Utilization of NTT's R&D Technology in the Financial Industry

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Abstract

The financial industry is currently going through major transformations owing to a technological innovation called *fintech* (i.e., finance and technology). The NTT laboratories have been researching and developing a number of technologies that contribute to the promotion of fintech such as concealment technology for blockchain, artificial intelligence technology for automated responses to customers, and robotic process automation technology for improved operational efficiency, and we have been able to introduce these technologies via various NTT Group companies. This article introduces some collaborations with Mitsubishi UFJ Financial Group, Inc., in cooperation with NTT Communications, that we have been implementing since fiscal year 2017. The future utilization of NTT technology in the field of fintech is also discussed.

Keywords: fintech, digitization, teleconference

1. Background

In the financial industry, the development of digital financial technology called *fintech* has been greatly transforming financial operations. Technological innovations are being made across a wide range of applications; some examples are credit screening by artificial intelligence (AI), automated responses to customer inquiries by chatbot, and international remittances with cryptocurrency using a new information infrastructure technology called blockchain.

NTT and Mitsubishi UFJ Financial Group, Inc. (MUFG) have been jointly studying digitization transformation for about a year, in cooperation with NTT Communications. By introducing various technologies developed by the NTT laboratories and jointly investigating the possibility of utilizing those technologies in the banking business, we are aiming at mutually accumulating knowledge for creating business by utilizing our research results in the future.

The technological innovation achieved through NTT's research and development (R&D) that attract-ed the interest of MUFG is our immersive telepresence technology called Kirari!. Kirari! comprises an array of technologies that transmit high-reality images in a manner that makes viewers feel like they were seeing the objects of the images in person even when the objects are in remote locations. We have been developing Kirari! with the aim of applying it to relay broadcasts of entertainment such as sports, *kabuki* plays (traditional Japanese performing art), and concerts. When we introduced this technology to MUFG, we received proposals to apply it for handling situations such as external events, conferences, and customer visits to branches. We subsequently began a joint study in a wide range of areas on the possibility of utilizing the technologies of the NTT laboratories in order to provide new banking services at MUFG.

Currently, to improve management efficiency, megabanks and other banking institutions are aiming to increase the number of next-generation branches at which customers handle various procedures themselves and to offer new banking services by which various procedures are completed in customers'
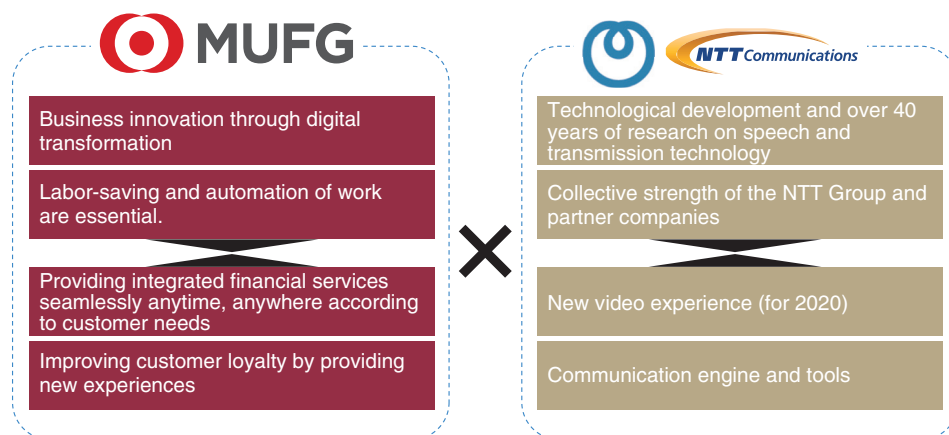
Fig. 1.   Joint study on realizing a future vision of banking services.

homes. Using ordinary video calls to customers who visit branches is one approach; however, communication via ordinary video calls might be perceived as cold and unwelcoming by customers. MUFG thought that applying NTT's advanced technologies such as Kirari! and corevo® AI technology would make it possible to respond to customers from a remote location while maintaining warmth and a sense of connection with people.

2.   Collaboration with MUFG

In fiscal 2017, we held a workshop-style discussion to explore a joint study on the theme of realizing the future vision of banking services. About 20 members from MUFG participated in regular meetings, mainly from the Digital Transformation Division, who are promoting digital transformation of the banking business. The scale of the joint study became very large as various studies were initiated and discussed in eight meetings in total.

In these studies, we exchanged views on introducing NTT's technology and the possibility of utilizing it with two major points of focus, namely, a new video experience, and a communication engine and tools.

To illustrate the first point, a new video experience, we held a joint exhibition using a television-size viewing box on how to use Kirari! with customers when they visit branches. This conceptual exhibition provided exhibition visitors with a hands-on experience in which a virtual agent (a character mascot representing MUFG) was projected in a pseudo-three-dimensional manner by Kirari! technology to

deal with customers. This exhibition received a favorable reception at the Singapore FinTech Festival 2017 and CEATEC JAPAN 2017.

For the second point, a communication engine and tools, we introduced our research accomplishments in speech technology cultivated by NTT over many years, for example, speech recognition, speech synthesis, and intelligent microphones, and discussed how to utilize these technologies in the banking business. For example, we hypothesized that linking the intelligent microphone and speech recognition with speech-to-text technology would enable voice data recorded while dealing with visiting customers to be converted to text, which could then be accumulated and analyzed. Sharing good responses to customer inquiries as examples among branches would make it possible to improve customer satisfaction and work efficiency.

We also introduced our annotation technology, which displays operational explanations and messages regarding issues needing attention on the system screen without affecting the existing system. Accordingly, we were able to obtain opinions on specific usage scenarios stating that the technology can be utilized as a system to support operations by elderly people and foreign customers as banking procedures continue to advance toward being paperless and are handled by customers themselves.

From this point on, we will continue to strengthen our relationship through a series of joint-study sessions in order to promote digital transformation in the financial industry (**Fig. 1**).
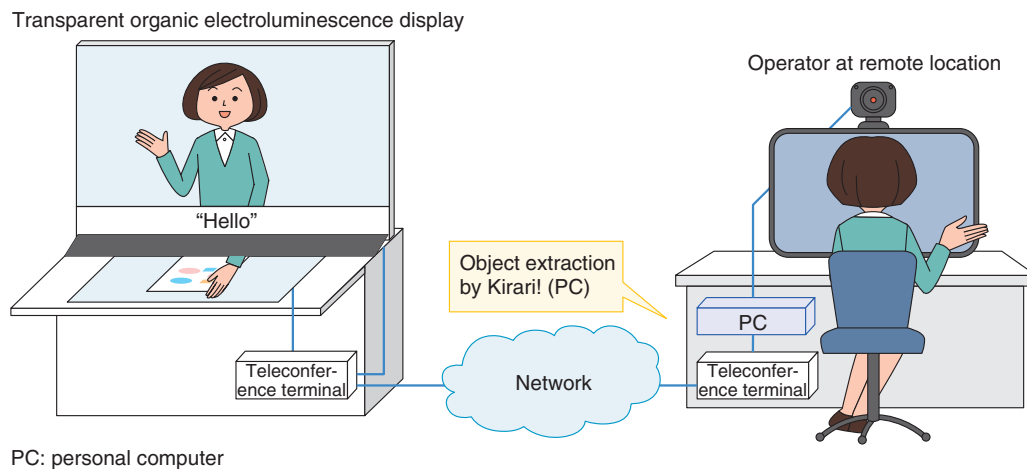
Fig. 2.   Prototype of customer reception system.

3.   Utilization of latest technologies

NTT and NTT Communications are making full use of the knowledge gained through these studies to commercialize products and services.

3.1   Speech recognition

The joint study enabled us to recognize the possibility of utilizing the speech-recognition and Japanese-language-analysis technology of the NTT laboratories in MUFG operations. As a result, the application of this technology is being considered for call centers as well as in other scenarios such as at storefronts, for outside visits, and for recording the minutes of meetings at banks to improve work efficiency by combining technologies that can *visualize* the customer's voice by speech recognition and can carry out thorough searches by using robust media search technology. As the first step of one study, MUFG's outbound call center is utilizing ForeSight Voice Mining to evaluate the possibility of applying it for purposes such as emotion analysis and summarization.

3.2   COTOHA Translator™

Automatic-translation technology based on COTOHA Translator™ is proving advantageous with the globalization of the banking industry. It is increasing the number of opportunities to translate materials and serve customers in multiple languages in scenarios such as dealing with inbound visitors to banks. COTOHA Translator achieves high translation accuracy without changing the slide layout of Microsoft PowerPoint documents; consequently, it is gaining

popularity as it leads to significant improvement in work efficiency, and we are presently evaluating it at MUFG. To diversely utilize these corevo AI technologies of language recognition and analysis processing in the financial business, we will promote joint studies aimed at providing new banking services by leveraging NTT's comprehensive technical capabilities such as the fusion of corevo and Kirari!.

3.3   Kirari!

At the NTT Communications Forum 2018 held in October 2018, a terminal capable of displaying glassless three-dimensional images was exhibited. This terminal uses Kirari! technology and an aerial-imaging plate provided by NTT Communications in cooperation with Dai Nippon Printing Co., Ltd. We are working to offer the terminal at a reasonable cost and in a size used at financial institutions and other branches, and are planning to commercialize the terminal in the future.

In addition, the NTT laboratories exhibited a prototype of a customer reception system at the NTT R&D Forum 2018 Autumn (**Fig. 2**). This system connects the object extraction technology used in Kirari! with a general-purpose teleconference system and uses a transparent organic electroluminescence display. It can provide a realistic sensation by Kirari! in a general broadband environment such as that provided by a FLET'S Internet access service. We want to make the system available to a wide range of industries—starting with the banking industry—that must deal with customers in remote locations.

4. Future directions

The NTT laboratories are researching and developing cutting-edge technologies such as blockchain and quantum computers that are expected to be used in the fintech field. We will continue to strive to derive the best practices through collaboration with MUFG and other financial institutions.

Cooperation with NTT Group and future expectations

At MUFG, digitization is one of the pillars of the structural reform outlined in our medium-term business plan, and the Digital Transformation Division is playing a role in developing and promoting wide-ranging initiatives for improving top-line results and streamlining processes. In regard to those initiatives, NTT Communications has introduced new technologies of the NTT Group in cooperation with NTT researchers through workshops, tours of the Musashino and Yokosuka R&D Centers, NTT Communications Forums, etc., and we have received many ideas on new things we can do.

We are currently working with NTT Communications on converting voice data into text at outbound call centers. I expect to see more proposals that will lead to a reduction in workloads by making full use of the NTT Group's advanced speech and transmission technologies.

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He joined NTT in 1995. He moved to NTT Communications in 1998 and worked on system integration of corporate systems. He rejoined NTT in 2014 and engaged in research and business development of digital watermarking, information and communications technology for the home, and big data. He has been researching and developing Kirari! immersive telepresence technology since 2015.

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He received a B.S. in physics from Ehime University in 1995. He joined NTT in 1995 and worked in the corporate sales and service creation department of NTT WEST. Since 2017, he has been responsible for research and service creation in the area of financial technology.