

Taking Great Pride in Being a World-leading Organization—Supporting In-house Collaboration and Open Innovation to Create Technologies for Sustainable Business Growth

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Overview

NTT Laboratories researches and develops advanced, epoch-making technologies like fiber to the home (FTTH) and the Next Generation Network (NGN). In June 2009, Hiromichi Shinohara took up the post of Senior Vice President and Director of NTT's Research and Development Planning Department. We asked him to tell us about the strategy and direction at NTT Laboratories toward the creation of an information and communications technology society and his expectations of NTT researchers.

Clarifying the portfolio and maximizing all laboratory activities

—*Mr. Shinohara, you have been director of the Research and Development Planning Department since June of this year. How do you feel about your new post?*

Six years ago, I became general manager of the Access Network Service Systems Laboratories, and in that capacity, I managed research and development of infrastructure-related projects. But now, as director of the Research and Development Planning Department, I must also manage research laboratories that deal with other fields. I have come to understand that the various research laboratories differ from each other not only in terms of technology fields but also in their present circumstances and researcher

mindsets. With these differences in mind, my role, I believe, is to create an environment that enables each research laboratory to demonstrate its particular expertise and carry out its activities without hindrance.

To maximize all activities at NTT Laboratories from here on, the approaches that we followed in developing telephone and Internet services will not work. Instead, it is important that we build up an R&D portfolio by taking into account both marketing and technology aspects and clarify the role of each and every researcher based on the portfolio.

Focusing on technologies that contribute to service creation and environmental preservation

—*What fields do you want to emphasize at present?*

As part of NTT's new Medium-Term Management Strategy of becoming a *service creation business group*, our business structure is undergoing a strategic conversion in which the sales ratio of legacy business like telephone services is slated to drop from half to a quarter while that of IP (Internet protocol) systems, solutions, and new fields will increase to three-quarters by 2012. Knowing that research and development is the source of corporate growth, I believe that NTT Laboratories must make a big contribution to new service creation and to sales growth for IP systems, solutions, and new fields that drive the growth of the NTT Group. In particular, I would like to devote more effort than we had in the past to the creation of new services enabled by optical broadband and the Next Generation Network (NGN) and to R&D that contributes to the birth of new markets.

The number of customers subscribing to optical broadband services is increasing steadily and the penetration rate of optical broadband in Japan is impressive compared with other countries. At this point, however, a shadow is falling over this increase in optical broadband customers. To further expand the optical broadband market, we must meet the following three challenges: (1) deliver new optical broadband value (services) to existing customers, (2) improve the ease-of-use, approachability, and comfort level to broaden the optical-broadband customer base, and (3) eliminate as much as possible constraints to the provision of services. To this end, we will undertake R&D from the perspectives of both services and infrastructure, and to cultivate new markets, we will treat the research laboratories and business producers as two wheels of the same cart.

I would also like to focus a good part of our efforts on environmental technologies in parallel with the R&D of service systems. At NTT, we are addressing environmental problems through two key approaches: Green of ICT and Green by ICT. Green of ICT signifies efforts to reduce the environmental load generated by NTT in the course of its business operations, while Green by ICT signifies efforts to reduce the environmental load in society enabled by the provision of NTT's information and communications technology (ICT) services. To date, NTT Laboratories has been involved with a number of environment-related themes and I would like to review these themes and reclassify them as either Green of ICT or Green by ICT. Then, for those themes that need to be developed further from a green perspective, I would like to actively promote the greening of them.



Leveraging diversity and creating new value

—Could you give us more specifics about the role of NTT Laboratories?

One key feature of NTT Laboratories is its research in a wide variety of fields. Its R&D mission is to pursue technologies that can be used today and technologies that can be used in the future—say ten years down the road—and to contribute to NTT business in diverse ways. In this way, it has been common to expect research results that exploit the features of each research laboratory. However, I believe that R&D has recently become a bit nearsighted, with researchers overemphasizing R&D that can produce short-term results and contribute to business. Planting the seeds of technological development, creating products, and supporting business are all important endeavors. For example, it has been thirty years since the seeds of optical fiber research were first planted, and the fruits of those seeds are the optical products and services you see now. Though there have been many twists and turns over the years—such as external pressure to accept that ADSL (asymmetric digital subscriber line) would be sufficient—we persevered with the conviction that we could achieve the ultimate in large-capacity communications and change society in the process. It was exactly this frame of mind that brought us to the present day. At NTT Laboratories, R&D target periods should be of various lengths and the R&D results should be of various kinds, but if we continue on our present course, I fear a lock-step mentality in R&D activities. It is for this reason that I would like to clarify individual roles at NTT Laboratories.

—High expectations are placed on producers that convert NTT research results into business. What are your thoughts in this regard?

The NTT Research and Development Planning Department includes producers that work to overcome the so-called *valley of death* [1] in technology development. There are high expectations especially for producers of service systems and producers of new businesses based on new devices. Service-systems producers work to enter new markets. They engage in *market-in* production activities that exploit R&D results to make the services provided by the NTT Group more competitive. On the other hand, new-business producers engage in *product-out* production activities that aim to create previously non-existent markets through the use of new devices.

The efforts made by producers are starting to yield fruit. Some examples are IPTV (Internet protocol television), digital cinema, and software as a service (SaaS). While researchers rate innovation by technical measures, customers evaluate the utility achieved by the technology. It is the role of the producer to connect the two. In the case of market-in activities, open innovation is extremely important. Since the producers and research laboratories have a common objective, it is crucial that they continually review and improve their execution plan through the exchange of information.



Open innovation and portfolio as important keywords

—You talked earlier about maximizing the total power of NTT Laboratories. How will you go about doing this?

I have two ideas in this regard. One is open innovation. Traditionally, an important element of maximizing activities at NTT Laboratories has been to concentrate on the strengths of each research group and researcher. But now, in the ICT era, it's becoming important to form links between various technology fields and markets. Unfortunately, there has been a tendency for R&D to still suffer from the *not invented here* syndrome. But I think that nowadays services in some fields are frequently being created by actively collaborating with outside parties and combining technologies that represent the respective strengths of each party. I believe that open innovation enables high-value services to be put on the market faster than usual for the customer's benefit.

My second idea is to make R&D themes into a portfolio. R&D consists of short- and medium-term themes, and since there is no other way than R&D to create new value, there is naturally a risk of failure. For NTT Laboratories to demonstrate its power in a sustainable manner, it is essential to achieve a good balance between short- and medium-term themes and between low-risk/low-return and high-risk/high-return themes.

Achieving such a balance in an individual or small organization is impossible, so it's important to carefully observe NTT Laboratories in total and build up a portfolio that covers the Laboratories as a whole. There have been many cases in the past of research being terminated, but once a certain type of research has been halted, it is extremely difficult to catch up if it is later found to be necessary after all. Making decisions simply on the basis of current information can be dangerous. The difficulty of taking a scrap-and-build approach while looking far into the future will always be with us.

NTT Laboratories' vital role in transforming NTT into a service creation business group

—There are high expectations for NTT Laboratories to create world-leading technologies and services, but this must present some difficulties.

Our wide variety of research themes implies a

broad range of materials and equipment, not to mention environmental problems across many fields. The research we conduct is also broad in scope: ranging from basic research to applied research. As a corporate research institution, we tend to focus on getting results out of the door as soon as possible, but I believe that we must also give sufficient attention to developing technologies that can bring about great changes in the future. The simple accumulation of yearly plans cannot produce much of an impact. It is imperative that we establish 5- and 10-year objectives and put ourselves on the path to meeting them.

Collaboration between the various research laboratories that deal in diverse research themes is also very important. Interaction between disparate fields can give rise to new value. By confronting problems from various viewpoints from materials to implementation, we can surmount high hurdles and generate variation. In this sense, a wide range of research fields is very significant.

We are a research institution of a major telecommunications carrier, and the first thing that we must keep in mind is how can we deliver services that are easy for our customers to use and how can we make the network easy to operate. For example, networks take a long time to construct in Japan. When deliberating the next design plan, we must determine the direction that technology will take in the years to come.

How can we achieve collaboration between related research fields with different project phases, between different research fields, and between the business and research sides? First and foremost, we must not bury our heads in the sand. The key is mutual dissemination of information among the various research laboratories to create new value.

NTT is leading the world in constructing fiber-to-the-home (FTTH) and NGN platforms. In addition to expanding these technologies overseas, I believe it is our mission to use these platforms to create high-value services for the good of society. We must play a part in solving the problems that affect society, such as environmental problems, problems generated by the aging society, and food-supply problems, and we



must provide safe-and-secure and easy-to-use services so that more people than ever will have access to the network.

— *Mr. Shinohara, could you leave us with a message for NTT researchers?*

Research is not an endeavor with a high batting average. It sometimes happens that the results you were expecting are never obtained. This is inevitable if high research targets are set. If a research failure does occur, it is important that you get that failure out into the open as soon as possible. Admitting to failure can be quite embarrassing, but doing so can be the first step in moving on. In addition, it is not constructive for higher ups to criticize such failures. At meetings, you must reveal failures so that everyone can learn from them and not only report things that are going smoothly. In short, I would like researchers to set high research goals and work toward them with great pride in their efforts.

Reference

- [1] N. Wada, "Vision for a New Optical Generation," NTT Technical Review, Vol. 1, No. 1, pp. 6–17, 2003.
<https://www.ntt-review.jp/archive/ntttechnical.php?contents=ntr200304006.pdf>

Interviewee profile

■ Career highlights

Hiromichi Shinohara received a master's degree from the Graduate School of Waseda University in 1978 and entered Nippon Telegraph and Telephone Public Corporation in the same year. He became a project manager in NTT Access Network Systems Laboratories in 1998 and the general manager of the Access Network Service Systems Laboratories of the NTT Information Sharing Laboratory Group in 2003. He became a director of the NTT Information Sharing Laboratory Group in 2007. He took up his present post in June 2009.