



Forge ahead with Data Democratization to achieve Digital Transformation with KNIME

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- YAMAHA Motor is forging ahead with data democratization and **has trained a total of more than 1,500 employees with KNIME every year.**
- **KNIME is effective for training citizen data scientists** working in YAMAHA because it is easy to operate and get insight from their business data.

1. Introduction

2. Data analysis platform and use cases

3. Inhouse data analysis training with KNIME

4. Examples of data analysis by citizen data scientists

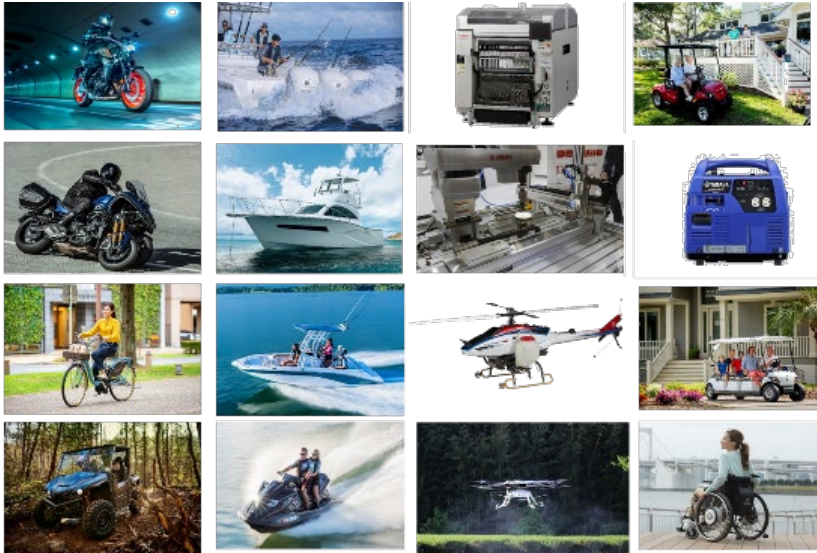
5. Conclusion



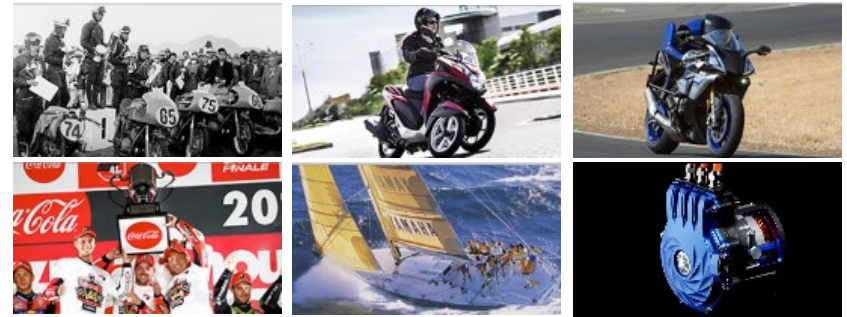
Introduction

What is Yamaha Motor's DX
strategy ?

Wide variety of products



Challenging corporate culture



We are a “KANDO” creating company



Corporate Mission

A KANDO CREATING COMPANY

*Kando is a Japanese word for the simultaneous feelings of deep satisfaction and intense excitement that we experience when we encounter something of exceptional value. It is the special form of excitement and satisfaction we call Kando.

Products & Services

Experience

KANDO



Digital Transformation is not a Goal

Digital transformation is not about "Digitization".
To **"transform"** the business into a state where digital **"also"** can be successfully utilized.



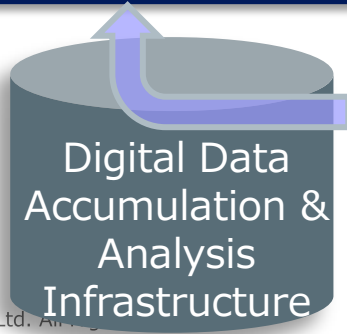
Yamaha's
Unique Weapons × Data Utilization

Management and Business Execution

Head Office – Oversea Bases
Various Businesses
Various Departments



Global Core Integrated Database



Digital Data Accumulation & Analysis Infrastructure

Digital Business

Customer and Market Information
Manufacturing Information
Connected Information

Our goal = Democratization of Data Analysis

Aiming to be a company where all employees can utilize data as a matter of course

Yamaha Motor Strengths

People with passion and desire. Free and open corporate culture

subject

creativity

will

data

Tools to enhance strengths and adhesive

objectivity

reproducibility

reasonability



Data Democratization

Data Analysis Platform and Tools

Problems with data analysis for businessperson...

How can I import cleansed data?



How do we get insight and analyze data?



I need ample computing resources to analyze big data.



Data Analysis Platform

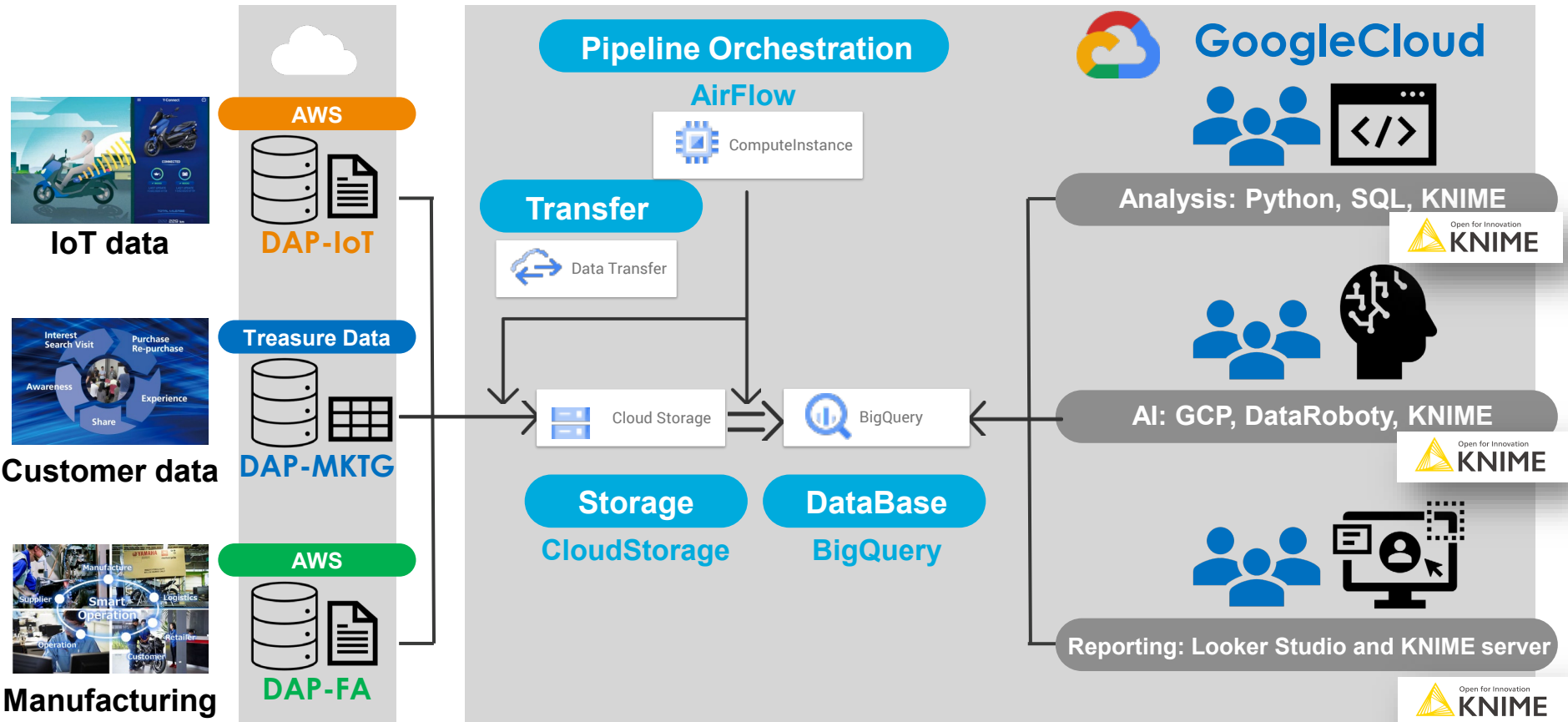


Data Analysis Training



Digital Strategy Division

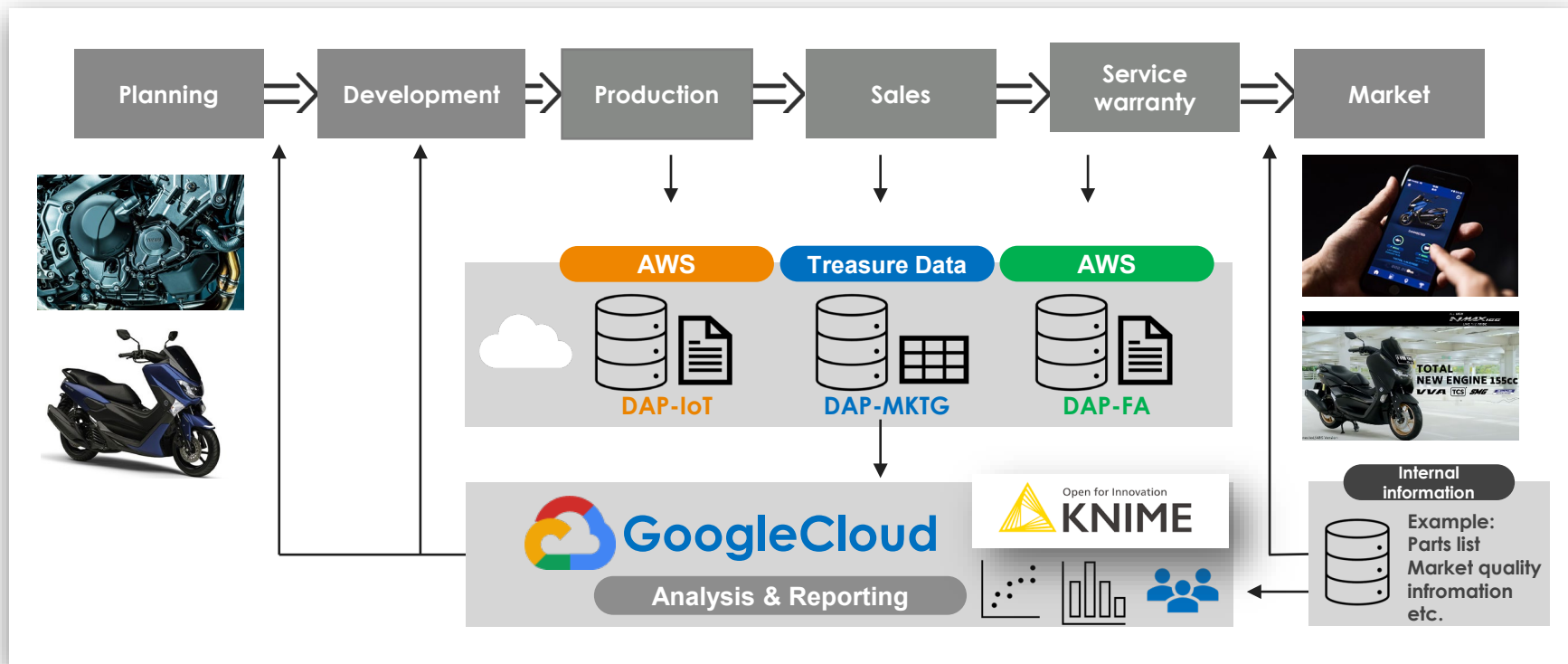
YAMAHA's Data Analysis Platform



Over 1200 KNIME analytics users in YAMAHA

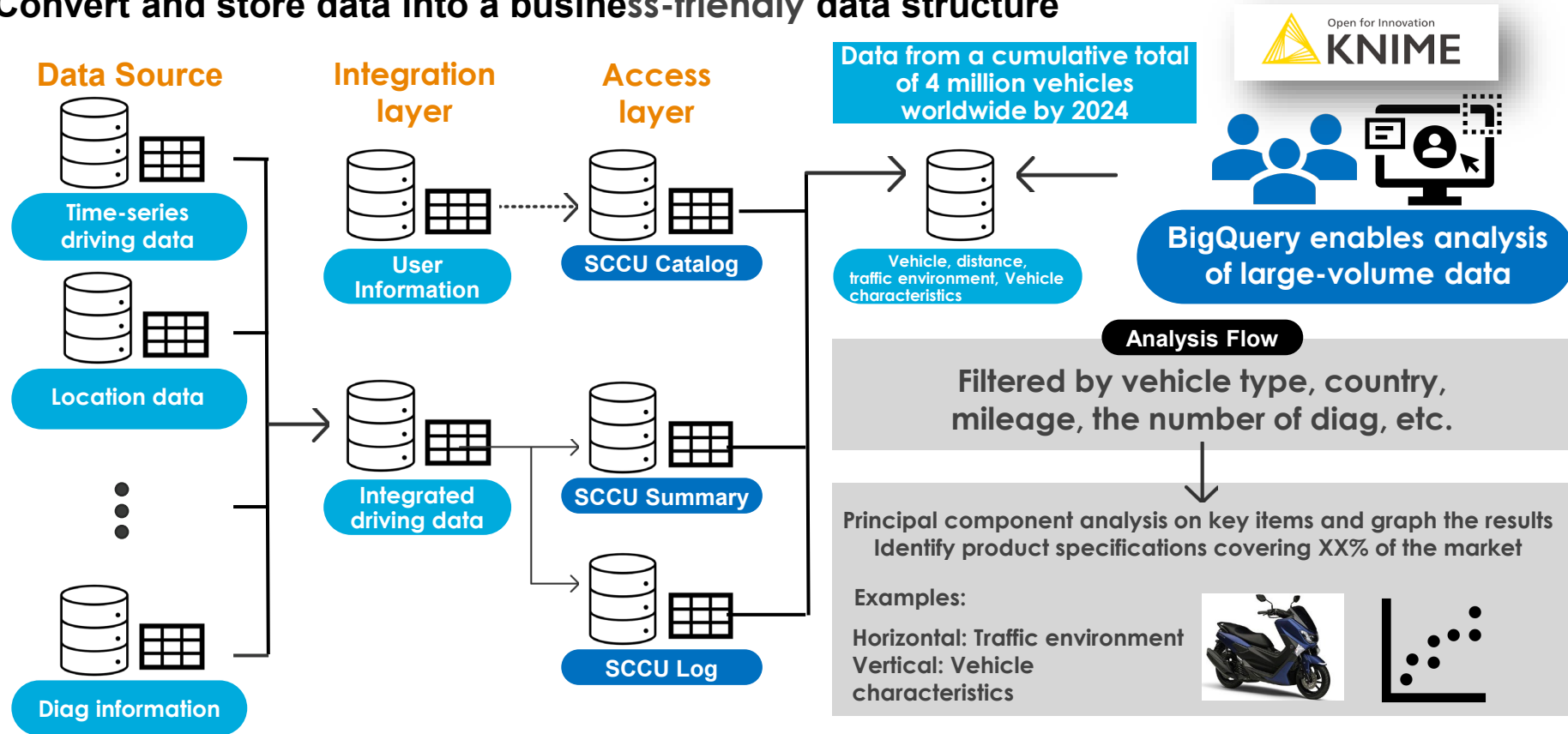
Key Areas of Data Utilization

Applied across the entire value chain, **real-world examples of data analysis are presented.**



Data Structure of Data Analysis Infrastructure

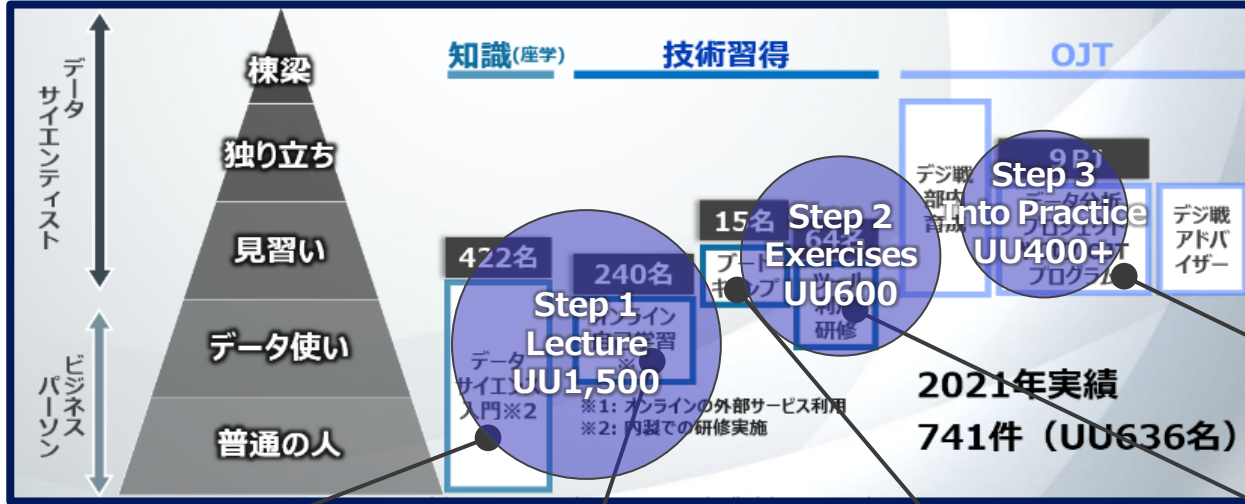
Convert and store data into a business-friendly data structure



Data Democratization

Data Analysis Training with **KNIME**

Data analysis training for employees based on different objectives and levels of difficulty



Expand easy-to-use tools

■ Introduction status of AI tool called DataRobot

- Tools to automate machine learning without expertise
- 57 departments (Gr units) in the company, about 200 people are currently using the system.



57 Divisions	197 Unique Users
6,000+ Projects	100,000+ Models

Lecture for Beginners

Learn the Basics

- What analysis can do (in-house case study)
- Analytical Approach (Statistics, Machine Learning)
- Successful analysis plan
- Personal Information
- Outside Expert Speakers

Exercises for Data Users

Someone who has learned the basics exercises Python, etc

- Python Basics
- SQL Basics

Exercises for Apprentices

Utilizing data from the field and exercises practical analysis

- Quality analysis
- Marketing analysis

Exercises for Apprentices

Exercises to master the actual analytical tools.

- Google Cloud Training
- Data Robot Training
- Alteryx Training
- KNIME Training

Practical Experience

Having CoE as OJT so that employees can face the challenges in their own department

Installing the Low Code Tool for the Training

Data preprocessing
Large amount of Excel
data
Complex macro



Learning coding
languages is tough to
solve challenges.
Spells?

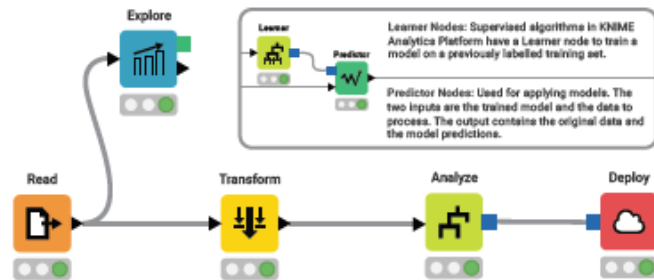
The next step is a
big hurdle even in
the introductory
course

```
import win32com.client
def print_qr(data):
    doc = win32com.client.Dispatch("bpac.Document")
    doc.Open(r"C:/Program Files/Brother bPAC3 SDK/Templates/カンファレンスQRコード.lbx")

    doc.GetObject("バーコード2").text = data

    doc.StartPrint('hoge', 0x0)
    doc.PrintOut(1, 0x0)
    doc.EndPrint;

#print_qr("test")
```



Promote KNIME to enable everyone to
perform data analysis

- Promoting the low-code data analysis tool “KNIME”
- No permission with IT administrator required
- Installable from the software center of YAMAHA. It's **Free**

In 2022, KNIME rapidly spread throughout the
company



- Over 1500 people have participated KNIME training,
it is running on over 1200 computers at YMC

Result

2022: 1,004 units (UU.742)
 2023: 2,300 units (u.u. 1,500)

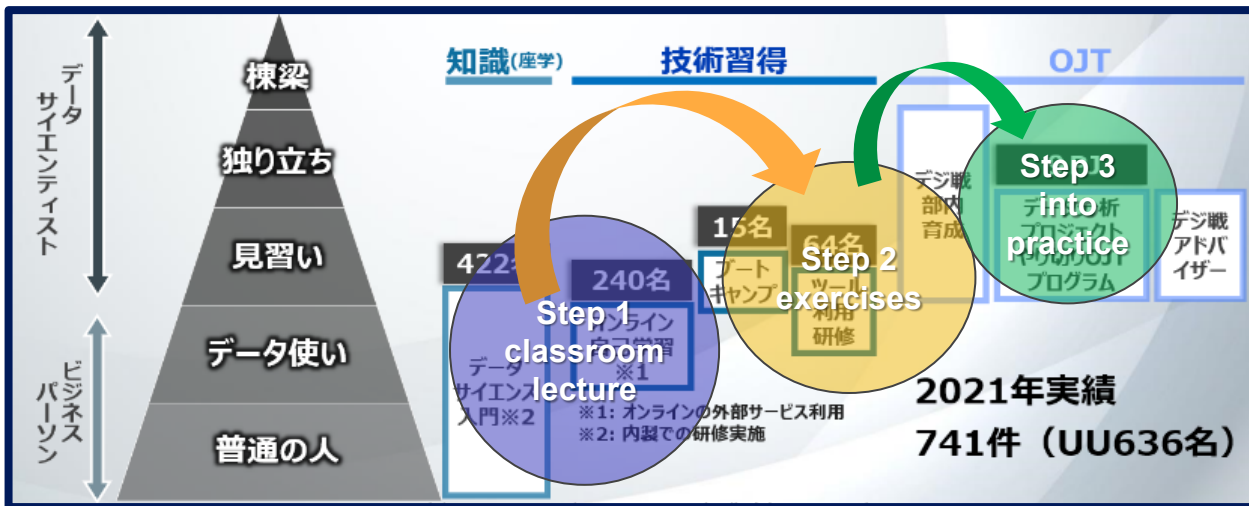


classroom



Hands on training

- Especially, **the KNIME course**, one of the training courses, led the increase in participants. **511 employees attended the course.**
- Popular courses shifted from knowledge-based to hands-on. It was a year in which the entire body of participants made significant progress towards **advancing to the next stage.**



*Reference:
 KNIME is a data analysis tool for beginners. It allows data analysis primarily through mouse operations.

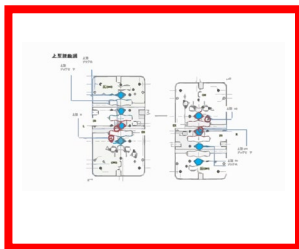


Data Democratization

Use Cases Created by Citizen Data Scientists.

Alignment of **analysis results** with **on-site feedback** facilitated rapid improvement (approximately 1 week).

Decision on Targeted Measures



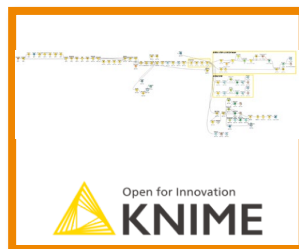
Shrinkage defects of a LP casting machine were occurring frequently since the end of the year.

Data Collection



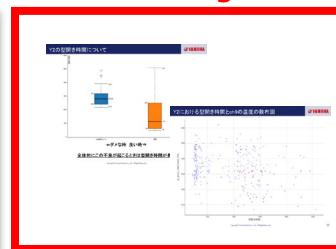
Data was collected from periods of normal operation and periods with frequent defects

Analysis



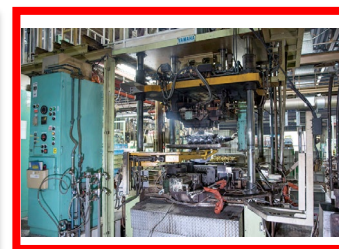
Data was processed and analyzed to identify the causes of defects.

Analysis Results Meeting



Compared the analysis results with the experience of skilled casters, and considered countermeasures.

Implementation of measures



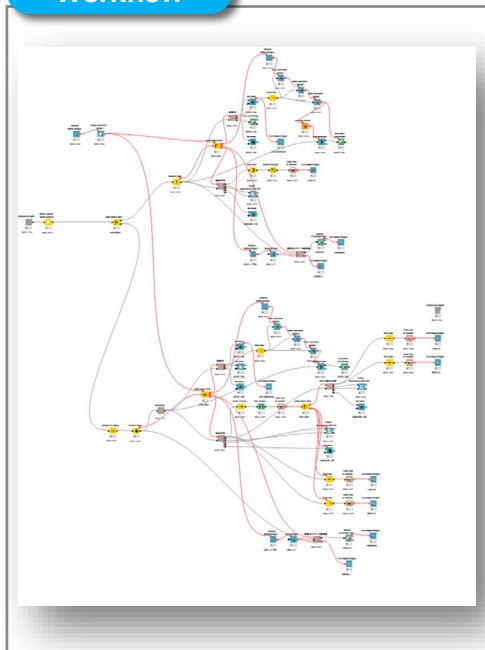
Improvement activities were conducted based on results supported by both data and good intuition of experienced employees.

memo

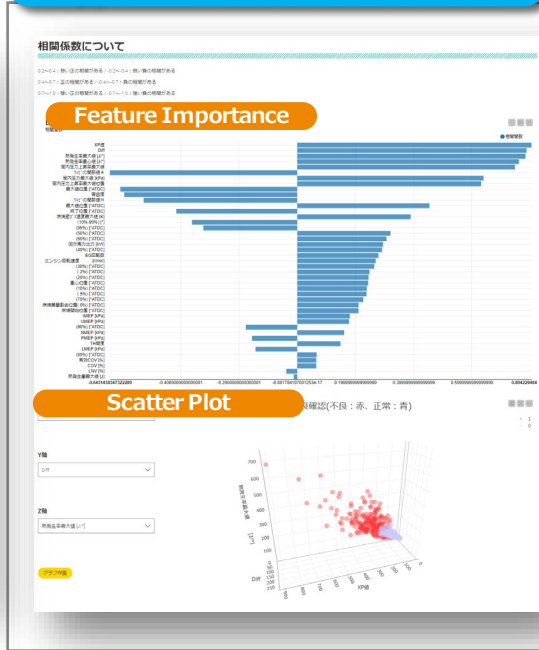
- Achieved through **collaboration** with the PT Aluminum Technology Department of the Manufacturing Technology Division, who are familiar with the on-site challenges.
- Rapid improvement was achieved by proceeding with activities based on **objectives** rather than means.
- Instead of relying solely on intuition of skilled staff, measures **were backed by data** to ensure credibility.

Factor analysis application for LP casting defect detection using the **KNIME server**

Workflow



Application GUI on KNIME server



相関係数について

0.2~0.4 : 弱い相関がある
 0.4~0.7 : 相関がある
 0.7~1.0 : 強い相関がある

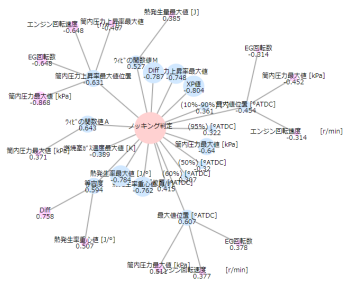
表示する相関閾値

0.3

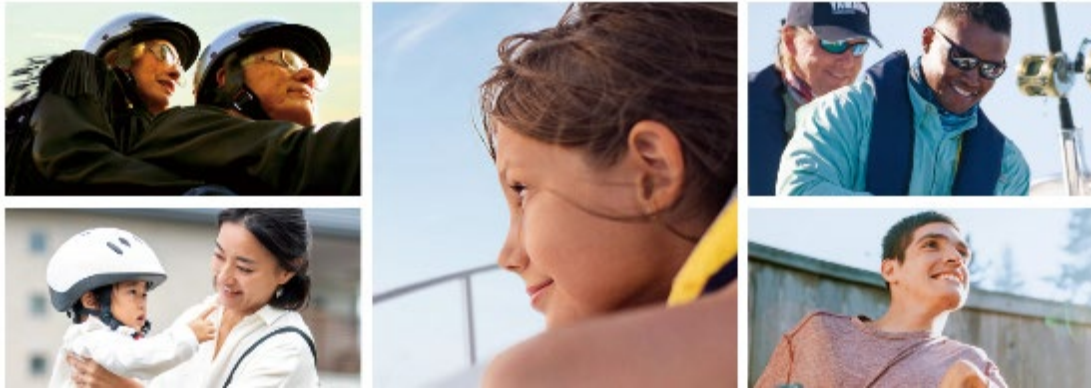
相関係数決定

相関閾値
 内の大きさを相関の強さ

Correlation Diagram



Conclusion



As a **Center of Excellence** in data analysis, our team of data science professionals employs a diverse range of data analysis methods, including AI/ML, to **address and enhance various challenges** and develop predictive models. At the same time, we actively foster the growth of in-house data scientists and advocate for **the democratization of data analysis throughout the company.**

Reference : [Yamaha Motor Integrated Report2023](#)

