R&D Spirits

Connecting Seed Technology with User Needs through Open Source Systems

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NTT DATA INTELLILINK, a fully owned subsidiary of NTT DATA, uncovers and incubates next-generation seed technology in the rapidly evolving world of systems integration (SI). Today, in an era of one million subscribers to NTT's B-FLET'S broadband connection service, the forecast for network computing is unprecedented expansion in the years to come. Against this background, we talked to Kou Miyake, President and Chief Executive Officer of NTT DATA INTELLILINK, about the technologies that are now attracting attention in SI and the strategies being used to apply them.

R&D activities toward advanced SI technology

—Mr. Miyake, what is the work and mission of NTT DATA INTELLILINK?

NTT DATA INTELLILINK* is a fully owned subsidiary of NTT DATA, an NTT Group company doing business in the SI field. We are a systems technology company having extensive skills in open-source technology and products, and we partner NTT DATA on all of their projects designing and constructing system platforms. NTT DATA provides SI services tightly coupled with customer needs in the government, financial, and corporate sectors. In this kind of business model, knowledge of the SI business equates to core competence, but at the same time, there is an ongoing need to accumulate platform technologies and know-how on operating systems, databases, networks, and other system components. NTT DATA has been following this approach for some time, and in 1999, it established NTT DATA INTELLILINK to make its organization more flexible in these times of rapid technical innovation (**Fig. 1**). I myself came to this company from NTT Laboratories about a year and a half ago.

Our target is not current technology but technology that is one step ahead of the pack. Our business process, by the way, consists of an incubation phase and a business-profit phase. In the incubation phase, we receive seed technology and funding in the form of trial research from NTT DATA and the research laboratories of NTT (the group's holding company). At this time, we perform surveys, tests, trials, and development work and even train engineers in relation to that technology. In the business-profit phase, we connect seed technology with needs and engage in actual SI support, product sales, and consulting.

—What are your specific targets for technology development?

We currently have three main targets. The first is servers, where we are mainly dealing with Linux and Windows. In contrast to mainframes or UNIX systems that receive full vendor support, there is much in these operating systems that generates a need for SI know-how, and we are focusing lots of attention here.

* http://www.intellilink.co.jp/ (Japanese only)

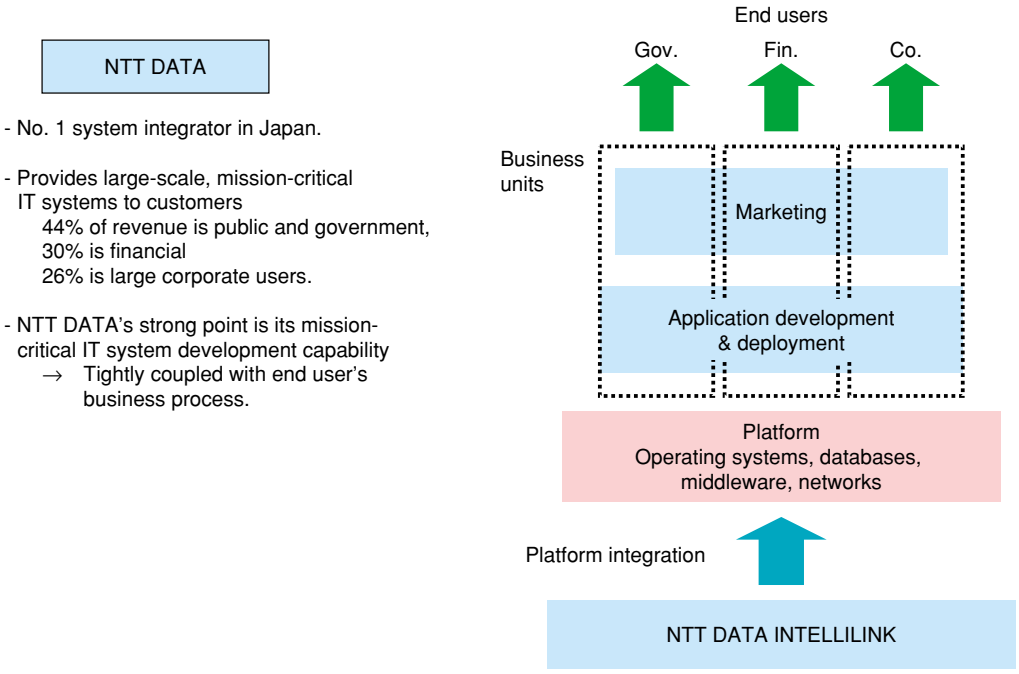

Fig. 1. Our mission.

The second is databases where we are using both open-source and vendor-supplied systems. We have recently been devoting much effort to PostgreSQL open source database software (**Fig. 2**). The third is networks, though not the wide-area type operated by communication carriers. Our emphasis is on closed networks of the corporate type where we are heavily involved with firewalls, gateways, load balancers, and the like. We are also involved in other areas such as package software for security management and reverse engineering for migrating mainframe-based systems to open systems.

—How do you view your present role at the company?

In short, I would say that my mission is to "put our company into orbit." This is our fifth year in operation, and while it's already been three years since we set up our current business system, our buildup of management resources especially in terms of personnel is still far from sufficient. For example, we had about 50 engineers when I came on board here, and that number has more than doubled to 108, but I want us to grow to a staff of 150 to 200 engineers over the next three years. Likewise, I would like to see our scale of business double as soon as possible. And though we are a fully owned subsidiary, I would like to become a self-contained company capable of expanding on our own. This is because a company that has not reached a certain scale cannot invest and cultivate staff as they see fit. In such a situation, motivation suffers and incentives dry up with the company falling into a negative spiral. To expand business, an infrastructure to that end must be constructed. I would also like to see the company expand its business to NTT Group companies besides the holding company as well as to companies outside the group, but for this we need a business division, which is not feasible at our present scale. Of course, profit is also one of our objectives, but to perform good work as all of us wish, we must create a more positive spiral.

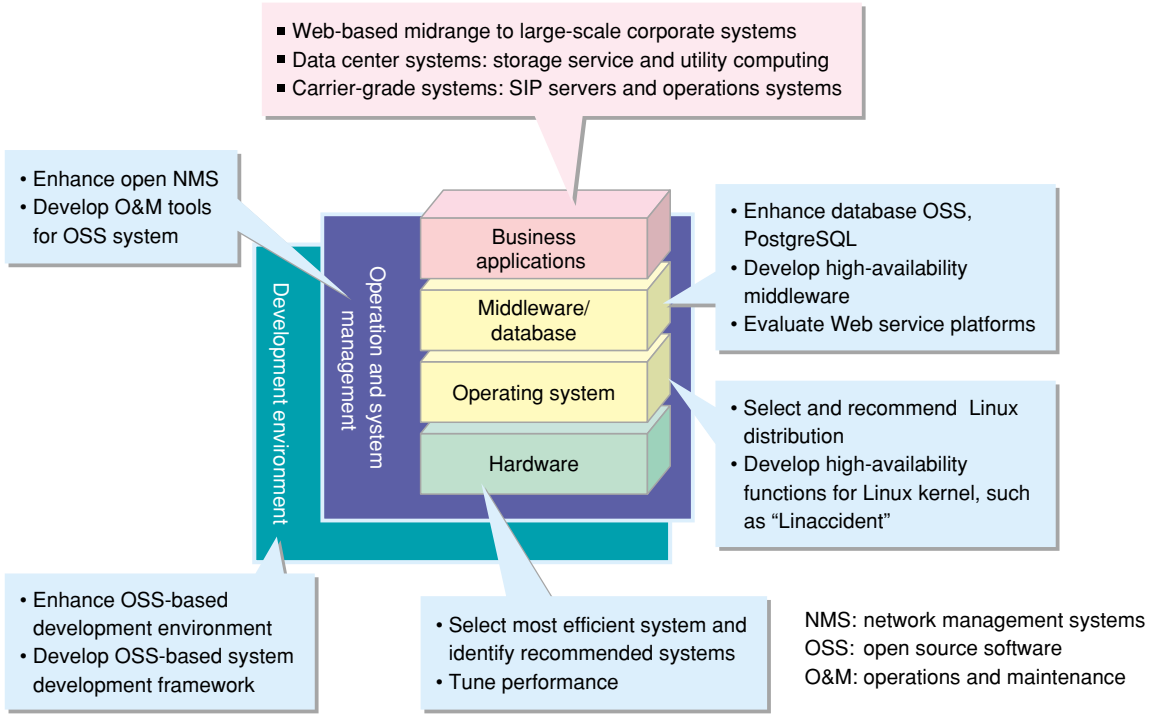

Fig. 2. Open source software development activities.

Developing key next-generation technology with a view to network computing

—What direction do you think IT is moving in?

I think that the overall trend in the IT business is toward network computing with ubiquitous computing being the ultimate vision. Above all, this will require the commoditization of basic software, and the best example I can give you of this, needless to say, is Linux. At present, Linux is finding widespread use on Web servers and Internet gateways, because of its ease of connection. That is to say, Linux, as open source software, is understood by a great number of engineers, and because Linux software connects over the network, it can provide feedback almost immediately whenever something happens. This kind of activity should increase all the more in the years to come. Naturally, this will require technology to facilitate the use of commoditized parts and to integrate them in new platforms. Of course, technology of this kind already exists, but it is geared toward a local network level of several thousand computers at most. In the true broadband era with several tens of millions of computers connected to the network and to each other, we can expect a network on a vastly greater scale.

—What is the company’s stance toward this trend?

Network computing requires a variety of technologies, and after we determine which will be necessary and how they should be used, we must then incubate them. And while this is a time-consuming hit-and-miss process, I would like to uncover those key technologies with as few misses as possible. To this end, we set up an open-source technology section in November last year. This kind of work, however, is not easy to do on our own, and we are working close-

ly with outside groups including NTT DATA and NTT Laboratories.

—Could you give us some examples of collaboration with other companies or NTT Laboratories?

Yes. One example is our linkup with NTT Laboratories in the development of home gateway technology. At present, the user side is responsible for making all the settings on an Internet home gateway, and while this may be acceptable if limited to initial settings, it can be very bothersome if updates have to be made frequently. Moreover, the occurrence of a major problem is apt to frustrate users to no end. Our answer to this is a "plug-and-play" approach whereby the user simply connects the home gateway to a personal computer as a peripheral device and lets the network side take care of everything via automatic downloads and checks. We are working with NTT Laboratories to construct prototypes devices toward practical application of this mechanism.

We also treat databasing as a key technology of the future. As you know, it is now becoming possible to digitize, store, and retrieve all kinds of information related to life from documents and music to pictures and video. But satisfying this need for business purposes will require technology on a much larger scale. We are working with the Open Source Development Center (OSDC) recently established within NTT DATA and with NTT Laboratories to develop database technology centered on PostgreSQL open source software. Moreover, in relation to Linux, we are collaborating with the inter-group open source support center established at NTT Laboratories.

—Are you linking up with any overseas groups or engaged in any international activities?

Well, as for international activities, we became a member of Open Source Development Labs (OSDL), a non-profit organization in the United States, last summer. The role of OSDL, which is home to Linus Torvalds, the creator of Linux, is to connect enterprise with the development community. We are also working with affiliated companies of NTT DATA and many other vendors to collect information on technology trends in North America and research newly developed products.

At the same time, we are linking up with India and China in the form of offshore software development. In particular, we expect our future relationship with China to be a close one, and for this reason, we are exploring collaboration on platform technology in addition to such offshore development.

From theoretical research to application and the business front line

—Mr. Miyake, what kind of R&D have you been involved in up to now?

To be quite honest, the fields that I worked in before coming here had practically no relation to SI. My first assignment after entering NTT Laboratories in 1980 was to research configuration methods for digital communication networks and traffic theory in the trunk-switching research division. I worked on that for six to seven years. Then, I got involved in more practical topics including system design of high-speed packet switching equipment.

Next, from around 1990, I worked on the construction of prototype ATM switches as part of ATM switch development, which was extremely active at that time. This marked the first time that I became involved in genuine application work and I was in charge of ATM system design over three generations. Nearly 2000 units of the ATM systems that I designed were deployed in Japan in the 1990s. In the mid-nineties, I also helped support new common carrier (NCC) business that was expanding in Malaysia and Singapore as part of NTT's internationalization strategy. And from 1992 to 1997, I participated in ITU standardization activities in relation to ATM. After that, I did some work on developing network systems for full-scale deployment of VoIP, a current field of interest, and then came to NTT DATA INTELLILINK last year.

—What aspects of your present work do you find interesting?

To be frank, SI is not a world that I am very famil-

iar with. But my nature is to look at things from a positive perspective, and I enjoy learning about new fields. For example, I met and interacted with many American venture entrepreneurs over the years and found what they had to say extremely interesting. In addition to information on technology development, I learned much about creating business plans and how to obtain venture capital. Although our company is somewhat different from a true venture, I think we are lucky to have this opportunity of running an actual business.

—What would you like to do in the years to come?

I would like to find technology born in NTT DATA, NTT Laboratories, or other research institutions that might wither away if simply left alone and bring that technology to NTT DATA INTELLILINK for careful cultivation so that it blossoms. To that end, I make the rounds of research laboratories searching for such seed technology. But finding such seeds is not the only challenge. What is difficult is receiving the funding necessary for incubating those seeds. And even if such seed technology can be further developed, it will not blossom if it has no business potential. Since our company is run by engineers including myself, its core competence is technological expertise. But I have recently become keenly aware that engineers from here on must be more than just technically competent. I would like to see engineers with a good eye for technology also incorporate a good sense of business so that they can connect seed technology with real-world needs. That is my personal theme at the moment.

Future issues: creating a venture-type organization and developing staff

—As an engineer and business manager, how would you like to develop the company itself?

As a company of engineers with a venture orientation, we must be a continuous source of technical innovation. In the IT world, repeating the same thing will lead to absolute failure. We must keep a continuous watch on technology trends and keep trying out new things. Sometimes, it is necessary to withdraw from a project. My goal is to promote a mindset of sustainable development with a sense of flexibility to a changing environment based on an insatiable spirit of inquiry toward technology.

I would then like to expand our staff while improving their individual skills with the aim of forming a special group of engineers. At present, the complexity of information systems requires a division of labor in engineering work. As a result, there are not many engineers who not only design but also program and supervise or plan and manage a business operation. But to adapt quickly to new situations at the forefront, as our company must do, we need a staff that can work as a self-contained organization. My aim is to cultivate engineers who can handle all of the processes required in research and development.

—What is your vision of the future as a researcher and developer?

The first ten years of my R&D life were spent on theoretical research. Looking back, I think of that time as a kind of halfway point. Then, over the next ten years when I was involved in practical applications, I saw many research results finally take form. And now, as I move into management, I'm helping to build bridges between R&D and business. Looking back, there's no doubt that I have been involved in various kinds of work, but I feel that I have made good progress and have arrived at a good point.

But to tell the truth, at one time I expected that I would spend the final ten years of my working life in a university research laboratory. While business can be extremely interesting, I would have to say, if given a choice, that research suits my personality more than management. Since I don't dislike teaching at all, I really thought that I would be spending the last part of my R&D life in a university. However, present circumstances prevent me from spending my "remaining years" in that way.

—What was it like working at NTT Laboratories?

NTT Laboratories is the place that gave me my R&D foundation, and I spent more than 20 years

there growing as a researcher and developer. I cannot deny that I have a deep affection for NTT Laboratories where so many superb researchers work. But since leaving there, I have come to think that it might do well to become a more open organization. In addition, perhaps because of its large size, NTT Laboratories seems to feel no sense of crisis, despite the fact that research laboratories around the world are disappearing. I think there is a need to take a longer look at the surrounding world and make some changes in the way things are done. I began to think like this during the last year and a half when my exposure to the business world brought about a major change in consciousness in me. While I had previously sought to understand things with only my head, first-hand experience shed a whole new light on reality.

—Finally, could you give us a message for young researchers?

I would be happy to. From here on, researchers and developers will need to do more than just devote themselves to the technical aspects of their work. To spread the fruits of your research into the world, you will have to keep a keen eye on the outside world and develop agility and flexibility in the face of unexpected changes. You must also learn to think, investigate, and act on your own. Instead of waiting for something to be given to you, you should find out what it is that has to be done and then devote your energies to that end. That's the kind of mind that I would like young researchers and developers to have.

Interviewee profile

■ Career highlights

Kou Miyake received the M.A. degree in mathematics and the D.E. degree from Tohoku University, Sendai, Miyagi in 1980 and 1991, respectively. He entered Nippon Telegraph and Telephone Public Corporation (now NTT) in 1980. In 1989, he became a manager at the Network Systems Development Center. He moved to the Communication Switching Laboratories as a Senior Research Engineer in 1991 and became a Senior Research Engineer, Supervisor there in 1992. He moved to NTT Network Service Systems Laboratories as a Senior Research Engineer, Supervisor in 1994. In 2001, he moved to NTT Service Integration Laboratories. In 2003, he moved to NTT DATA as a Senior Manager in the Systems Technology Business, IT Business Development Sector. He became Executive Vice President of NTT DATA INTELLILINK in 2003 and the same year he became its President and Chief Executive Officer.