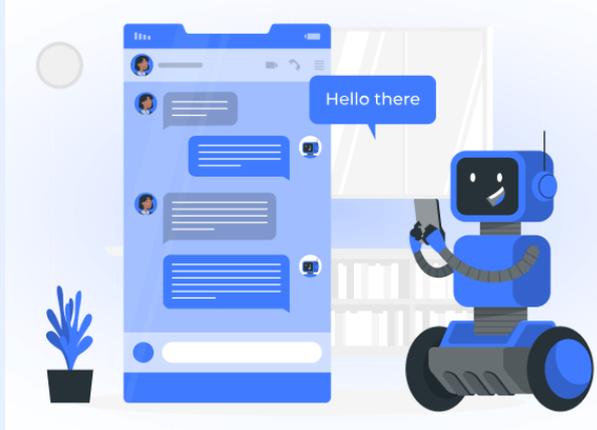
Customer service center

- reduces the **workload** for answering calls



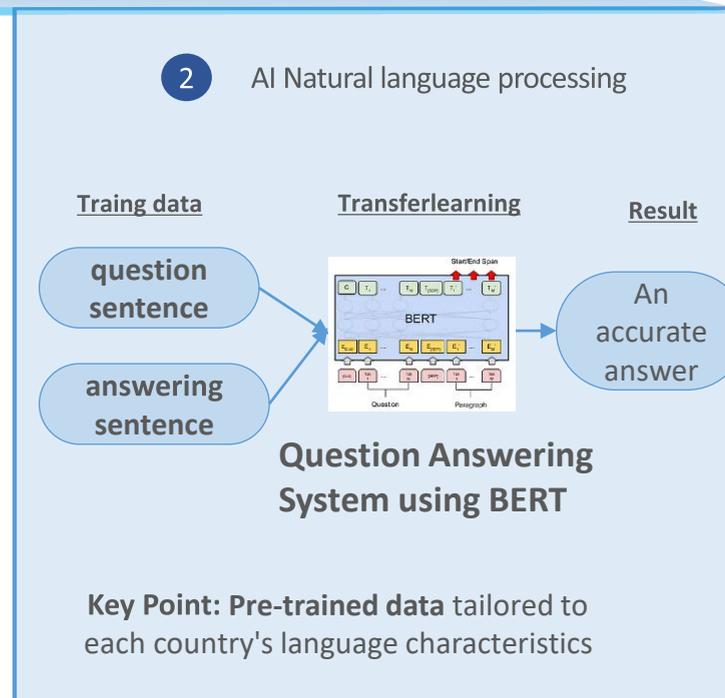
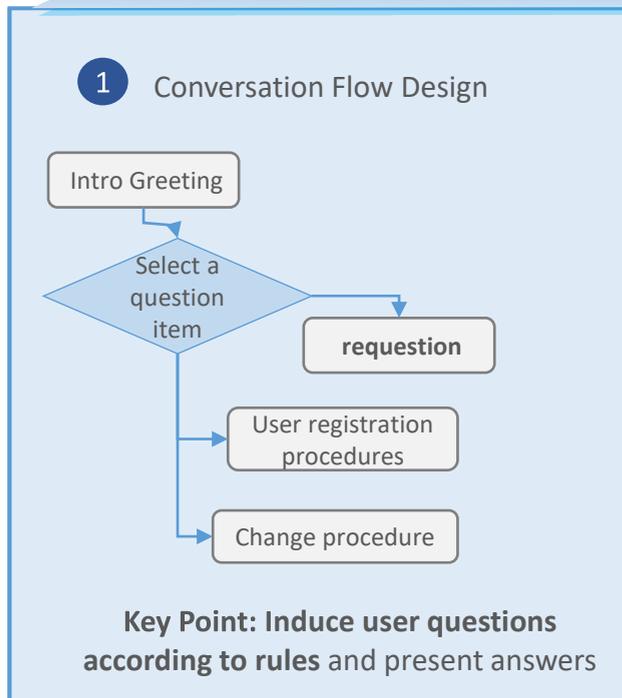
KONEPS System User

- Reduce **call waiting times**
- Answering common questions quickly use of KONEPS
- **Quick routing** to the right answer web pages



2. AI Chatbot

Scenario-Based AI chatbot Design to Enhance the User Experience



Key features

1 Convergence scenario and AI-based chatbot

Scenarios(Rules-based) chatbots

AI-powered chatbots

Menu or button-based chatbots

2 Designing user scenario-based Conversation models

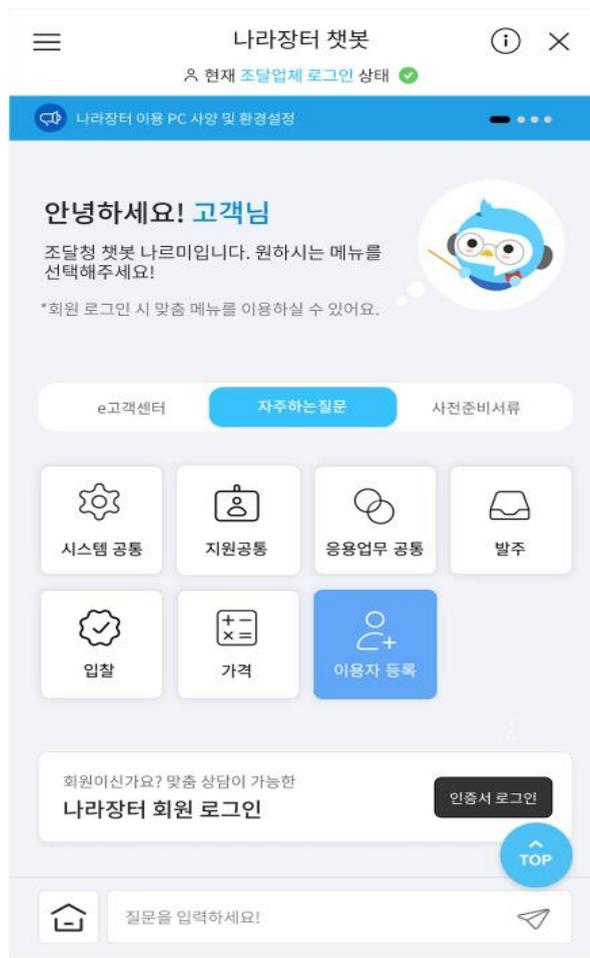
- Activity scenarios, information scenarios, interaction scenarios etc.

3 Pre-trained Korean language data

- Required for accurate questioning intentions and answers

2. AI Chatbot

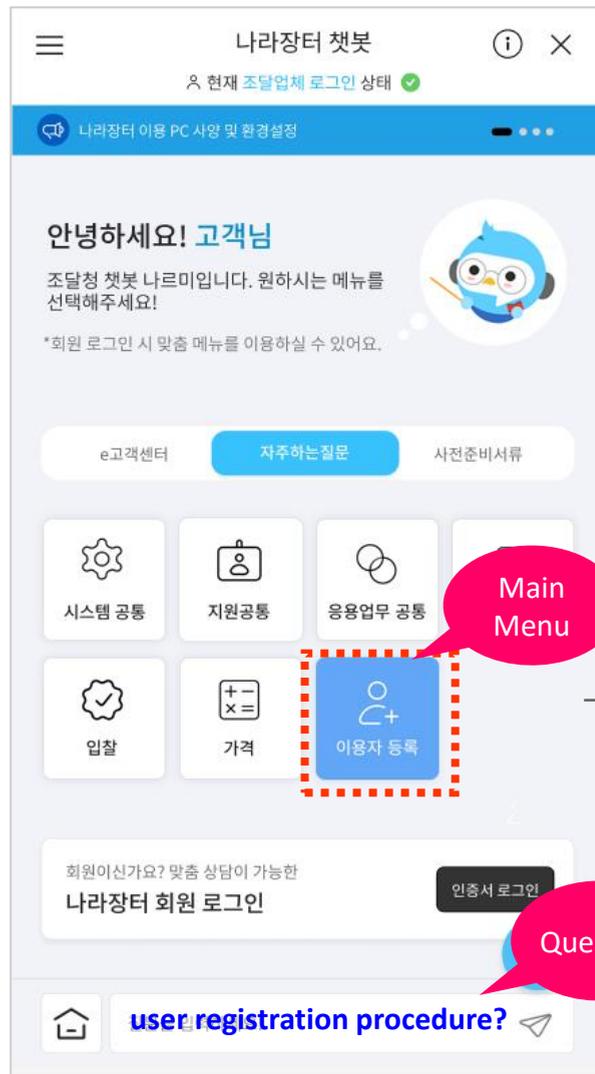
Chatbot UX Design



Key features

- Menu, Title, Login status
 - Rolling announcements and events
 - Public Procurement Service characters
 - quick menu
- 1 **Menu or button-based chatbots**
Streamline navigation
 - 2 **Rules-based chatbots**
Easy of use & When don't know the question sentence
 - 3 **AI-powered chatbots**
Enter a question sentence
- Login Button

2. AI Chatbot



button-based
Navigation

Main
Menu

AI-based
navigation

Question



Sub
Menu

Answer

3. Forecast analysis : Data-based planning support

Forecast of public purchases by region & items traded on KONEPS

Pain Point



Supply company

Difficulty **identifying** public purchase order volume

- Difficulty in **business promotion plans**
- Difficulty in **supply plans**
 - Workforce plans
 - Raw material purchase plans

Use case

Data-based planning support



Demand organization

- timely delivery guaranteed



Supply company

- Use the data in establishing **business promotion plans** for the next quarter or year
- Use the data in establishing **supply plan for Workforce**, equipment
- To ensure continuous **replenishment** of finished goods & Raw material

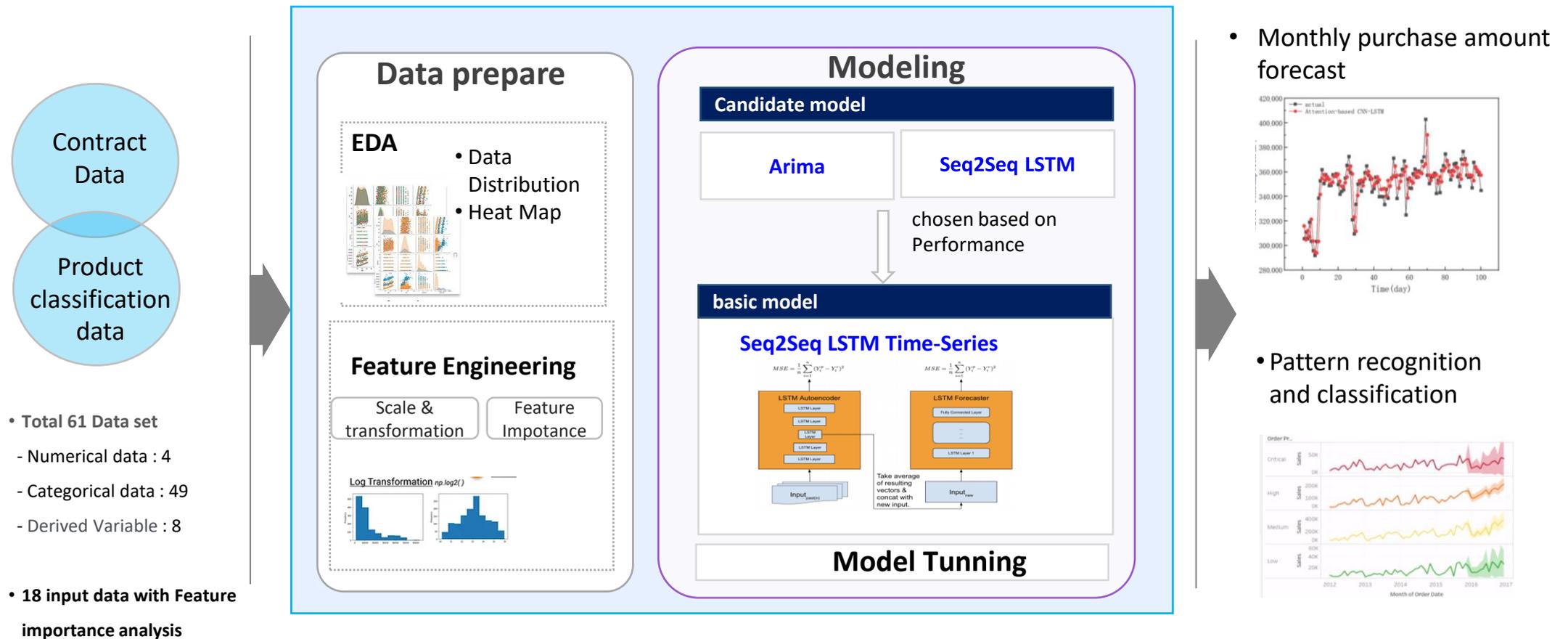


3. Forecast analysis : Data-based planning support

Data Source

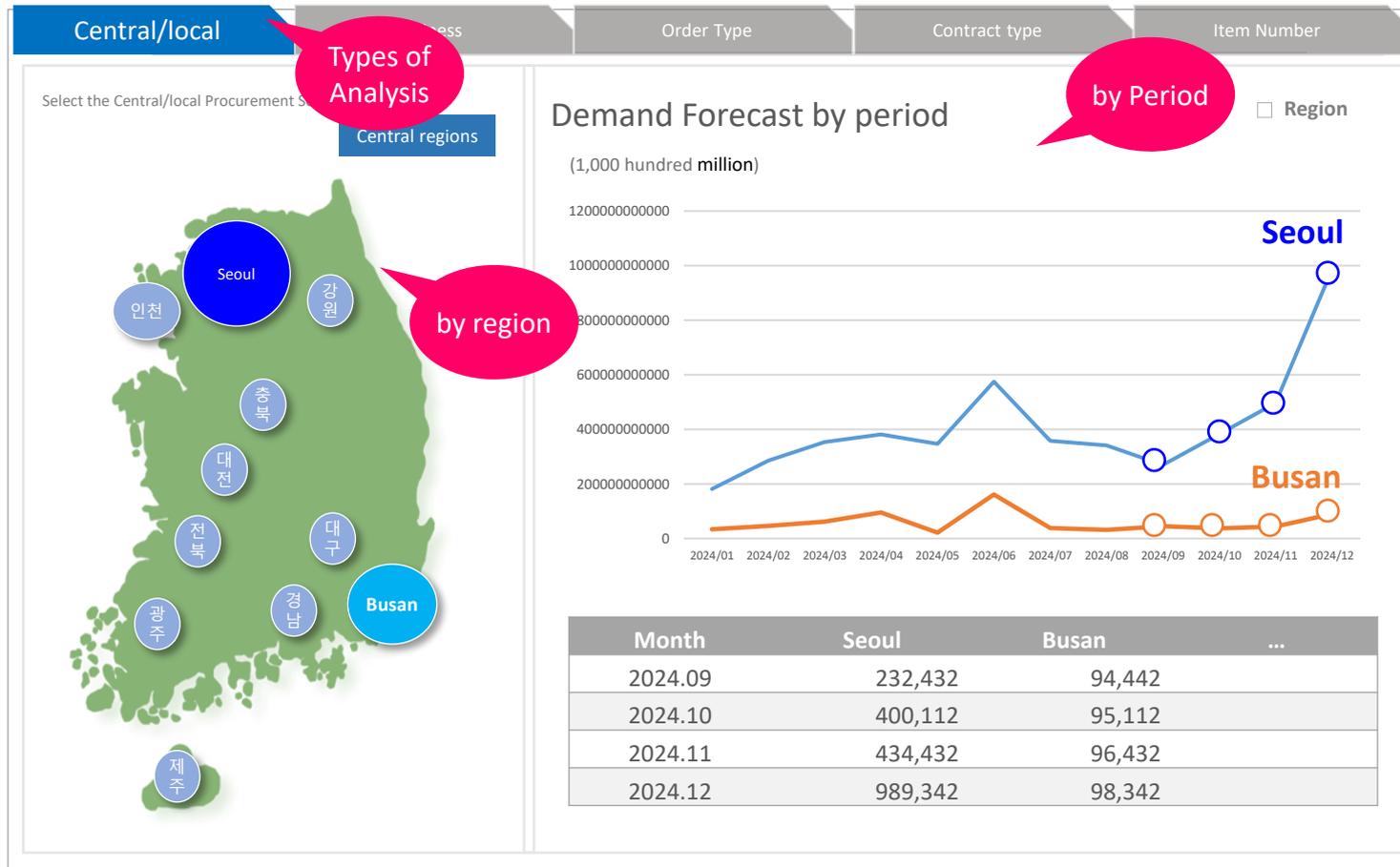
Analysis Process

Result



3. Forecast analysis : Data-based planning support

Data-based planning support Application



Key features

- 1 Selecting Statistics View**
 - Selecting Statistics View by Business, Order type..
- 2 Demand Forecast by region**
 - Forecast by Administrative Regions in Korea
 - Use to prepare Regional supplies
- 3 Demand Forecast by Period**
 - The Graph show the statistical forecast by Seq2Seq LSTM model result
 - Weekly , Monthly forecast

4. Text analysis : Key word analysis

Sopping keyword & complaint keyword Analysis

Pain Point



Supply company

- difficult to identify **customer preferences product** & trend for promotion



조달청
Public Procurement Service

- Difficulty in **comprehensively identifying** complaints from **various channels** & identifying the type, trend, and frequency of complaints

Market-oriented supply/demand system



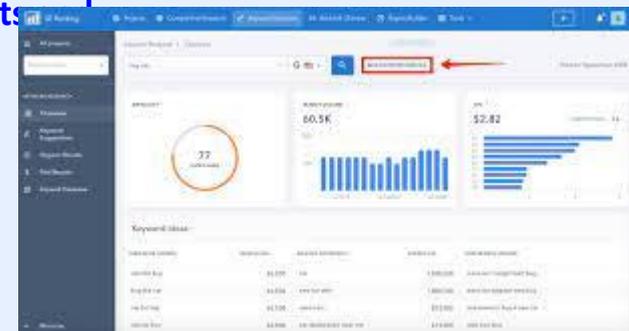
Sopping keyword analysis

- Find out the **trend** of purchasing products
- Use for **promotion**
- Use it for **sourcing favorite products & suppliers**



Complaint Keyword analysis

- Identification **of complaint factors & Ranking**
- Use to **improve** procurement service



4. Text analysis : Key word analysis

Shopping Mall Search Keyword analysis Application



Key features

1 key word analysis - Frequency

- Analysis of Product Keywords with **High Search Frequency** in Shopping Malls

2 Utilize keyword analysis data

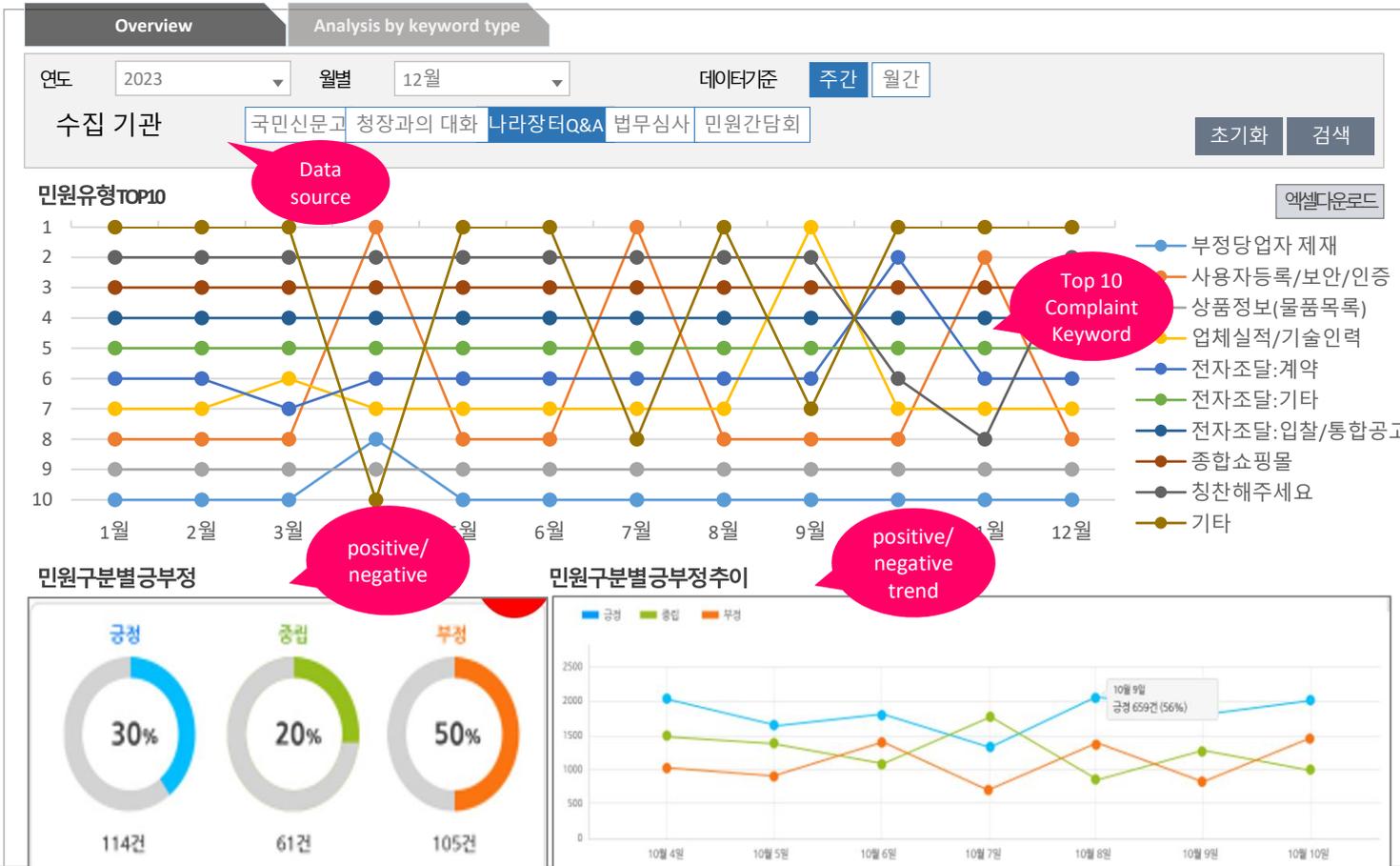
- **Discover** highly searched products and suppliers
- **Recommendation** of high-searching Demanding institutions to Suppliers

4. Text analysis : Key word analysis

Public Procurement Service complaint Keyword analysis Application

1

Key features



1 key word analysis - sentiment

- From extracting keywords or entities to classifying text by sentiment(Positive / Negative)

2 Utilize keyword analysis data

- Complaints concern inconveniences
- they are important data not only for **procurement policy** but also for decision-making **to improve procurement service**

5. Image analysis: product classification code recommendation

Pain Point



Supply company

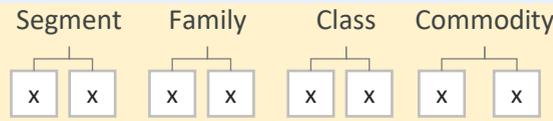
Difficulty **identifying** public purchase order volume

- Goods need to be **pre-registered** in the **product information system**
 - for product contracts, shopping mall registration, etc
- Difficulty in know product classification code
 - Workforce plans
 - Raw material purchase plans

Use case

Convenience of product registration

Product Classification Standard



- 8 digits, level 4



Supply company

- Easy of use : If **enter the product image**, can **know the product classification code**.
- Improved product classification code input accuracy

The screenshot shows a web interface for image analysis. At the top, there's a 'Select Image' field with 'Gogo.jpg' and an 'Image Upload' button. Below that, there are two tabs: 'Image Analysis' and 'Restricted Category Analysis'. The 'Image Analysis' tab is active, showing a tree view of product categories. The tree is expanded to '10101504 Children's desk chairs', which is highlighted with a red dashed box. Below the tree, there's a 'Similar Product Images' section with the text 'If you don't have the image you want, search again for category only'. This section displays four product images with their classification codes and similarity percentages: 'Gaming Chairs 9912391301 80.11%', 'Desk Chairs 9912391301 82.31%', 'Desk chairs 9912391301 83.14%', and 'Children's desk chairs 9912391301 85.11%'. The 'Children's desk chairs' image is highlighted with a red dashed box.

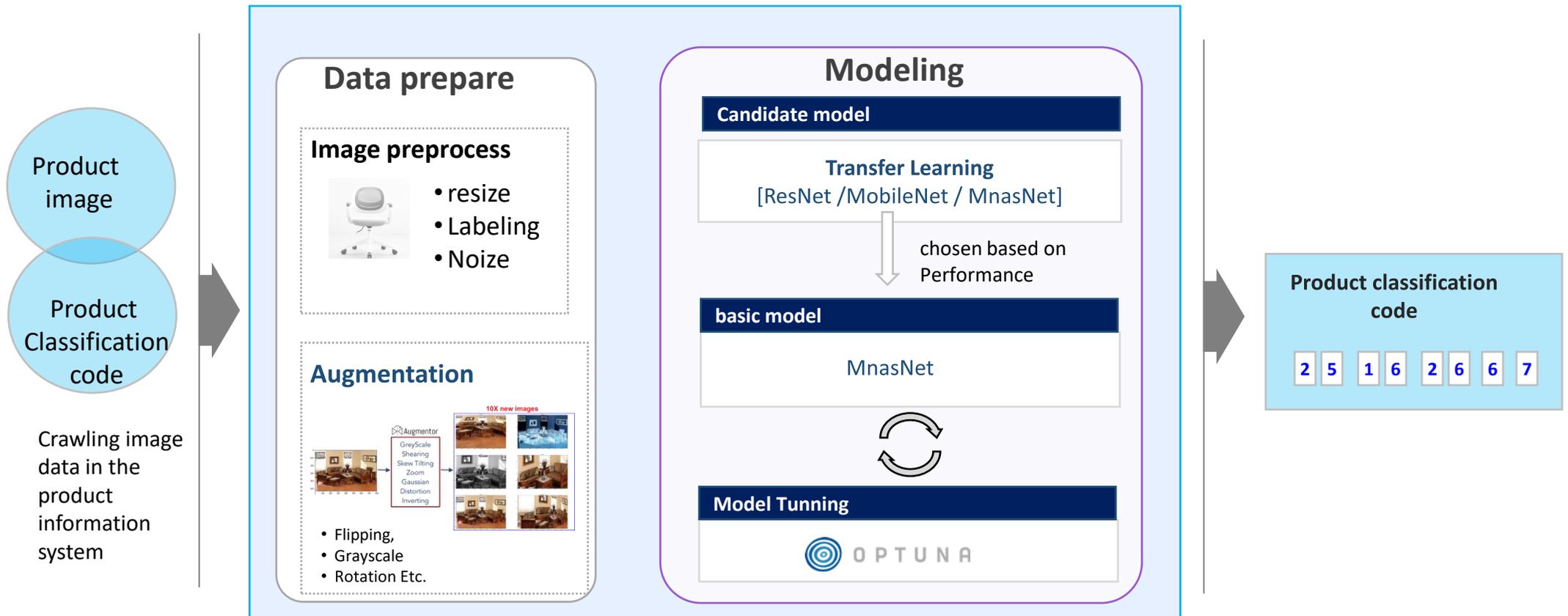
III. Introduction to AI/Big Data Analysis

5. Image analysis: product classification code recommendation

Data Source

Analytical Process

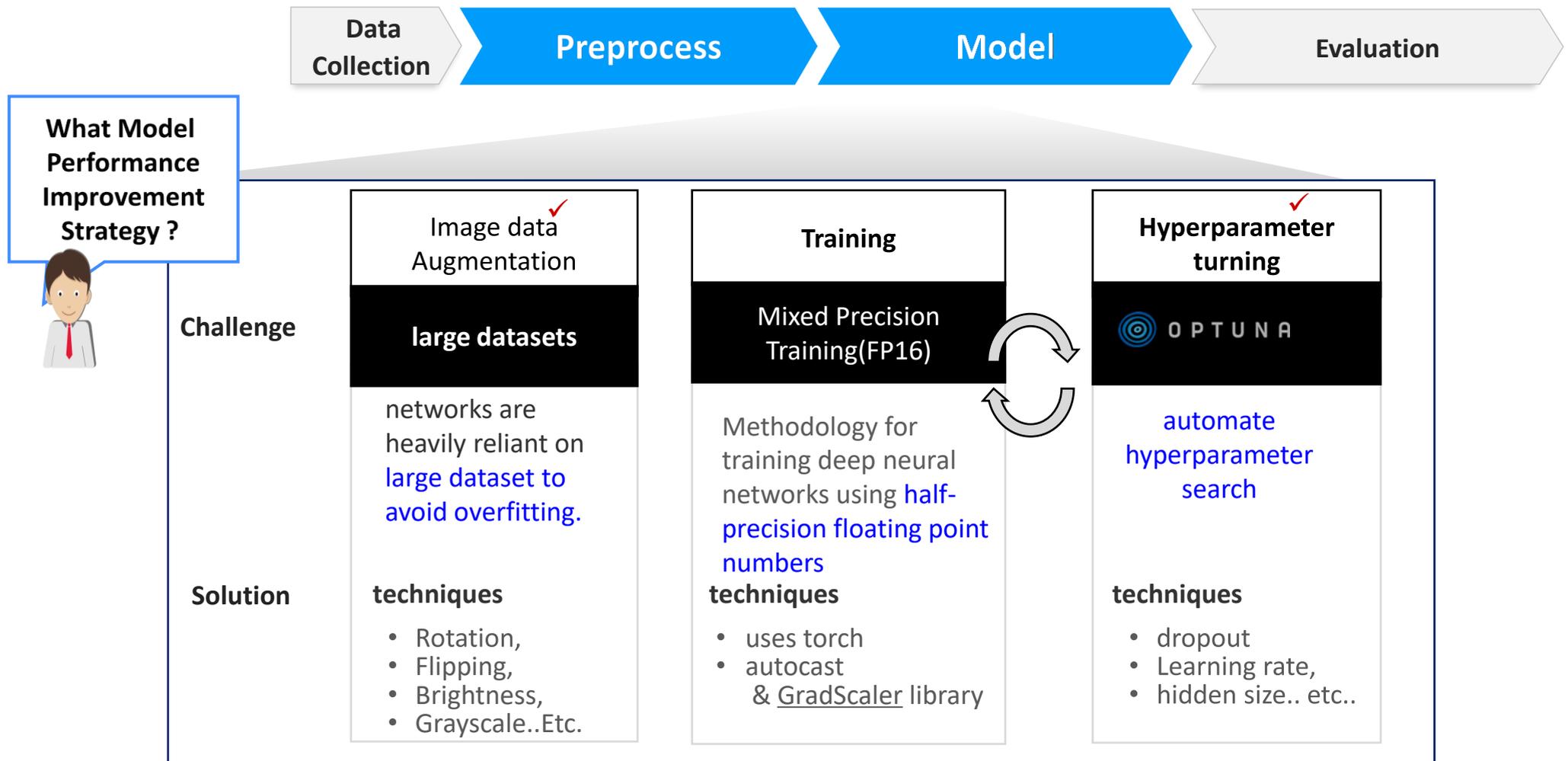
Result



III. Introduction to AI/Big Data Analysis

5. Image analysis: product classification code recommendation

to increase the performance of accuracy , apply various techniques



5. Image analysis: product classification code recommendation

product classification code recommendation Application

Key features

Image files cannot exceed 10MB. Only JPG images can be uploaded.

1 Select Image

2 Image Analysis | Restricted Category Analysis

2 analysis method

- furniture
 - office furniture
 - Chairs
 - Desk Chairs
 - 10101504 Children's desk chairs**
 - ...
- Sofas

3 similar image search

Similar Product Images
If you don't have the image you want, search again for category only

Gaming Chairs 9912391301 80.11%	Desk Chairs 9912391301 82.31%	Desk chairs 9912391301 83.14%	Children's desk chairs 9912391301 85.11%

Result

- 1 Enter an image**
 - Enter an image of an unknown product classification code
- 2 Choose Analysis Method**
 - Image Analysis
 - simple image analysis
 - Restricted Category Analysis
 - After entering an image, the user selects a classification system
 - increase classification accuracy
- 3 Product classification code analysis & results**
 - Presenting product classification codes for images similar to input images

Q&A

Thank you!

