

## Generating New Value with xICT —Advancing B2B2X Business—

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### Overview

This article introduces NTT Group initiatives to promote the B2B2X (business-to-business-to-X) business model. The content of this article is based on a lecture presented by Hiroo Unoura, NTT President and Chief Executive Officer, at NTT R&D Forum 2017 held in February 2017.

*Keywords: ICT, B2B2X, big data*



### 1. Changes in the business environment

Information and communication technology (ICT) has evolved considerably over time as reflected by the adoption of Internet protocol, expansion of broadband and mobile networks, development of compact terminals, and advances in processing speed. The use of cloud computing has also progressed. In contrast to the past model of centralized computer processing on mainframes, devices and servers now interact with each other to perform complex forms of processing.

Against this background, NTT business is undergoing a major transformation. Unlike the telephone era in which device and network services were provided in an all-in-one manner, customers today use a variety of services in combination. Here, the participation of diverse players has greatly broadened the choices available to service users (**Fig. 1**).

In this type of era, what does it mean to be competitive? This is an era in which diverse ICT-based services are provided by not only the communications industry but also other industries or business areas, and users are able to freely select which services they would like to use. It is also easy for users to switch to other services, which means that service providers must make an effort not just to be selected once but also to be continuously selected. This ability

to be continuously selected as a service provider is what I believe to be the meaning of competitiveness from here on.

How can a service provider be continuously selected? In this era, it is extremely difficult for a single company to meet the wide variety of user needs, so collaborative ability, ability to initiate collaboration, and ability to accept collaboration are important for being continuously selected.

### 2. Basic concept of medium-term management strategy

In our medium-term management strategy announced in May 2015, I stated that NTT would

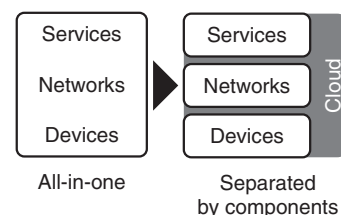


Fig. 1. Changes in the business environment.

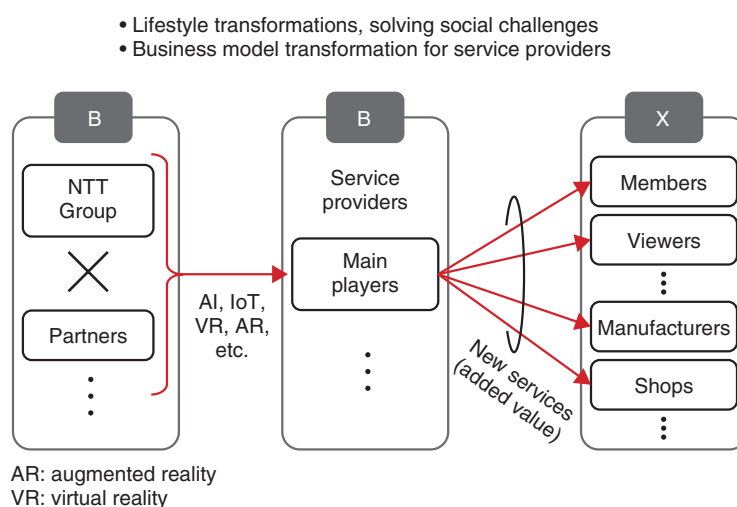


Fig. 2. Direction of initiatives for B2B2X model.

promote the business-to-business-to-X (B2B2X) business model. Various predecessors of mine came to create visions foreseeing the digital society of today, such as the Information Network System (INS), Visual, Intelligent, and Personal (VI&P), Multimedia Vision, and Resonant Vision. In the past, when the plain old telephone service played a leading role, telecom companies were the main players in providing services to customers directly. We have now entered an era in which networks are selected not as a single service but in combination with applications and services as a package. In this business environment, telecom companies are no longer the main players but simply one option among many; that is, we have become “one of them.” I declared, however, that we would be viewed as “one of them” with value.

With this in mind, we assigned the three letters making up “NTT” to three key expressions: we let the first letter ‘N’ stand for Next Value Partner, the second letter ‘T’ for Transformation, and the last letter ‘T’ for Trusted Solution. A major pillar of this medium-term management strategy was our own self-transformation to promote this new B2B2X model as a value partner that can help transform the business models and lifestyles of a wide range of users.

### 3. Direction of initiatives for B2B2X model

I would like to see the creation of many kinds of value for society through the B2B2X model. Moreover, I would like to see the creation of a new ecosystem based on collaboration with diverse partners. To

create new services and added value toward lifestyle transformations and resolving social issues, the NTT Group will support service providers—the second ‘B’ in B2B2X—in transforming their business models. Here, the value that NTT can provide service providers can take various forms, such as artificial intelligence (AI), Internet of Things (IoT), and other advanced ICT technologies, user interface technologies, and security tools. I believe we can support the creation of new value in this way.

The B2B2X model represents our transformation from one type of business model to another. In the traditional model, the NTT Group provided services directly to either individual or corporate consumers to increase revenue. In the B2B2X model, we collaborate with diverse partners to deliver added value to consumers through a wide range of service providers (**Fig. 2**).

### 4. Progress of B2B2X initiatives

In this section, I would like to introduce several initiatives that represent our progress in promoting the B2B2X model. In April and September of 2015, we concluded respective comprehensive partnership agreements with Fukuoka City and Sapporo City to help find solutions to key social issues enveloping each of these cities. One example of the contributions we have so far made to these cities is the use of Wi-Fi\* and other techniques to analyze the routes taken by

\* Wi-Fi is a registered trademark of Wi-Fi Alliance.

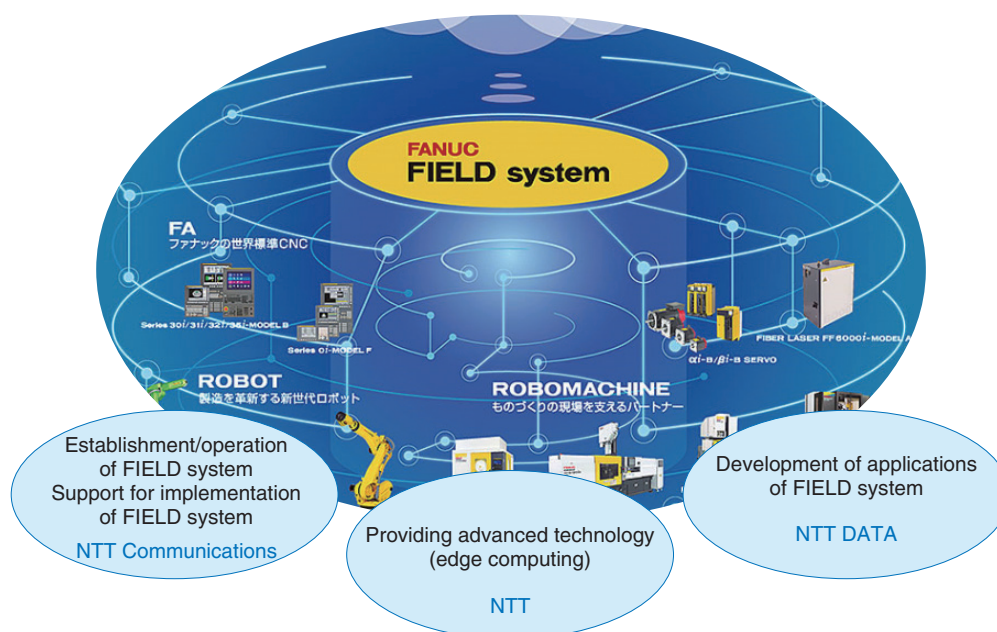


Fig. 3. Example 1 of B2B2X model.

inbound tourists, the places they go for sightseeing, and what types of items they tend to purchase.

Moreover, since April 2016, we have been pursuing collaborations with service providers and main players representing the second 'B' in B2B2X, such as SHOCHIKU Co., Ltd., Kubota Corporation, and the J.League (Japan's professional soccer league). In this article, I would like to describe, in particular, our collaborative efforts with FANUC CORPORATION, SHOCHIKU, and Le Tour de France.

#### 4.1 FANUC

FANUC is a global supplier of factory automation and robot services. It aims to provide novel and smart manufacturing sites by connecting various types of machine tools and devices used on manufacturing floors to the network and by using the big data created by such connections in creative ways. This is achieved by the FANUC Intelligent Edge Link and Drive (FIELD) system.

Through collaborations with Preferred Networks, Inc. and other partners, the NTT Group has supported FANUC to develop and commercialize the FIELD system by providing AI and edge computing technologies. In this effort, the NTT laboratories have been in charge of edge computing technologies, while NTT Communications and NTT DATA have respectively been handling system construction/

operation and application development (**Fig. 3**). Combining AI and edge computing technologies in this way enables distributed machine learning, while performing real-time processing of the data collected from machines at the edge (locations near machine tools) enables these machines to cooperate with each other in a flexible, immediate, and intelligent manner. The goal here is to achieve advanced manufacturing at a level not yet seen and to make them into a de facto standard.

#### 4.2 SHOCHIKU

I would like to introduce here our efforts in achieving a new way of enjoying kabuki performances through collaboration with SHOCHIKU. In April 2016, the Niconico Chokaigi (super conference) sponsored by Dwango Co., Ltd. included a public performance of "Cho Kabuki." Through the use of the immersive telepresence technology "Kirari!®" developed by NTT laboratories, the kabuki actor Shido Nakamura appeared together with the vocaloid Hatsune Miku and also performed alongside duplicates of himself (doppelgangers) on stage (**Fig. 4**).

Niconico Chokaigi is a major event attended by many young people. SHOCHIKU has said that it would again like to present kabuki in new ways at Niconico Chokaigi in 2017. It expects to attract new fans to kabuki and young people in particular by



Clockwise from top left: Poster of Cho Kabuki, performance of Cho Kabuki, poster of kabuki in Las Vegas, and poster of Kabuki Virtual Theater

Fig. 4. Example 2 of B2B2X model.

adding a modern touch to traditional kabuki with new forms of ICT. I believe that an initiative of this type can become a powerful weapon in expanding consumption, a key element of the Japanese economy.

In addition, in May 2016, stage greetings from the kabuki actor Somegoro Ichikawa, then in Las Vegas as part of a kabuki performance, were transmitted in real time to a remote showing at Haneda Airport. This event included a question and answer session with reporters just as if he were actually there standing in front of them. At the same time, some people at the event were asked to put on a head-mounted display as part of a virtual reality experiment that gave them the sensation of being inside the Las Vegas theater.

Furthermore, for two days on March 11 and 12, 2017, the Kumamoto prefectural government held a “Kabuki Virtual Theater” free to the public as part of a “prayer for recovery” in the wake of the Kumamoto earthquakes of 2016. Though a virtual performance, I

believed it enabled many people to enjoy a work filled with a high sense of presence just as if Somegoro Ichikawa and other kabuki actors were performing right before their very eyes.

### 4.3 Le Tour de France

Dimension Data, a member of the NTT Group, has formed a technology partnership with Le Tour de France, the greatest cycling race in the world. It provides a mechanism that identifies the speed and location of each rider by placing a sensor under the saddle of each bicycle and transmitting positional information to Dimension Data’s Big Data Truck (Fig. 5). This information is used to create video that can be delivered to televisions, smartphones, and other devices in real time. Spectators can then see for themselves how the riders are lining up in a completely new and enjoyable way.

This mechanism not only represents an evolution in



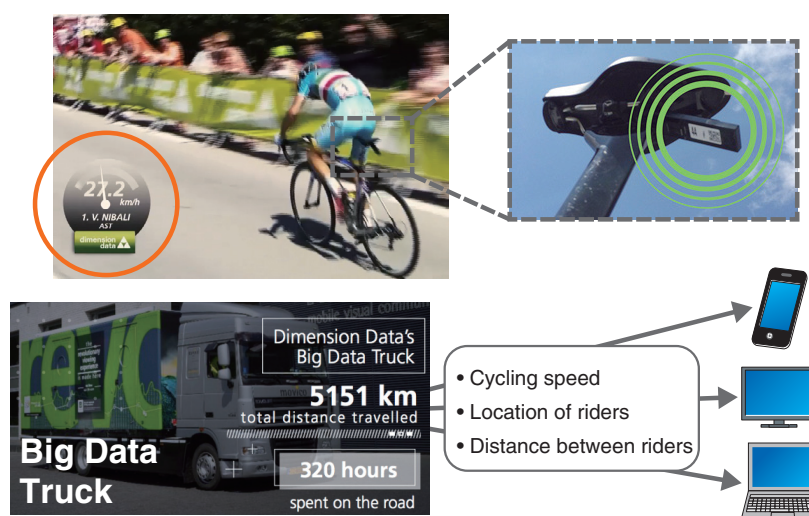


Fig. 5. Example 3 of B2B2X model.

the way that spectators enjoy Le Tour de France but also an evolution in the way that team coaches and riders compete. In July 2016, I myself was in France for Le Tour de France and heard a team coach comment that “I’m totally exhausted from all the data that are now available for rider support!” In fact, it will eventually become possible to deliver the vital signs of each rider by combining this mechanism with other types of devices. I think that the addition of such information should enable the coach of a competing team to make more strategic decisions and to even change training methods if necessary.

What I think all of us at NTT have in common is a desire to support service providers and other players representing the second ‘B’ in B2B2X in growing a successful business. To promote consumption and economic growth, it is essential that the business ventures of main players, that is, service providers, are successful. Providing support in this way should lead to our growth as well.

### 5. Further promotion of B2B2X model

I will now describe some important points for promoting the B2B2X model even further. Most important of all is coming up with a clear definition of ‘X’ in B2B2X, that is, the service end users. Doing so should bring into view a system of collaboration between NTT and service providers and partners as well as best business models, customer touch points, etc.

Let me give some examples of this approach in the

field of self-driving cars. What kind of interfaces would be needed to enable the elderly and people with mobility problems or disabilities to use self-driving cars? No doubt, voice input and other types of interfaces would be needed. Moreover, in the case of voice input, some type of technology would be needed to ensure that the person’s voice was clearly understood in a noisy environment, and in Japan, there would also be a need for technology that could identify different dialects. Here, instead of preparing special interfaces for each and every car, a better approach would be to develop cars that could support the circumstances of individual users from the cloud based on common specifications.

However, a self-driving car equipped with such interfaces and various types of safety equipment is apt to be expensive. Plus, considering the frequency of usage, the business model itself would not likely be a self-ownership type but rather a shared type. What kind of players would then be best for providing such a service based on a shared type of business model? I believe that local municipalities might make a positive contribution in this regard, and that local taxi companies and public transportation systems might team up as second B players.

Here, it would not do for automobile manufacturers or NTT to play the role of service provider. I think that supporting the provision of a new business model or service as the first ‘B’ in B2B2X would be more effective for speeding up the development of self-driving technology.

In this way, instead of a product-out approach based

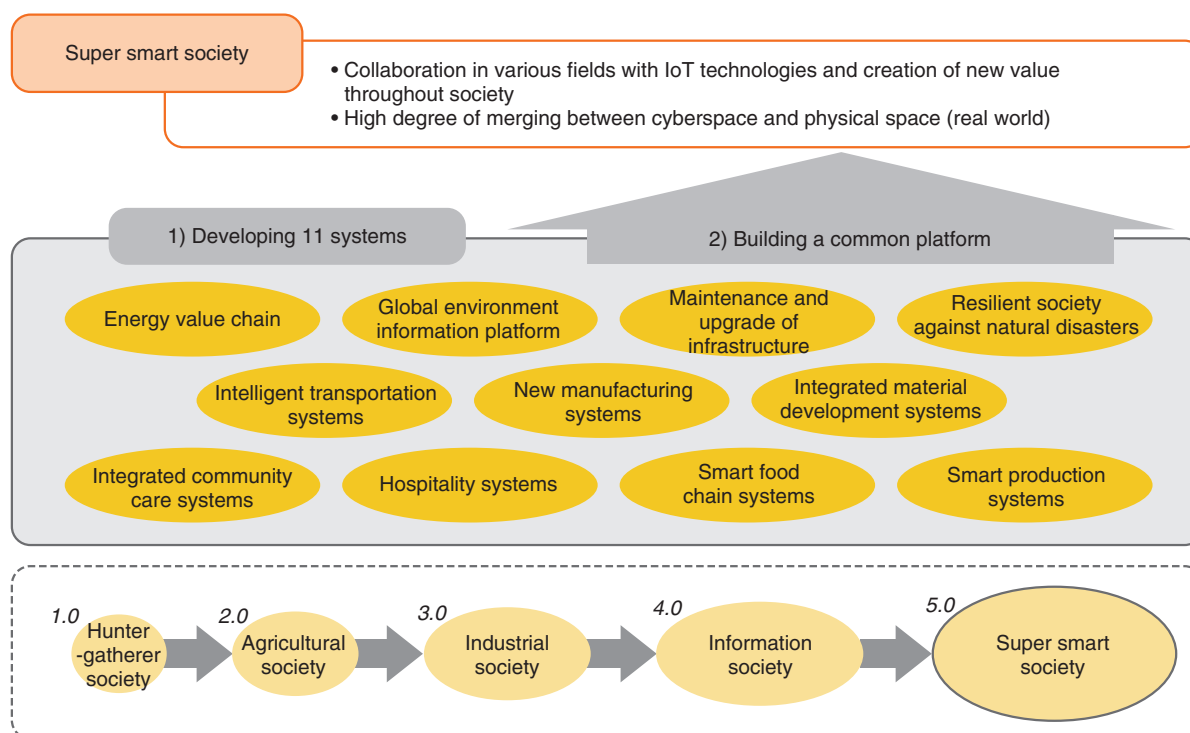


Fig. 6. Society 5.0 (The 5th Science and Technology Basic Plan).

only on technology, I believe, as I stated above, that finding a clear definition of 'X' in B2B2X, or in other words, defining what are new values or new sensations, will lead to new partners and new business models.

## 6. Japan revitalization by Society 5.0

The Cabinet Office of the Government of Japan is promoting the creation of a "super smart society" (Society 5.0) under the theme "New Initiatives toward Japanese Industry of the Future and Social Transformation" as The 5th Science and Technology Basic Plan (Fig. 6).

The keyword "Society 5.0" signifies how society has become progressively smarter through its transformation from a hunter-gatherer society to an agricultural society, industrial society, and information society, and the coming super smart society. As a broad theme that includes Industry 4.0 (Fourth Industrial Revolution), I acknowledge that Society 5.0 is precisely the next big concept that Japan should adopt in future policy making.

In response to this Cabinet Office policy, the Japan Business Federation (Keidanren) has begun its imple-

mentation by drafting an action plan based on key subthemes underlying Society 5.0 [1].

Specifically, a future society as envisioned by Keidanren can be broken down into five subthemes: a smart society undaunted by the decrease in population; a society in which every individual, including elderly people and women, can actively participate; a safe and secure society in both cyber and physical spaces; a society that connects cities and outlying regions, making for a comfortable and pleasant life anywhere; and an environmentally and economically sustainable society. In addition, cities, regions, objects/things/services, infrastructure, and cyberspace have been designated as specific study areas.

In this way, the government and Keidanren, that is, the public and private sectors, are promoting Society 5.0 with the aim of building the society of the future. Here, AI, big data, and IoT will play important roles in making Society 5.0 a reality. IoT will enable a wide variety of real-world data to be stored as big data, and AI will enable that data to be analyzed, so we can expect a wide range of social and global issues to be solved in this way. However, such social issues cannot be solved if companies and local municipalities keep their data to themselves. It is essential that all

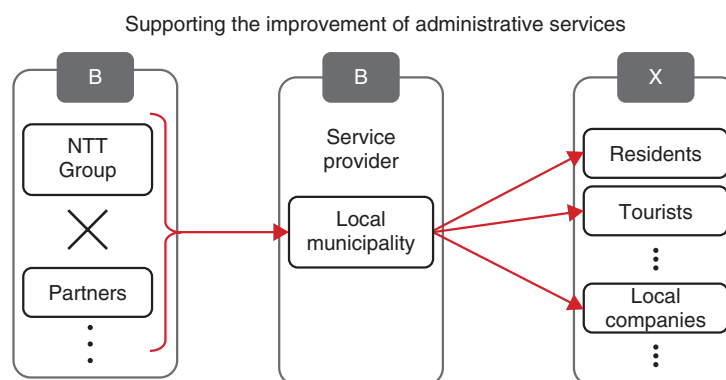


Fig. 7. Data sharing with local municipality as hub.

data in society be shared across industries and fields.

### 7. Concerns in data usage

A key issue in the use of data throughout society is the handling of personal data. Who does personal data belong to? Do you, the individual, own it? Or does it belong to the companies that gather the data?

The EU approved the right to data portability in April 2016. In Europe, legislation is moving forward to enable individuals to retrieve their personal data—for example, a purchasing history gathered by Google or Apple—and to transfer that data to other business operators if so desired. In Japan as well, the handling of personal data is a very sensitive issue, and I think there is a need here to proceed carefully.

Rather than obsessing about the ownership of personal data, I have proposed to various parties the concept of treating various types of data as belonging to society and citizens.

With an eye to appropriate handling of such sensitive information, the NTT laboratories have been developing secret-sharing and secure multi-party computation technology. This technology securely stores personal data through encryption and distributed storage, and at the time of data analysis, enables only the results of analysis to be obtained without data analysts having to touch the raw data. We are using this technology in initiatives that aim to advance the use of big data throughout Japan.

There are also other issues in addition to the handling of personal data that must be resolved to achieve data sharing and data usage throughout society. First, there is a need for widespread gathering of good-quality data. I believe that the biggest risk in the AI and big data society of today is that smart AI will

routinely process malicious or intentionally erroneous data. For example, traffic signals may behave in an abnormal manner on the basis of erroneous data, and control equipment in a power plant may automatically stop if it detects something it considers to be dangerous. The widespread gathering of good-quality data will require security technology that can remove such erroneous data. It will also be necessary to ensure fair usage in data gathering. What exactly is “fair usage?” As I explained earlier, data gathering to improve community services and solve social problems is a fair objective. Of course, there is a need for encryption to protect personal data and a check system to prevent abuse. I also think that the standardization of data formats and ciphers is necessary.

### 8. Data sharing with local municipality as hub

I believe that one method of resolving these data sharing and usage issues is to promote the gathering and use of big data with local municipalities serving as hubs. Considering the need for combining and handling a wide variety of data to solve social issues, I think there would be a problem allowing a single company to gather and use such information.

In particular, I believe that opening up the data held by a local municipality, such as demographics, maps, disaster prevention measures, and sightseeing information, and providing the big data held by companies to industry as public property can expand possibilities in the integrated use of all kinds of data and revitalize local business.

The concept of a local municipality serving as a service provider to improve community services is shown in **Fig. 7**.

The NTT Group, working with partners such as

FANUC	IoT platform	Edge computing technology
		IoT data exchange technology
SHOCHIKU	Cho Kabuki Kabuki in Las Vegas Henshin Kabuki Kabuki Virtual Theater	Immersive telepresence “Kirari!”
		Light projection technique “HenGenTou”
		Angle-free object search
SAP	Transportation safety solution	Wearable vital sensing fabric “hitoe”
KUBOTA	ICT solutions for agriculture and water infrastructure	AI-related technologies “corevo®”
Local municipalities	Regional revitalization through data sharing and usage	Secure computation system
		Anonymization technology

Fig. 8. Technologies underlying B2B2X model.

Panasonic Corporation and Hitachi, Ltd., would like to provide local municipalities with support tools. We would like to see local municipalities take on a leadership role in data sharing and data usage within their communities with the aim of improving community services and expanding local business, as I just mentioned. Although we are talking about local municipalities here, we know that undertaking this initiative simultaneously throughout the country would be quite difficult from an operations point of view. We have so far concluded agreements with Sapporo City and Fukuoka City to get this initiative started.

I would like to see this initiative with local municipalities evolve so that they shift to the first ‘B’ in B2B2X while local industries and companies act as the second ‘B.’ In this way, I would like local municipalities, NTT, and other players to become partners in supporting local industries and contributing to the expansion of local economies. I see this type of activity as another major theme in Japan that can lead to

regional revitalization.

## 9. Technologies underlying B2B2X model

Finally, examples of technologies that NTT laboratories and NTT Group companies are providing to service providers and other players making up the second ‘B’ in B2B2X are shown in **Fig. 8**.

Going forward, the NTT Group will continue to pursue collaboration with diverse partners to generate new value and new sensations, help grow the Japanese economy, and help find solutions to a wide variety of social issues.

## Reference

- [1] Keidanren, “Toward Realization of the New Economy and Society - Reform of the Economy and Society by the Deepening of ‘Society 5.0’-,” 2016.  
[https://www.keidanren.or.jp/en/policy/2016/029\\_outline.pdf](https://www.keidanren.or.jp/en/policy/2016/029_outline.pdf)