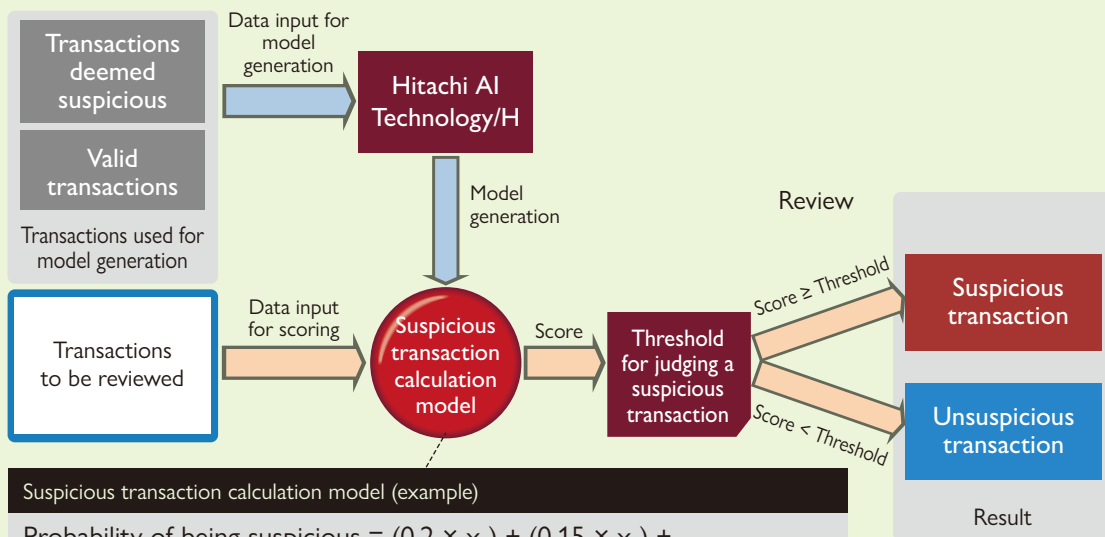# Financial Systems

## 1 Applying AI to Identifying Suspicious Transactions in Securities Firms and Exchanges

The securities industry is making growing use of artificial intelligence (AI) for tasks such as the automated trading of stocks and bonds, decisions about opening accounts, or giving credit for loans.

As part of this trend, Hitachi AI Technology/H (Hereafter referred to as AT/H) is being deployed in the reviewing of stock trades, a job that in the past required a specialist, where it is being used in place of such specialists to screen trades for possible suspicious activity. Past trading data, the results of reviewing trades, and market data, all of which were pre-processed based on the knowledge of the specialists and were supplied to AT/H to generate a model that quantifies risk assessments that are close to what the specialists had done. The aim is to improve efficiency by feeding transaction data into this model so that it can produce risk assessments similar to those determined by the specialists and reduce the number of trades that ultimately need to be checked by a person(specialist). As of September 2018, this solution had been adopted by a number of companies.

Along with enhancing the AT/H model by expanding its scope of application to cover a larger number of types of suspicious transactions, future plans also include expanding its scope of application to cover other financial products than stocks as well as all other types of commercial transaction activity.



- Generate a model using a set of transaction data for the purpose of determining if a transaction is suspicious with specific activity
- Calculate a score for the transactions to be reviewed to indicate whether or not they are suspicious

**Suspicious transaction calculation model (example)**

Probability of being suspicious = $(0.2 \times x_1) + (0.15 \times x_2) + \ldots$

$x_1$: Customer is between 20 and 30 years of age and does 100 or more trades per day
$x_2$: Customer trades 10 or more stocks per day and spends less than 1,000 yen per trade

**1** Flowchart of using AT/H to check suspicious activity

## 2 | Interactive Digital Services for Financial Institutions

The changing social environment over recent years has made it necessary for financial institutions to take steps to achieve efficiency gains, cost reductions, and service improvements. Hitachi launched a chatbot service in July 2018 and a transcription service in October 2018, both of which represent interactive digital service solutions for efficiency improvement and the enhancement of service quality through a combination of speech and natural language processing. A service for financial institutions that incorporates these will also be launched in late 2018.

The interactive digital service for financial institutions not only offers a wider range of services for such customers that utilize its speech and natural language processing platform, the services will also be further expanded in the future through enhancements in performance achieved by adding to the dictionary and database of scenarios suitable for the finance industry.

The transcription support service offers greater flexibility in the sort of meetings it is able to handle, including by discriminating between different speakers speaking at the same time and by achieving better recognition accuracy for voices at a distance from the microphone. The chatbot, meanwhile, includes functions that improve how it responds to variations in user speech (use of different word endings, synonyms, differences in phrase order, and so on), making it suitable for rapid deployment because less work is required by the operator.



API: application programming interface   RPA: robotic process automation
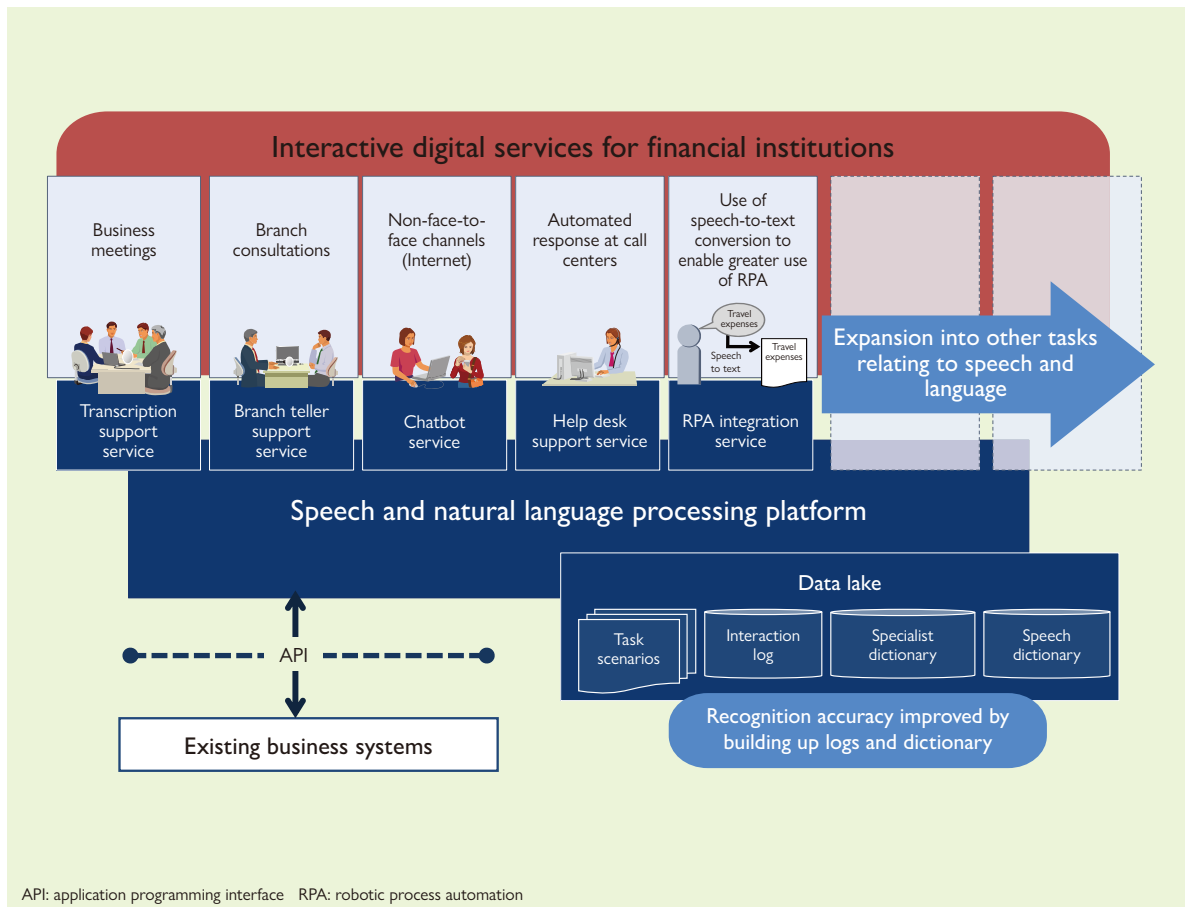
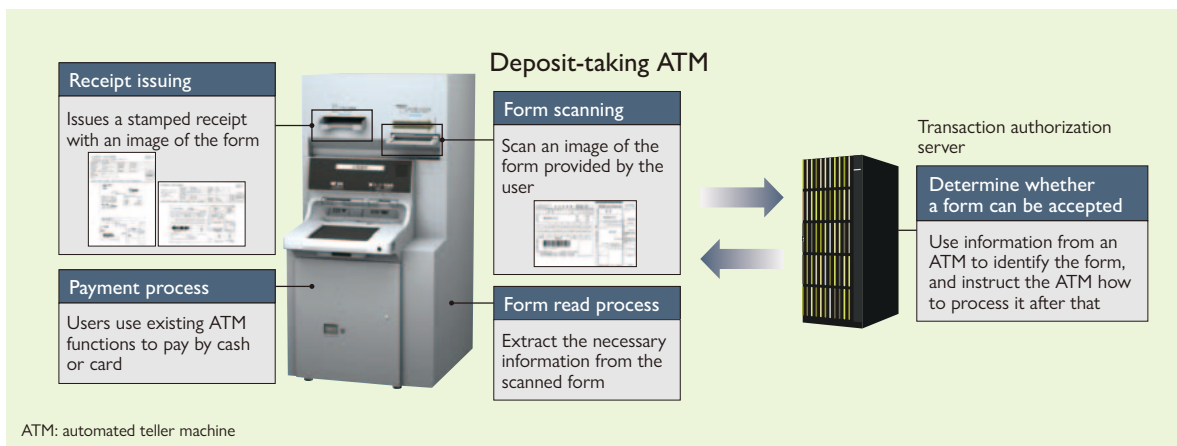**2** Interactive digital services for financial institutions

## 3 Deposit Slips-adapted ATM Using Recognition Technology that Works Against Undefined Forms

A deposit slips-adapted automated teller machine (ATM) enables the processing of various different types of deposit slips, such as those for tax payments, by using a recognition technology that works against undefined forms. This means it is able to handle tens of thousands of different tax payment types and other deposit slips, which could only be dealt with by a teller.

With this ATM, users now can process their own payment transactions, which can reduce congestion at the teller counter, and users no longer need to fill out payment request forms, which results in bringing greater convenience and better service to users while helping tellers make work more efficient. A key feature is the use of a form recognition technology, which Hitachi developed, to identify and acquire necessary information from an image of the form captured by a scanner. Due to this technology, it is able to acquire the necessary information from forms without having to either predefine regions to scan or specify their formats in advance, so the ATM is able to process a much wider range of payment slips than in the past.

Hitachi will continue to respond flexibly to the increasing and diverse requirements of financial institutions to support their objectives, including service quality improvement and efficiency gains.



**Deposit-taking ATM**

**Receipt issuing**
Issues a stamped receipt with an image of the form

**Form scanning**
Scan an image of the form provided by the user

**Payment process**
Users use existing ATM functions to pay by cash or card

**Form read process**
Extract the necessary information from the scanned form

Transaction authorization server

**Determine whether a form can be accepted**
Use information from an ATM to identify the form, and instruct the ATM how to process it after that

ATM: automated teller machine

**3** System diagram