UBIC's AI-based Technology

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JPX 東証マザーズ上場

UBIC Nasdaq Listed

http://www.ubic.co.jp

The elements of UBIC's AI

Landscaping

How can we help the AI learn efficiently and make correct judgments?

Behavior Informatics

How can we help the AI learn more about our world?

Small quantity of input - sort out big data

Landscaping UBIC

Training Data

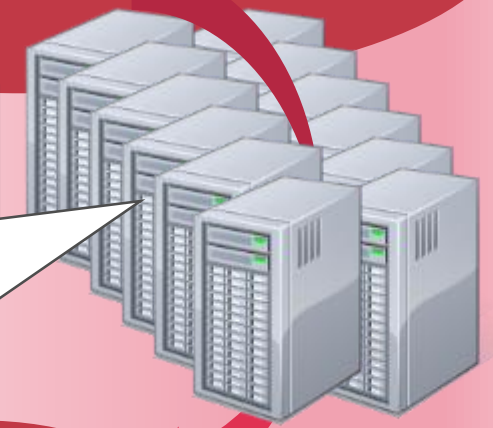
Ecologically friendly, palm-sized AI

Output

Conventional Technology

Training Data

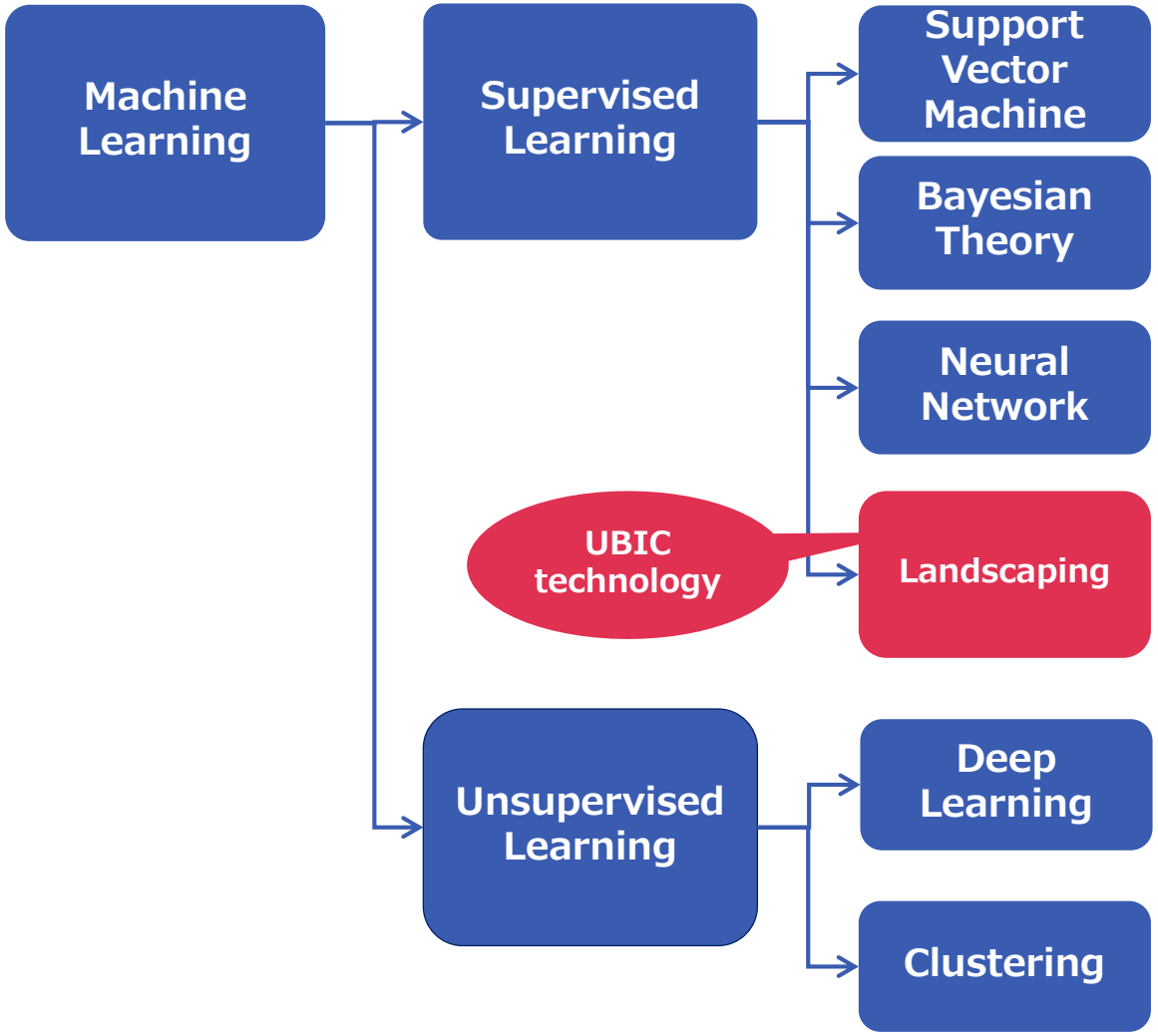
Need to prepare huge amount of training data & large infrastructure



Output

Even though users have to sort out vast amount of data for their first time, they can easily do this with our AI, for it requires only a small amount of input data to develop intelligence, and installation cost is lower than conventional ones.

What is Landscaping?



Users will be anticipating to find the 'right' keyword in order to conduct a successful keyword search. Also, the scoring parameters for computing the scores cannot be specified precisely. Since the use of keyword weighting system in this method is limited to each case, it offers no functional (content) expansion.

Due to the fact that this method requires the system to calculate all factors which could possibly be a target, the overall running cost is expensive.

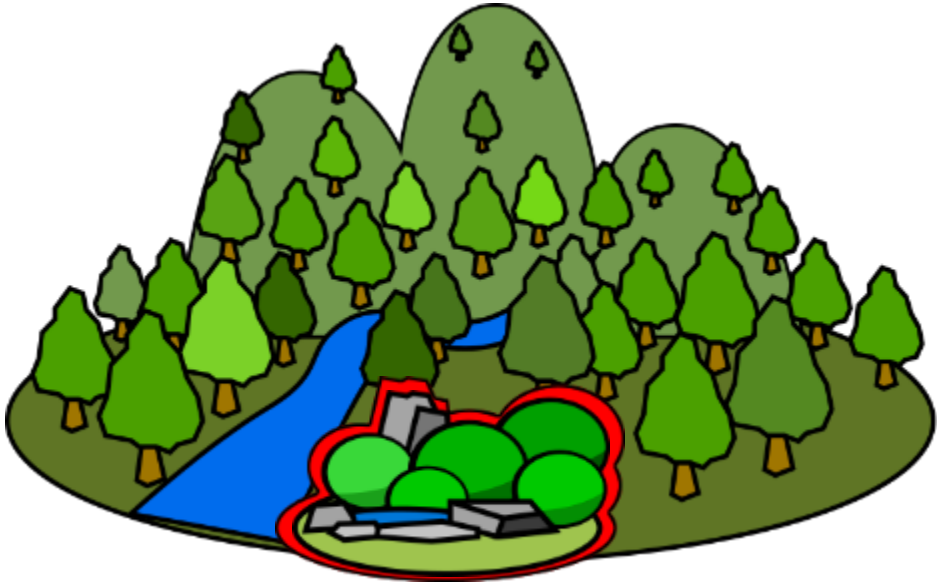
Since the search result by this method is strongly influenced by the training data features, it could possibly miss a target if source data has a slightly different aspect.

Can extract information from a vast amount of data based on prediction resulting from a small input-data.

This is like a spin-off of a Neural Network method. Although, it also has been modified many times, the basic feature of depending heavily on the training data still remains as a downside.

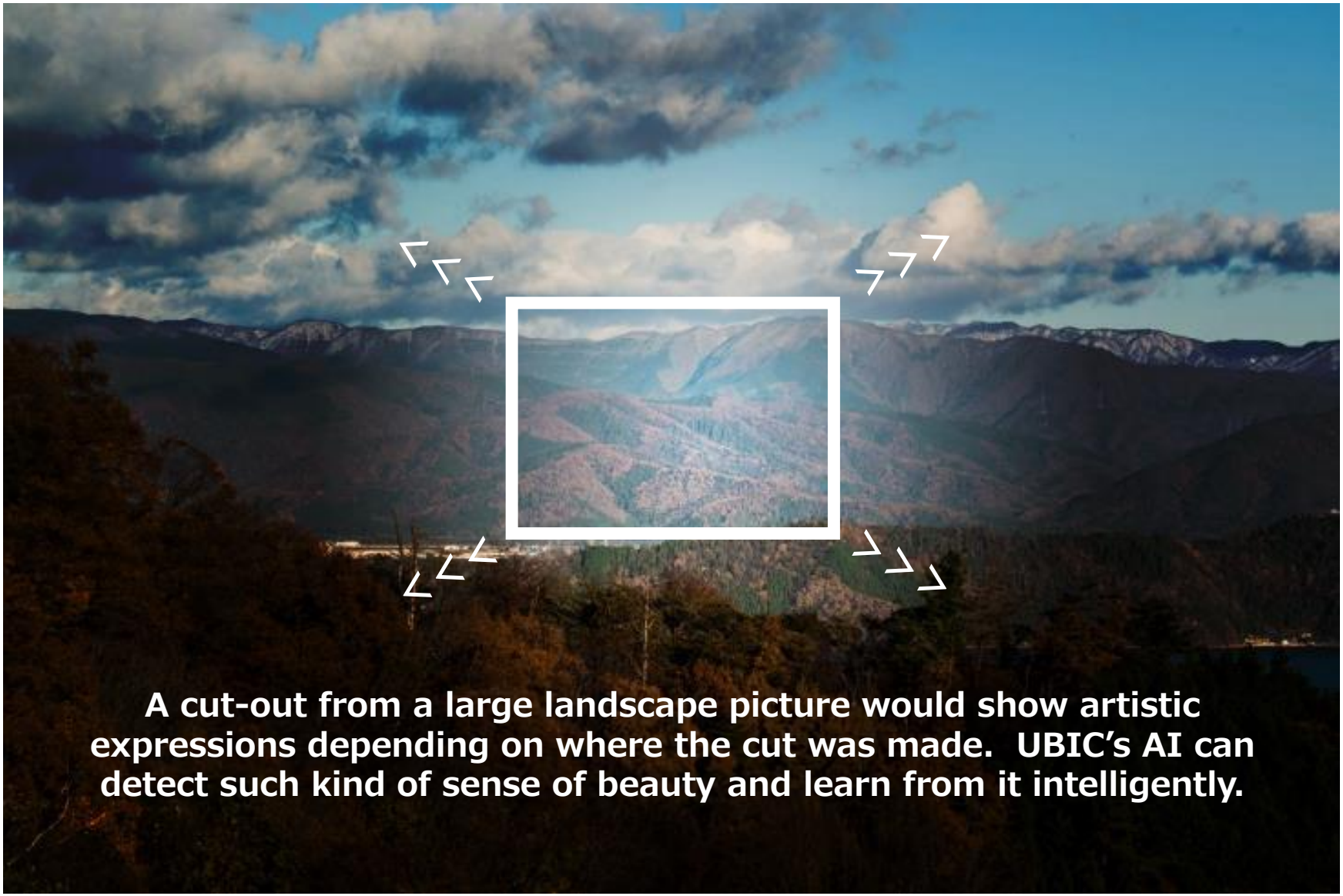
Classify data automatically without having any influences of external factors.

Landscaping



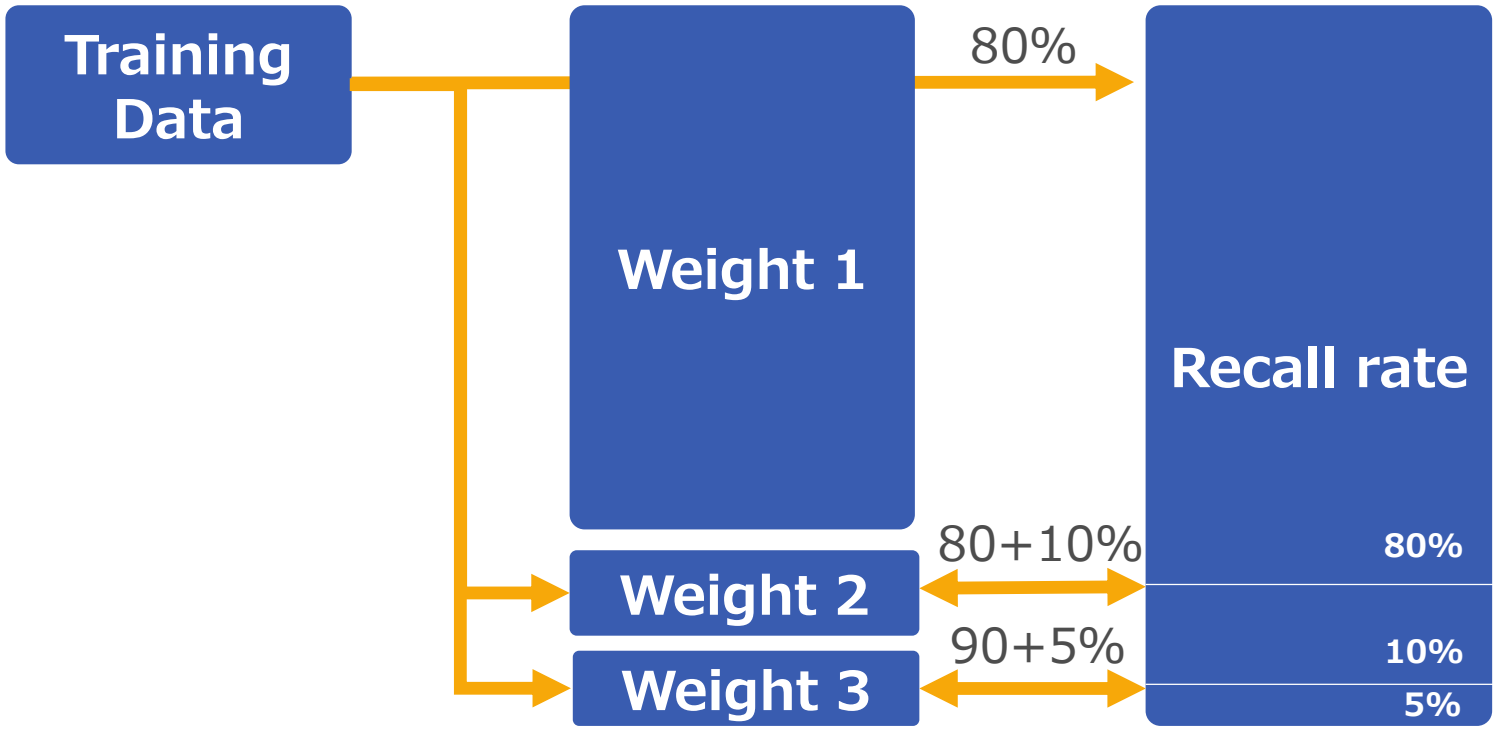
Just like how the terrain under your feet at a Japanese garden blends with the entire landscape, the training data's vision and perspective can reflect the universe of big data.

Landscaping



What is landscaping? - Weight Refinement

The system can automatically optimize search by selecting necessary keywords and weighting them adequately.



Data's recall rate ≒ a mechanism that works to maintain precision while automatically aiming toward a more comprehensive search.

What is landscaping? - Mutual Information

Mutual Information is a basic information that appropriately expresses the connection between “important documents” and “existence of keyword in the document”.

An Example of Naive Bayes vs. Mutual Information

- **Naive Bayes:**
  The probability of important documents given that a specific keyword exists in them.
  ⇒**Only a portion is taken into account.**

- **Mutual Information:**
  This takes into account both factors which are “existing keyword in a document” and “important document.”
  ⇒**More complete and comprehensive.**

	Keyword exists	Keyword does not exist
It is an important document	**True Positive**	**False Negative**
It is an unimportant document	**False Positive**	**True Negative**

Even if the input data is small, AI can enhance the adequacy of its judgment by this wide search zone.

Grant Programs of Japan Agency for Medical Research and Development (AMED)

Japan Agency for Medical Research and Development

is an independent administrative institution under the jurisdiction of the Cabinet Office. With an aim to accelerate the operational flow from basic research to practical application, AMED engages in medical R&D and establishment/maintenance of medical research environment which takes place at universities and research institutions nationwide.

Budget as of FY2015: JPY 124,800,000,000

UBIC MEDICAL chosen to take part in project commissioned by AMED

In this project, we will be cooperating with leading partners in the medical field: Keio University. We aim to develop a medical device that can assess the mental symptoms objectively in real time.

媒体名	日経産業新聞
掲載日	2015. 8. 26

精神疾患症状評価システム

UBICメディカルなど6社

発言・表情集め解析

● **institution to cooperate**

Keio Gijuku

Advanced Media, Inc.

UBIC MEDICAL, Inc.

System Friend K. K.

SemcoTechno K. K.

SoftBankCorporation

Japan Microsoft Co., Ltd.

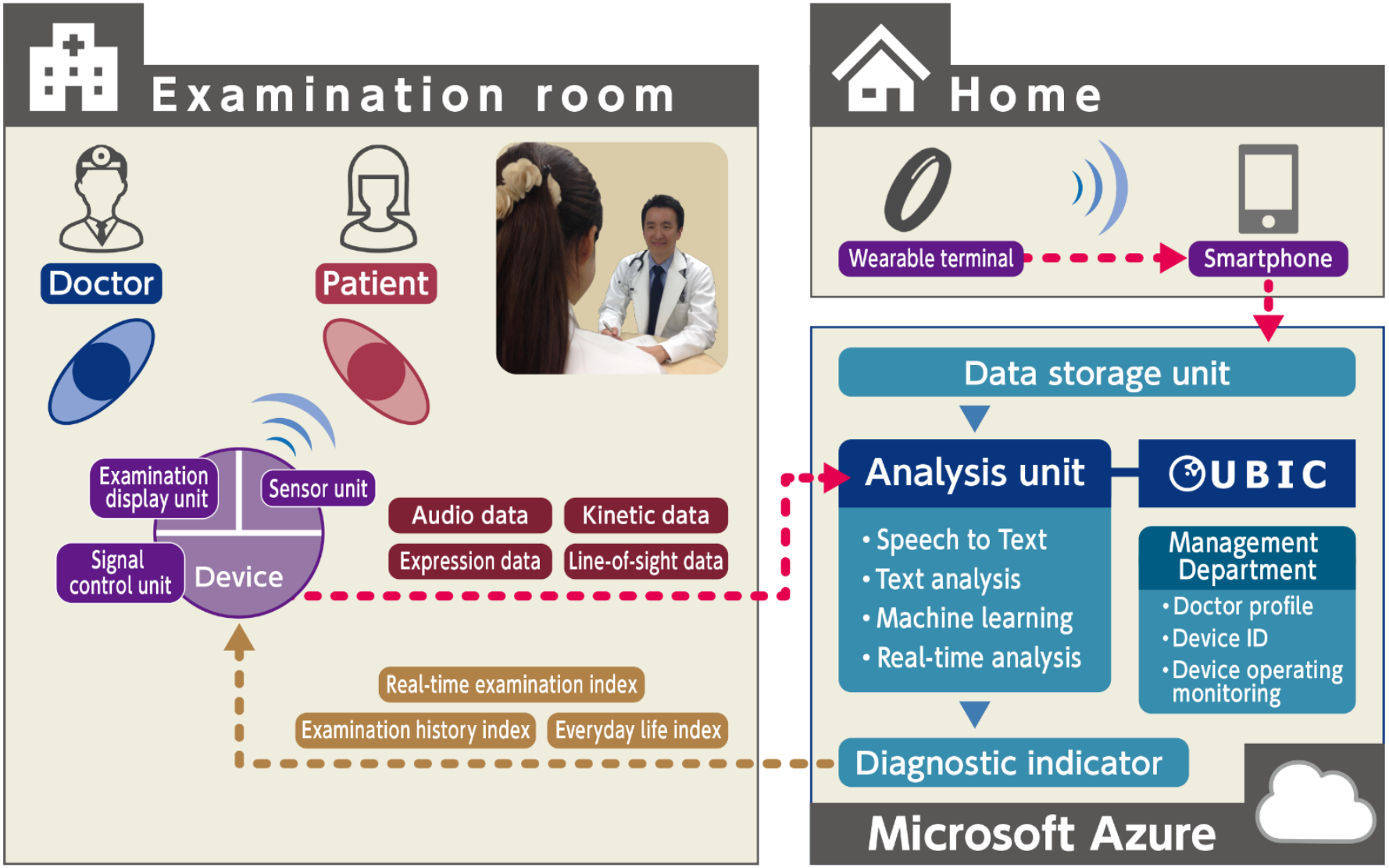
About Keio University:

Founded in 1920 as the first Japanese private university. Formerly known as School of Western Studies from 1858. Established the Medical school in 1873, and added official university medical departments in 1917. The Keio University Hospital was founded in 1920. As one of the leading medical educational institutions of the nation, Keio University has been producing many qualified doctors to the world. Statistics as of May 1, 2015: 28,855 students and 10 departments.

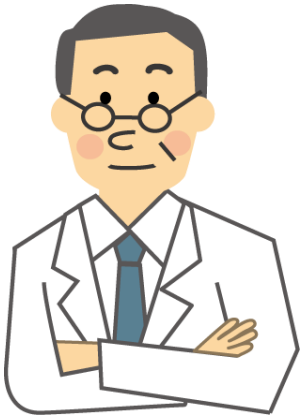
PROMPT

Project for Objective Measures using computational Psychiatry Technology

Project outline



A visit to a psychiatrist



Diagnosis & assessing severity of mental symptoms

List of Mental Ailments

- Depression
- Manic-depression
- Dementia
- Schizophrenia
- Anxiety disorder
- Developmental disorder
- Etc.

Today, psychiatrists generally interview and listen to their patients. However; many psychiatric critics argue that such method poses many problems.

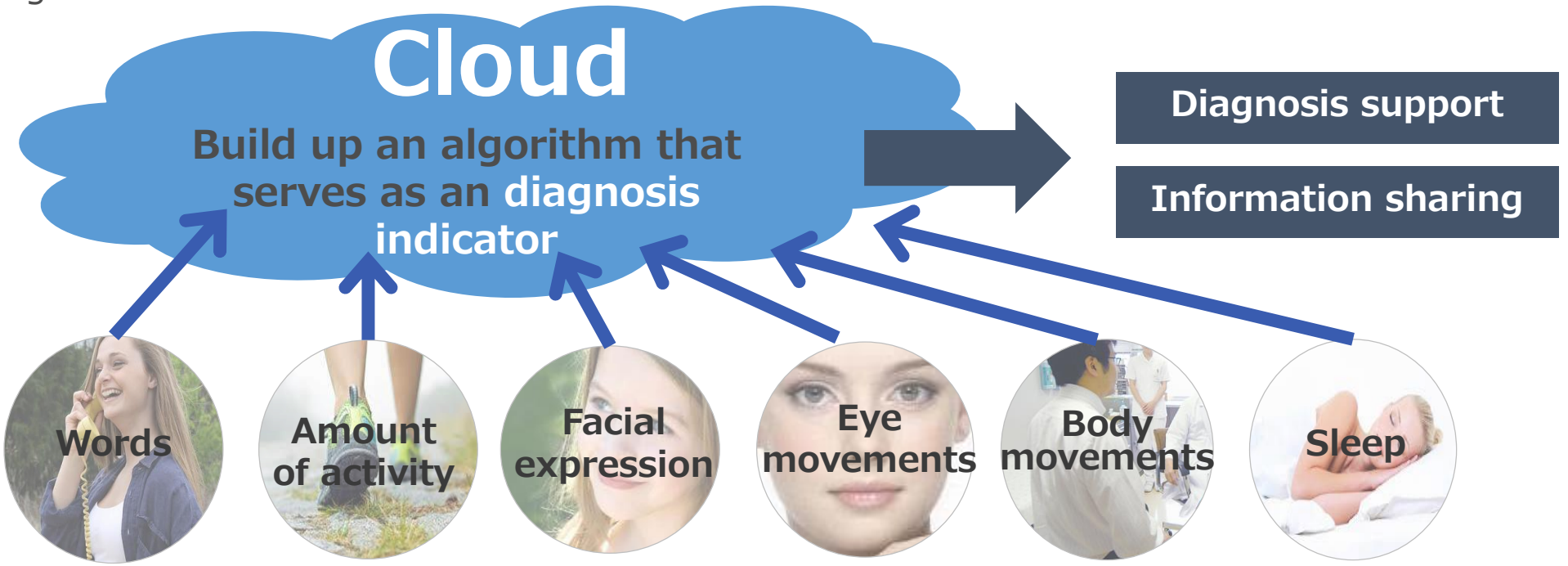
- Usually, the psychiatrist's subjectively-based assessment would determine the severity of the illness.
- The assessments can vary greatly among doctors.
- Diagnostic delay in mental ailments; the acceptable time to start a treatment is yet ambiguous; configuration of a treatment are based on the doctor’s experience and feelings; etc.
- No clear measurements to allow doctors to assess the outcome or impact of drug effect.

Psychiatric diagnosis are primarily based on the doctor’s personal skills. Unlike other medical treatments, it is difficult to give an “objective” assessment.

Conversation analysis with AI

With our proven track record of analyzing electronic medical records, and ESI for eDiscovery, UBIC MEDICAL launches on a project focusing on analyzing data (text data) that had been extracted from patient's spoken dialogue, so as to estimate the severity of the mental illness "objectively".

After bringing together all of the findings from each company, we will apply the latest technology to the project to quantify—the patient's everyday life, conversation, verbal sounds, facial expression—to enhance the level of objectivity. We will then develop an indicator which serves to show severity of mental illness, by executing machine learning by using multi modal data.



Lit i View

PATENT EXPLORER

an AI-based Intellectual Property Strategy Support System

The issues managers of IP department encounters

Having a problem?

In order to protect the company's original technology, we need assistance from an expert who has advanced skills in order to carry out a patent survey.

Need advanced and professional skills

Since the scope of technological information involved in a patent survey is wide, we will have to look through a broader range of data.

Massive amount of data

We outsource our document review because the task is complex. However, it is costly and is taking a lot of time.

Increase in time and cost

Resolving the issue

Issues of IP Manager

- Immense data
- Require advanced knowledge and expert skills
- Increase in time and cost

Solve issues by using AI technology !

Lit i View
PATENT EXPLORER

- Prioritize massive amount of data to boost operational efficiency.
- Can analyze data based on exceptional tacit knowledge, instead of depending on skill of an individual.
- A new approach to enhance the precision level and review speed.

PATENT EXPLORER Features

AI-based technology

The PATENT EXPLORER is equipped with UBIC's original AI that have been upgraded by meeting the actual demands of speed and precision required in a litigation or fraud investigation.

Can dramatically improve productivity rate of a document review.

Can boost efficiency on your patent survey because PATENT EXPLORER can go through a learning process where it acquires tacit knowledge and gains the ability to make judgements like an expert.

High Precision

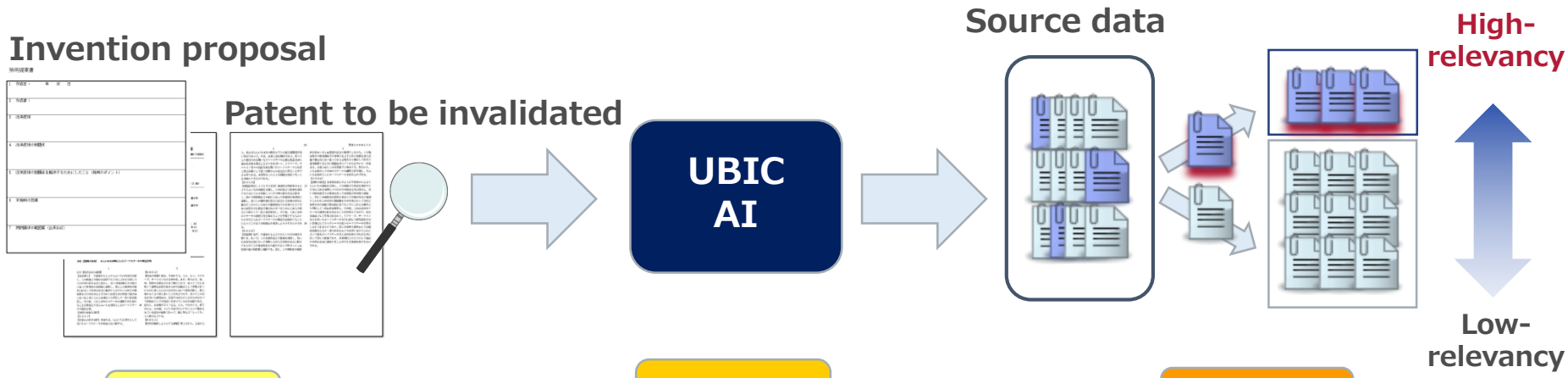
Our development goes a step further from the conventional search: keyword search, similarity search, and conceptual search. Our software can obtain higher precision by feeding on user's feedbacks during its iterative re-learning process.

Prospects of expanding into various areas.

Whether it is a prior-art search or an invalidity search, the PATENT EXPLORER will extract the data which you need with more efficiency.

PATENT EXPLORER: the data analysis workflow

You can gather some target data and let the PATENT EXPLORER learn from them. It will then gain the ability to classify documents automatically, and at the end show you paragraphs that it found to be highly relevant to your target. In addition, it can go through an iterative re-learning process to improve its precision level.



Easy 3 Steps

1

Feed the PATENT EXPLORER with the kind of documents you want to find the most (i.e. proposal of invention, patent to be invalidated) UBIC's original AI can learn from a small amount of training data.

2

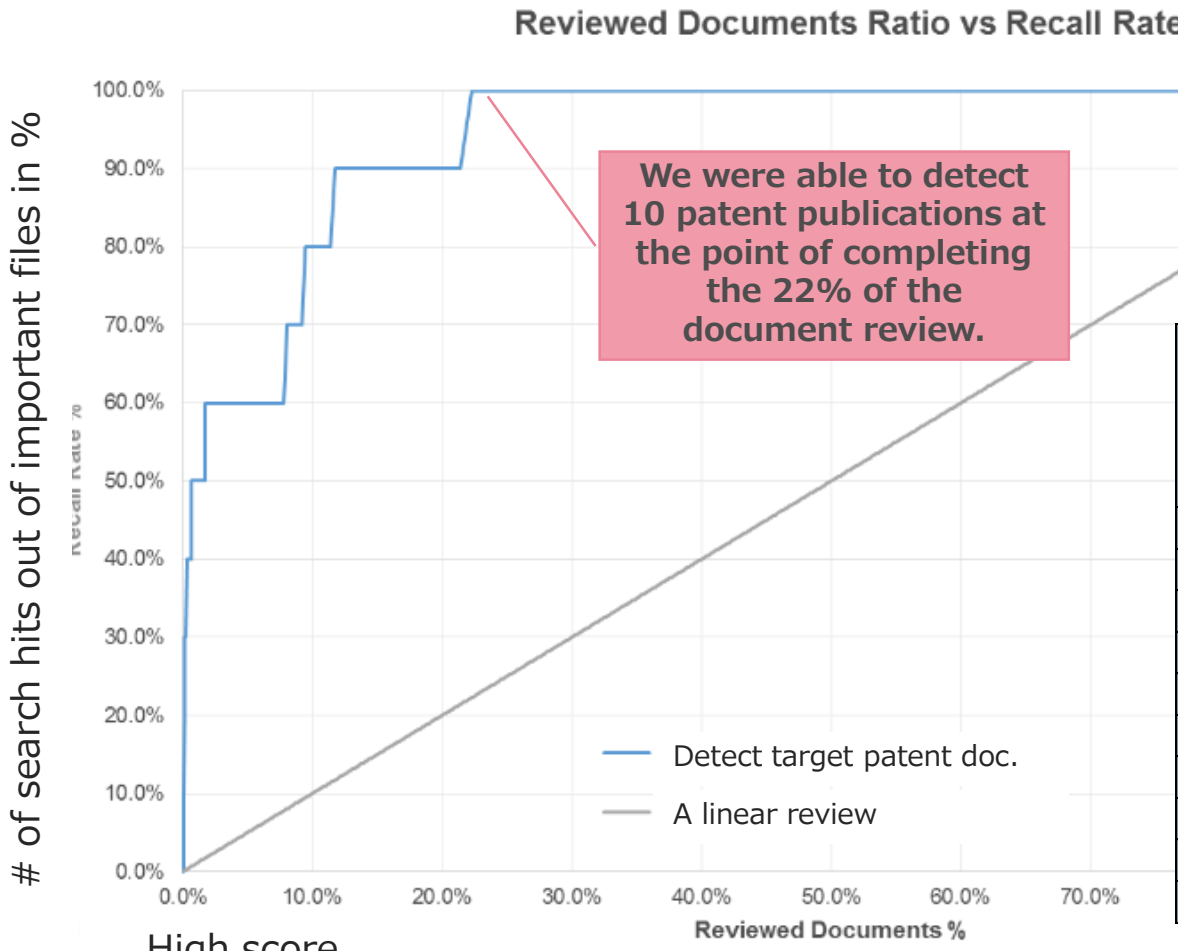
The document you fed is called training data. The PATENT EXPLORER actually teaches itself how to classify data by using the training data. After the learning process, it will begin to assign scores to all files that need to be analyzed.

3

The PATENT EXPLORER classifies data according to the scores and this will make your patent survey workflow much easier.

Verify efficiency of case study A

According to the case study, the AI was able to detect 10 out of 3,132 cases of patent documents. (Only Y patent document was set as the search source, but the document search can also be accomplished by using a mix of Y and X patent documents as the search source.)



Efficiency of the review improved by 4.5 – 187.9 times.

Date of release	Rankings based on AI's assessment	Document volume that completed review	Efficiency
1st Doc	3	0.1%	104.4
2nd Doc	4	0.1%	156.6
3rd Doc	5	0.2%	187.9
4th Doc	9	0.3%	139.2
5th Doc	21	0.7%	74.6
6th Doc	54	1.7%	34.8
7th Doc	251	8.0%	8.7
8th Doc	292	9.3%	8.6
9th Doc	367	11.7%	7.7
10th Doc	690	22.0%	4.5

High score

Low score

Review completion in % (reviewing in order from highly prioritized paragraphs)

Patent Information Fair and Conference

Name: 2015 Patent Information and Fair Conference
http://www.pifc.jp/

Date: November 4-6, 2015 Wed-Fri (3 days)

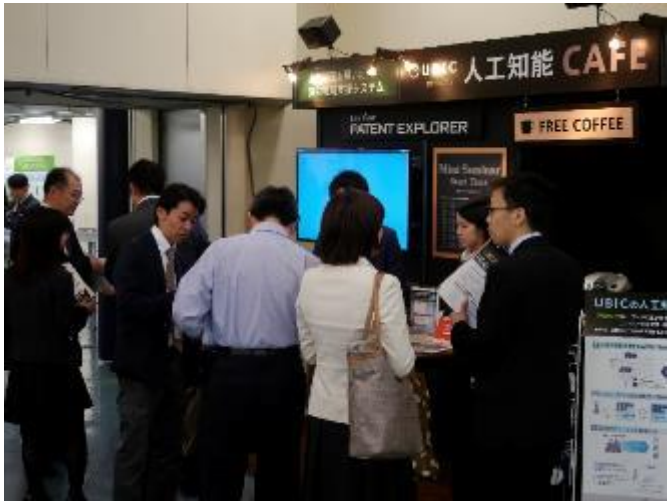
Time: 10:00 - 17:00

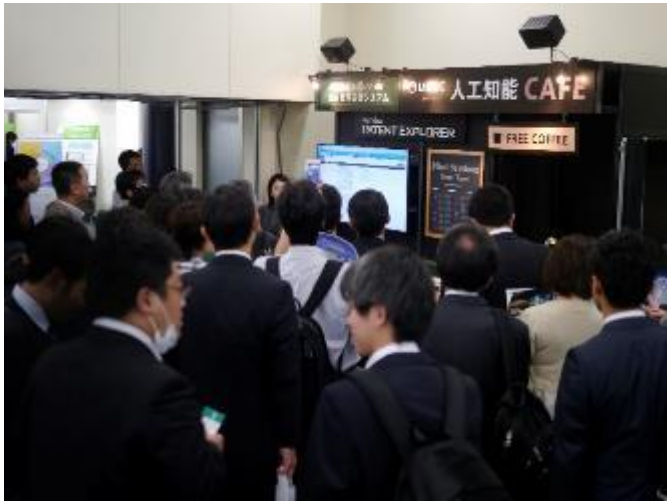
Venue: Science Museum (Kitanomaru Park, Tokyo)

Organizers: Japan Institute for Promoting Invention and Innovation,
Japan Patent Information Organization,
Fuji Sankei Business i, Sankei Shimbun Co., Ltd.

Patent Information Fair and Conference: UBIC Exhibition Booth

A mini-seminar was held every 30 minutes at our booth to introduce Lit i View PATENT EXPLORER. According to the Nikkei Newspaper dated October 29th, many people traveled a distance to visit the booths, and the aisles were crowded with people.





Patent Information Fair and Conference: Business presentation

On November 6th, Takeda Hideki, CTO of UBIC spoke about “UBIC’s latest case studies which reveals how the data analysis utilizing AI made the patent survey easier.” Guest speaker and joint partner, Yousuke Morita of Toyota Technical Development, joined to share about the results brought forth by PATENT EXPLORER via verification experiments during the development phase and also talked about what kind of effects we can anticipate. With arrival of 170 guests, the 90 seats of the conference room were soon filled. The organizers took account of this and changed the location to a wider hall.

This presentation was prepared by:

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Minato-ku, Tokyo 108-0075, Japan

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Safe Harbor Statement

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