

# Promotion of Co-innovation through Collaboration with Different Business Sectors

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### Abstract

NTT aims to create new services by working with different business sectors as value partners, while shifting its business model from B2C (business-to-consumer) to B2B2X (business-to-business-to-consumer, government, or company). NTT Service Evolution Laboratories is also promoting co-innovation with partners in different business sectors. In this article, we describe some examples of the latest efforts to implement co-innovation activities of the NTT Group.

*Keywords: co-innovation, collaboration, value creation*

### 1. Introduction

With the objective of revitalizing the information and communication technology (ICT) market through new-value creation, NTT EAST and NTT WEST have shifted their business models to a Hikari Collaboration Model, under which their business partners are allowed to re-sell NTT's optical access services. To accelerate this switch in business model from the conventional B2C (business-to-consumer) to B2B2X (business-to-business-to-consumer, government, or company), the NTT Group is involved in ongoing co-innovation activities with partners from a variety of different business sectors.

For example, in collaboration with four major companies, NTT WEST began efforts [1] in April 2015 to further accelerate co-innovation aimed at creating new business through facilitating cooperation between large and established businesses and startups. In July 2016, in collaboration with McLaren Racing Limited and Honda Motor Co., Ltd., NTT Communications initiated efforts [2] to establish an optimum ICT platform to support Formula 1 racing teams.

Over the last three or four years, NTT has maintained business alliances with Dwango Co., Ltd. [3] and Mitsubishi Heavy Industries, Ltd. [4] and is con-

tinuing efforts aimed at creating new value by utilizing research results in the ICT field. The co-innovation effort with Dwango is targeted at upgrading video and social networking services, so we have been jointly developing interactive streaming technology for omnidirectional video, which can deliver immersive video even when bandwidth is limited. This technology was implemented as a virtual-reality live streaming service [5].

The co-innovation project with Mitsubishi Heavy Industries involves the commercialization of a high-noise-reduction head-set type intelligent microphone, which can collect sound clearly even in noisy environments (i.e., at a noise level close to 100 dB) such as factories and building sites, through our combined research and development (R&D) efforts [6].

In addition, we are involved in several other co-innovation activities. For example, in collaboration with Daiichi Kosho Co., Ltd., we are carrying out joint investigations using NTT's speech processing technology [7]. We believe that the significant results of implementing the above-described co-innovation activities by utilizing NTT's own technologies will help to solve problems in society and create value through new markets.

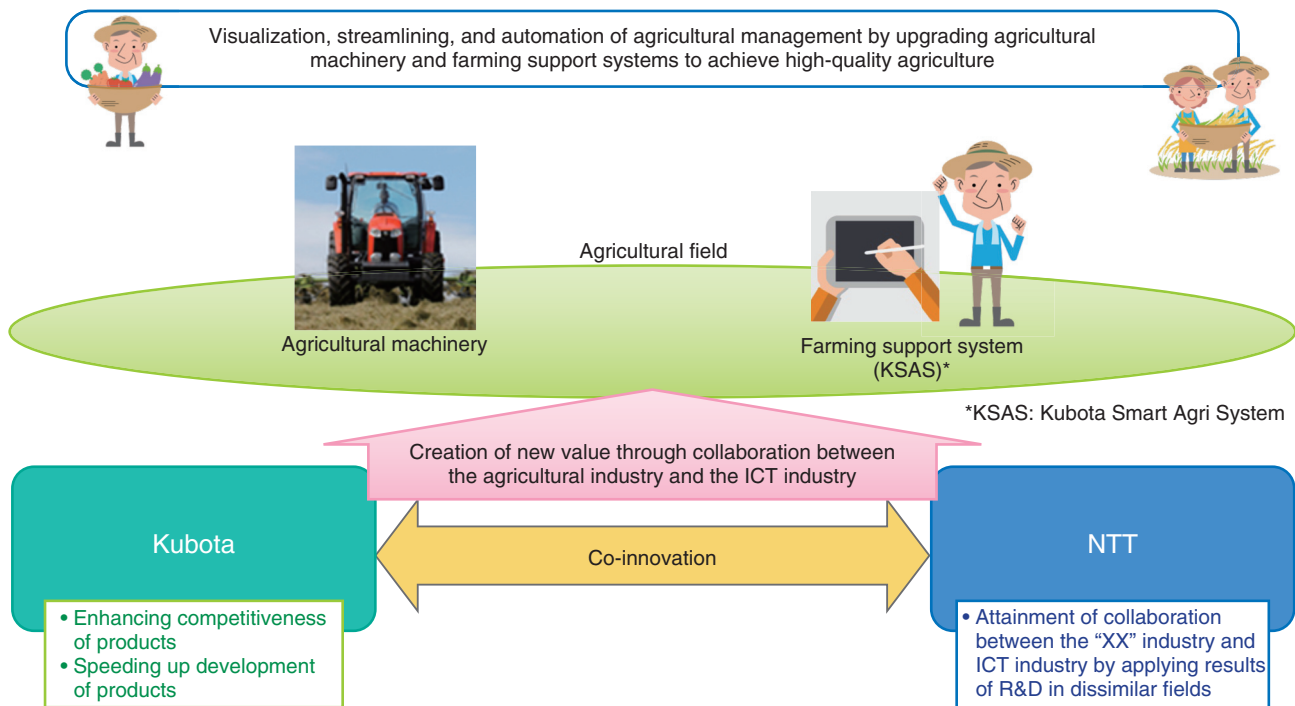


Fig. 1. Agricultural-centered co-innovation with Kubota Corporation.

## 2. Solutions to social problems and creation of value in new markets

The NTT Group aims to support sustainable development in society and is therefore working on solving various social problems. However, many social problems—such as Japan’s decreasing birthrate and aging population as well as sluggish employment generation—can neither be solved single-handedly nor by ICT alone. Nevertheless, we can expect to open up completely new markets by applying ICT. Under these circumstances, we aim to solve social problems and create value in new markets by utilizing NTT technology. We describe in this section some of our ongoing efforts.

### 2.1 Agricultural-centered co-innovation with Kubota Corporation

The field of agriculture is facing serious problems. For example, Japan’s farmers are aging and dwindling in number since fewer people are entering the field. In June 2016, NTT signed a comprehensive partnership agreement with Kubota Corporation, a major agricultural machinery manufacturer [8]. By focusing on the agricultural-solutions field, which Kubota is trying to expand, and combining ICT ser-

vices provided by various NTT Group companies, we are coming up with ground-breaking innovations that tackle problems such as rejuvenation of farming communities (focusing on the lack of replacement farm workers and improvement of the international competitiveness of Japan’s farms) (Fig. 1).

In particular, we are utilizing global services provided by NTT Communications (such as cloud and security services), cutting-edge ICT services provided by NTT Group companies (such as wireless technology, weather information, and map information), and fault-detection and IoT (Internet of Things) technologies based on artificial intelligence [9] (mainly being researched and developed at NTT laboratories), in order to upgrade agricultural machinery and farming support systems provided by Kubota. Through these upgrading efforts, we plan to promote R&D and provide services leading to value creation in the agricultural field by improving international competitiveness (by volume production of high-quality farm produce) and by visualizing and automating farming to improve its operational efficiency.

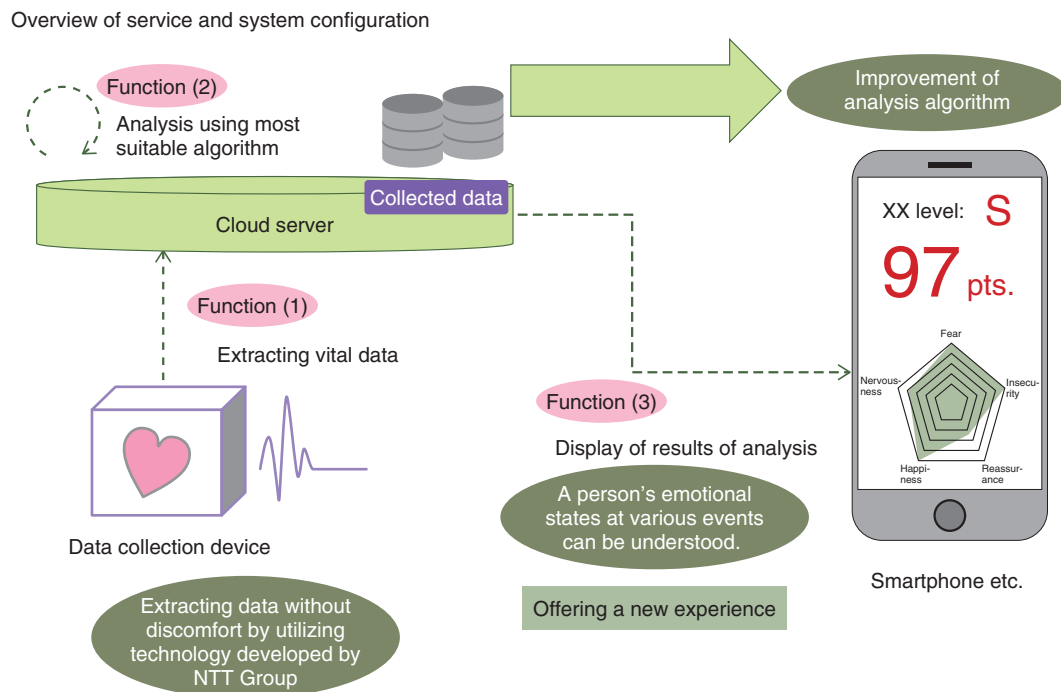


Fig. 2. A service for *visualizing the heart*.

## 2.2 Development of a service aimed at creating new markets: *visualizing the heart* by utilizing vital data

In 2015, NTT WEST—in collaboration with NTT Smart Connect, Aichi Prefectural University, and NTT—launched a service called *visualizing the heart* [10]. This cloud-type service can analyze people’s emotions by analyzing a person’s pulse-wave data (measured by surface-type pulse-wave sensing technology developed by NTT laboratories) and applying an algorithm for deducing changes in a person’s emotional state (developed by NTT WEST in collaboration with Aichi Prefectural University) (Fig. 2).

This service is intended to open up a new market that provides new value by utilizing vital data. At the Umeda Haunted House 2015 event (sponsored by Mainichi Broadcasting System, Inc., and held from July 10 to September 6, 2015), the fear people were experiencing was *visualized* by applying the *visualizing the heart* service. This service was also utilized at Smart Hikari Futsal (jointly sponsored by Tokyu Sports Oasis, Inc., Goldwin Inc., and NTT WEST, and held from January 24 to March 27, 2016) to visualize the amount of exercise of volunteer subjects. Furthermore, on the Smart Hikari Comedy Theatre show (jointly hosted with Yoshimoto Kogyo Co., Ltd.

and performed from February 3 to March 28, 2016), peoples’ laughter was visualized (with a laughometer) by utilizing this service. To visualize laughter in this manner, the service applies an analysis algorithm developed by NTT laboratories.

## 3. Future development

In this article, examples of our latest efforts concerning co-innovation activities were described. NTT Service Evolution Laboratories will continue to promote co-innovation in cutting-edge R&D under the aim of creating value in collaboration with NTT Group companies and partners in various fields.

## References

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He received a B.E., M.E., and Ph.D. in engineering from Keio University, Kanagawa. He joined NTT Cyber Space Laboratories in 1999, where he led a virtual reality and cyberspace R&D project and developed collaboration systems. He spent time at the NTT Group San Jose Office, USA, where he was involved in incubating a new business endeavor with venture firms. He joined NTT Service Evolution Laboratories in 2015, where he is involved in co-innovation promotion. He is a member of the Institute of Electronics, Information and Communication Engineers, the Information Processing Society of Japan, and the Virtual Reality Society of Japan.