Let's Harness Our Rich Fountain of Knowledge, Build High Mountains with Passion, and Bring Innovation to Society

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Abstract

NTT Service Innovation Laboratory Group plays a vital role in transforming cutting-edge technologies into tangible value in the form of services and implementing them practically in society. The laboratory group is striving to actualize the endless possibilities that can be created by combining the future society and digital information. We spoke with Tomoyuki Kanekiyo, senior vice president, head of NTT Service Innovation Laboratory Group, about the laboratory group's notable achievements and new challenges for fiscal year 2026.

Keywords: R&D, social implementation, AI model

Our mission is to connect the digital and physical worlds at the center of social implementation

—Tell us about NTT Service Innovation Laboratory Group.

The mission of NTT Service Innovation Laboratory Group is to lead the rapidly evolving field of artificial intelligence (AI) technology and bring about technological innovation in both the cyber world (digital) and the physical world (real). We do not simply delve into technology; we also have a strong responsibility to apply that technology to bring about innovation in society. Our laboratory group is comprised of three research laboratories.

The first is NTT Human Informatics Laboratories, which is focusing on human understanding and researching NTT's large language model (LLM) called "tsuzumi" as well as world models that understand the real world.

The second is NTT Social Informatics Laboratories, which is researching technologies to strengthen information security and cyber-risk countermeasures and supporting safe social implementation of technologies through interdisciplinary research into ethics, laws, and privacy protection.

The third is NTT Computer and Data Science Laboratories, which is researching the multi-computing infrastructure needed to handle the massive computational resources required for audio-media processing, quantum computers, software engineering, and generative AI.

From an overall perspective of NTT laboratories, there are organizations that handle the fields of networks, services, and devices. Our laboratory group is positioned closer to services. Each organization in

NTT laboratories is responsible for the phases covering basic research, applied research, and practical implementation. Our unique feature is that we focus primarily on applied research and cover the basic research to areas either just before or even close to practical implementation.

We pride ourselves on being the top research institute in Japan in terms of both research and implementation. While current development of AI is largely determined by capital strength, we are focusing on creating "the next big thing" that is not just about capital amount; in other words, we want to invent things based on completely new ideas and pursue lightweight AI models and superior performance in specialized areas.

The greatest strength of NTT laboratories as one is our comprehensive capabilities, which cover a wide range of areas from devices to AI and networks. Global companies like those of GAFA (Google, Apple, Facebook, and Amazon) frequently change personnel in accordance with trends; however, organizations like NTT, where researchers with a wide range of expertise collaborate and continue to accumulate knowledge, are rare—even on a global scale. In the case of research on quantum computers, optical-device experts, quantum theorists, and software experts can work together in harmony under one roof. The overwhelming synergy created in this way is a competitive advantage that NTT can be proud of.

—Fiscal year 2025 was a very dynamic year as exemplified by the explosive advances in generative AI. Could you tell us about any notable research results in your laboratory group?

One of our major achievements in fiscal year 2025 was the release of the second generation of NTT's LLM "tsuzumi 2" in October. While inheriting the characteristics of the first generation—being lightweight, made entirely in Japan, and secure—tsuzumi 2 has achieved the world's highest Japanese-language performance among models with the same parameter size. In certain business domains, it has reached a performance on par with larger models such as GPT-5, and we will now begin full-scale use of tsuzumi 2 in operating companies.

The biggest stage for embodying the Innovative Optical and Wireless Network (IOWN) was our exhibit at the NTT Pavilion at Expo 2025 Osaka, Kansai, Japan. It was not a typical exhibition, but rather a large-scale technology demonstration involving actual operation over a six-month period.

At the Expo, we unveiled the following four innovative technologies. The first technology was "spatial transmission." Taking advantage of the low-latency characteristics of the IOWN All-Photonics Network (APN), we transmitted not only video and audio of a live performance of the female pop group "Perfume" but also the vibrations (steps) underfoot and the presence of the performance space to a remote location in a way that provided an experience that made the

viewer feel as if they were in the same place. The second technology, "Fure-au Denwa" (where "fure-au" corresponds to "haptic interaction" and "denwa" to "telephone" in Japanese), enabled emotional communication by conveying the sense of touch that was previously difficult to achieve through telecommunications. The third technology, "Another Me™," enabled people to experience a concept of expanding one's various opportunities by realizing new possibilities through dialogue with one's own alter ego. The fourth technology, "cross-lingual speech synthesis," enabled us to generate multilingual speech from the speech of a famous athlete in one language. We implemented introductory announcements in six languages while preserving the athlete's voice quality. Operating these technologies for half a year in the demanding environment of the Expo demonstrated our laboratory group's implementation capabilities.

Outlook for fiscal year 2026: The challenge of natural dialogue and real-world understanding

—I was impressed when I had the chance to experience the technologies that you demonstrated at the Expo. NTT technology was also showcased at the very popular performance "Cho Kabuki" at the Kabukiza Theatre in December 2025. I'm really looking forward to seeing what priority areas you will tackle in fiscal year 2026.

We will further deepen our achievements to date and move into a phase where AI can work more closely with humans and operate in the real world. Our first area of focus is the evolution of generative AI, particularly, human-like AI dialogue. Until now, AI dialogue has been unnatural; it pauses after the human has finished speaking. However, we aim to refine—and implement in society—a model that can provide natural back-channel feedback and appropriately pause between utterances in a manner that enables back-and-forth conversations with humans.

We are also pursuing a world model—a model for understanding the real environment. This model functions as the "eyes and brain" for mobility and robotics in a way that forms the core of physical AI. Although this field is another fiercely competitive, we intend to compete seriously by leveraging NTT's long-cultivated expertise in media processing. We will also advance the areas supporting these models, such as security, robotics, and AI social sciences, in a balanced manner.

When deciding on research themes like the ones that I described above, what I value most is the quality of the question. It's not enough to find something new technologically; that is, from the start, you need to have specific questions concerning social implementation, such as "Who will use it and how?" and "What kind of business model will be appropriate?" Research doesn't end without answering those questions; it's important to think of the entire process—from the initial planning stage to deployment (service creation)—as your own problem. Since the AI field is uncertain, the correct answers to those questions are unknown, so it is necessary to formulate detailed hypotheses and cycle through verification and implementation in a short time. I believe that this rapid chain of questions will lead to innovation.

—It has been six months since you were appointed as the head of NTT Service Innovation Laboratory Group. In consideration of your journey since joining NTT, could you tell us about your attitude towards your work?

After joining NTT in 1992, I was mainly involved in delivering technology in society, such as developing ISDN (integrated services digital network) terminals and launching IPTV (Internet protocol television) platforms, and I've always found great value in seeing technology become a service that customers are willing to pay for. Since taking up my current post, I've come to realize just how high the expectations of those around me are for our laboratory group.

To realize those expectations, it is essential to ensure that our research results are "spread to the outside world." As the head, I strive to manage the laboratory group to spread our results out to the world, and at the core of my management is the sense of responsibility and determination that I gained from my experience in the field. In the field of practical implementation, it is necessary to take responsibility for completing and releasing products by strict deadlines. To fulfill that responsibility, it is necessary to have a strong determination to "stick with it" from the planning stage of a product onwards. The experience that I gained in my past development work of organizing requirements in a short period and delivering products on schedule remains ingrained in me to this day.

I also believe in not answering right away. If the head gives answers too easily, it will take away the most-important process: researchers thinking for themselves, trying and failing, and learning from their failures. I value an attitude of supporting researchers in realizing somethings and acting on their own.

Even as remote work becomes more common in organizational management, I make sure to visit each of our bases, such as Yokosuka, Musashino, Shinagawa, and Otemachi, and talk directly with our staff members and get a feel for their concerns and inspiration while I continue to ask them questions. Through this kind of close communication, I hope to unite the organization's aspirations.

Goro Yoshida's philosophy of the "fountain of knowledge" and Hiroshi Ishii's "mountain building" approach

—As the head of a research institute with hundreds of researchers with diverse specialties, what kind of management style do you adopt?

A research institute is not an organization that moves forward by the force of management. We watch over and support our researchers, who have amazing personalities and talents, so that they can move freely in the right direction. I believe that encouraging researchers to take on challenges independently by supporting and accompanying them, rather than managing them through instructions and orders, will make the most of their diverse talents.

Researchers should be free to pursue their ideas. However, in many areas, we can use our experience and techniques as leaders to help researchers move forward and convey their message to the outside world. The question is "How can we bring researchers' aspirations closer to innovation?" I believe my job is to help our researchers give meaning to their ideas and organize them appropriately.

What's more, I don't want researchers to remain confined within their laboratories; rather, I want them to engage in dialogue with operating companies and external stakeholders to get a firsthand feel for how their technology functions in society and what is lacking. I believe that personal contact with the outside world can be an opportunity to transform research "materials" into "value."

—In today's rapidly changing world, what attitude would you like future researchers to take in regard to their research?

I'd like to offer two important words of advice to all researchers. As for the first, I'll quote Goro Yoshida, the first director of the Electrical Communication Laboratory of the Ministry of Communications (the predecessor of NTT laboratories): "Do research by drawing from the fountain of knowledge and provide specific benefits to society through commercial development." Those words are our starting point. The trinity of "research, development, and deployment" is the essence of innovation, and as corporate researchers, I want researchers to be committed to bringing to the world "technology that customers will be willing to pay for and use." The moment technology is born, it is worth nothing. I want researchers to enjoy the process of refining it and delivering it to society as their own personal endeavor.

As for the other words of advice, I'll quote the "mountain building" approach advocated by Professor Hiroshi Ishii of the MIT Media Lab. He said metaphorically, "Build a mountain that no one has climbed before, climb it yourself, and show others the path that they will want to climb." I want researchers not only to climb existing mountains but also to imagine their own high mountain and be prepared to climb it to the top and implement their achievement in society.

To all future researchers, approach your research with the following attitude and a sense of balance. First, take pride in your research, ask your own questions, and act accordingly. Speed is also important: don't just take your time to do your research; also make every effort to release it promptly and get feedback. Next, be aware of social implementation. We must not leave technology at the material level; we must take responsibility for transforming it into social value. Using your power to create a high mountain, set your own unique vision, and break into uncharted territory. Finally, connect with the outside world. You should not be confined to the laboratory; rather, you should always be aware of external perspectives and the speed of development.

NTT has accumulated a vast amount of knowledge over its long history. Let's harness this rich fountain of knowledge, build high mountains with passion, and bring innovation to society.

Interviewee profile

■ Career highlights

Tomoyuki Kanekiyo joined Nippon Telegraph and Telephone Corporation in 1992 and became senior manager in charge of R&D planning at NTT Service Innovation Laboratory Group in 2017, vice president in charge of R&D vision at the NTT Research and Development Planning Department in 2021, and vice president in charge of R&D strategy at the Research and Development Planning Department of the Research and Development Market Strategy Division in 2023. He assumed his current position in June 2025.