

## Bridging the Gap among Research, Development, and Business Departments to Achieve a Common Goal



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Integrated Innovation Center**

### Overview

In addition to the three laboratory groups that have been the cornerstones of NTT's research and development (i.e., NTT Service Innovation Laboratory Group, NTT Information Network Laboratory Group, and NTT Science and Core Technology Laboratory Group), the NTT Innovative Optical and Wireless Network (IOWN) Integrated Innovation Center (IIC) was established on July 1, 2021 to extend technology development closer to the commercial implementation stage. IIC is striving to create and implement photonics-electronics convergence technology, which fuses optical and electrical signals and is key to enable IOWN. We interviewed Hidehiro Tsukano, head of IIC, about the purpose of the establishment and mission of IIC as well as the qualities required of top management.

*Keywords: IOWN, photonics-electronics convergence, R&D*

**Realize the Innovative Optical and Wireless Network (IOWN) concept and translate the real world into the digital virtualized world through introducing photonics-electronics convergence technology to contribute building a sustainable society**

*—You were appointed the head of the newly established NTT IOWN Integrated Innovation Center (IIC). Could you give us some details about the center?*

Under the IOWN initiative announced in 2019, NTT aims to implement an innovative network and information-processing infrastructure introducing

photonics-electronics convergence technologies by 2030. Tasked with strengthening our research and development (R&D) capabilities toward that aim, IIC began operation in July 2021 by re-assembling the R&D resources of NTT laboratories.

IIC consists of three centers: (i) NTT Network Innovation Center (NIC), which embodies the IOWN concept and is responsible for R&D of innovative network systems that support the integration of mobile and fixed networks; (ii) NTT Software Innovation Center (SIC), which promotes R&D of innovative computing infrastructure for implementing IOWN; and (iii) NTT Device Innovation Center (DIC), which promotes R&D of photonics-electronics converged devices and information-processing



devices for enabling IOWN.

Under this new organization, we will bring together and integrate device technology, network technology, and software-infrastructure technology to develop a game changer in the world of technology and revitalize technological capabilities of Japan. With the spread of information and communication technology (ICT), the global economy has become increasingly borderless, and the meaning of the network and information-processing infrastructure is becoming increasingly important. We believe that it is essential to collaborate with global vendors and will accelerate our R&D by actively engaging with IOWN Global Forum and encouraging development with each vendor.

IIC is an R&D organization, but the name includes “Center,” rather than “Laboratory,” which I think has a significant meaning. I believe the term “Center” requires a change in mindset to focus on development rather than research. Although NTT laboratories have participated in developing products for practical use, their focus has been more on research. By positioning this development closer to business, we are expected to work with our operating companies to develop business and build products that can be used by players outside the NTT Group. Through these activities, we hope to make a significant contribution to society, which is the NTT Group’s primary mission that has been built up over the years since the days of Nippon Telegraph and Telephone Public Corporation.

*—I think that to bridge the gap between R&D and commercialization, it is necessary to understand both sides. Have you made use of your experience thus far to do so?*

After graduating from university, I joined Fujitsu Limited, where I was first assigned to the purchasing department. Since then, I have been involved in semiconductor and network businesses. As senior executive vice president and chief financial officer (CFO), I gained experience in identifying new business areas from a management perspective with limited resources. I have also built many connections with executive management and key people in global vendors of semiconductors and ICT-related products.

To realize IOWN, it is essential to select various technologies, determine the business feasibility of those technologies, and collaborate with many partners, including through IOWN Global Forum. I believe that my experience can be applied in these areas. The first step in these efforts is to create a *super white box* that enables ultra-low power consumption and tremendously low latency transmission through the application of photonics-electronics converged devices, etc. It will probably take about 10 years to get through, but we hope to accomplish it in that period. We also would like to redirect and reinforce our R&D on Business Support and Operations Support System in an area of Total Operation Management. We want to materialize the vision of IOWN by developing these specific technologies while matching them with the roadmap for IOWN.

## Do the right thing right

*—You have been at the head of various organizations and offices. What are your thoughts on the qualities required of a top executive?*

I think it is important for the people in top management to have beliefs. Of course, such beliefs should not be distorted. By listening to others through various interactions and examining if one's beliefs are truly correct, you can build them into something unshakable. During this process, it is important to be flexible enough to admit when you are wrong and to correct yourself swiftly.

The truth is that there is only one truth, so it is a matter of repeatedly talking to experts and others to understand mechanisms and principles while comparing them to your beliefs and considering plans to make those beliefs a reality.

My belief that I have built up in this way is to “do the right thing right.” Although the meaning of “right” may be completely different from different viewpoints, “what we want to achieve” is the same. I therefore investigate how to do something right, listen to people, and deep dive into whether the decision is right or should be implemented. I don't think I became able to do this overnight, that is, it is the accumulation of various experiences that I had over the years.



*—It is important to listen to the words of others and be exposed to their knowledge so that you can make the right decision.*

I think that top management also needs the ability to communicate clearly and directly. I joined Fujitsu in 1981, and at that time, Japan's national power was on the rise. As far as I remember, after the USA, Japan used to be the world's second largest producer and consumer in information technology and electronics market, but now it has been overtaken by China. I think this outcome shows that Japan has been resting on its past laurels, while others have been growing faster than Japan.

In addition, the so-called “excellent companies” have established their own specialties, have their market share in their countries, and have a large presence in foreign countries. They also have a business-level language skill of the country they want to compete in. In the service field, it is especially important to understand the language and culture of the target country, so my theory is that if you cannot communicate with the people of the country using their language at the closest level possible, you shouldn't compete there. It is not a simple matter of hiring local people; instead, it is important to be able to communicate directly with customers and stakeholders.

I'd say that Japan has cut corners in the area of language skills. I have almost 10 years of work experience in the USA, including half-year business trips. When I was first assigned to the role in the USA as the procurement manager of a plant with about 1000 employees, I was afraid to make phone calls in English, and I wasn't sure if I'd be able to convey what I intended. However, I thought that I couldn't carry out my duties and grow myself if that situation continued, so I made the effort to walk around the vast factory and communicate with the colleagues so that I'd become involved in all the processes under my charge. At first, I found it difficult to communicate with them smoothly, but I kept at it anyway with determination. Once I got a little more familiar with the environment, I stopped worrying about being on the phone, and after about three years, I became more confident. With that confidence, I decided to be positive and try things even if I failed. I adopted that mindset because you can't start anything if you always choose to do things on the safe side. Through such trial and error, I have learned not to be afraid of failure.



### Recommendations of John Manjiro

*—The establishment of beliefs and smooth communication is rooted in hard work.*

My motto, which was instilled in me at my integrated junior and senior high school, is “*shitsujitsu gouken*” (sincere and sturdy). Regardless whether you can succeed in accepting diverse culture, nothing will start unless you take on challenges yourself. I face everything with this attitude. Since I took up a corporate management position around 2010, I have been recommending those around me to learn about John Manjiro\*. In other words, going overseas to work. I tell people that if there is something they want to do, they shouldn’t just think about doing it only in Japan; instead, they should visit countries and try it there first.

If you have the passion to do something, the other party will meet you at least once and listen to you. To prepare for that opportunity, I think we need to cultivate our resourcefulness on a daily basis. Knowledge in the liberal arts is especially important. Painting, music, and sports are good topics for starting a conversation. The amount of interest you have in the other person may determine whether you can make the effort to cultivate your ability to respond to any topic and gain knowledge. Then, if you can share your beliefs and purpose, the relationship will grow deeper. I have realized from my own experience and the actions of senior management that it is very

important to take time to build a mutual understanding and a solid relationship even if the relationship is not directly related to business.

If you have a friend or acquaintance in common with the person you want to do business with, you can ask them to introduce you to that person so you can propose “Let’s start something together.” These relationships are what we call “communication paths.” Nothing happens overnight; therefore, we need to build up these paths from the time we join the company or even earlier. However, we can only know later the results and effects built in this manner. The results through efforts always come later, and to put it bluntly, what we have done can be evaluated and proven only by time and history.

As with all things in nature, time passes equally and fairly to everyone. I believe that it is necessary to constantly think, act, and take an interest in various things to keep improving and evolving ourselves. I think that giving up or neglecting something means that you are not moving forward or you have stopped growing and that you are being left behind the times and degenerating. In other words, it’s all about keeping the brain working, and for me, stopping growing and degenerating is frightening.

\* John Manjiro: A young Japanese fisherman whose ship was swept out to an island in the Pacific Ocean in 1841, rescued by an American ship, and studied English, surveying, and sailing in USA. He then sailed around the world and returned to Japan in 1851. He became a valuable interpreter/translator when Japan was opening up to the world at the end of its isolation period.



*—Do you have any words of advice for engineers and researchers?*

I think the purpose of science and technology has been realizing dreams or alleviating fear. Either way, I believe that it is the job of engineers and researchers to fulfill their missions of achieving something that has not been possible before. Another important purpose is to achieve cost reduction so that everyone can benefit from a developed technology. For example, in this day and age, if you want to enjoy the ultimate analog sound of vinyl records, it is said to cost around 30 million yen to prepare the conventional equipment such as vacuum tubes. The quality of the sound is said to be so good that even an amateur can tell the difference in sound quality, but it is not easy to acquire such analog equipment. On the contrary, technological advancement has enabled us to easily enjoy music in a digital format. Engineers are those responsible for evolving technology, enabling something that was not possible, and creating a society in which everyone can benefit from that technology by achieving cost reduction.

I want you to keep in mind that the R&D you are conducting as engineers and researchers can contribute to society and keep working hard every day to make it happen. I also hope that society will under-

stand the efforts of our engineers and researchers. You should be proud of yourself for conducting research to ensure that all people can enjoy the benefits of technology in the real world. In that sense, IIC's major mission is to work toward achieving carbon neutrality to curb global warming.

### **Interviewee profile**

#### **■ Career highlights**

Hidehiro Tsukano joined Fujitsu Limited in 1981, where he worked in the purchasing department, focusing on semiconductors. In his career at Fujitsu, he became head of Corporate Planning and Business Strategy Office in 2009 and representative director, senior executive vice president, and CFO in 2017. He also has served as chief strategy officer, in charge of all departments as assistant to the president. In 2019, he became vice chairman of the company. After working as an advisor to NTT Advanced Technology Corporation in 2020 and senior advisor in the Research and Development Planning Department of NTT, he assumed his current position in July 2021.