

## NEC Innovation Day Q&A

Date/Time: December 17, 2021 13:00-14:00 JST  
Location: Tamagawa Office and live audio streamed  
Presenters: Motoo Nishihara, Executive Vice President, CTO (Chief Technology Officer)  
and Member of the Board  
Akio Yamada, Senior Vice President  
Teruyuki Nakajima, Senior Vice President  
Masamitsu Kitase, Corporate Executive

### **Questioner A**

Q:

*In this briefing, you presented a variety of measures spanning the whole spectrum of R&D. As far as your plans for commercialization are concerned, which part of this spectrum are you focusing on? For example, NEC has already deployed facial authentication and it has already discussed certain future projects for 2030. Could you please tell us which part of the spectrum you are focusing on for commercialization?*

A:

Carbon neutrality is a sustained, long-term trend, so there will be short to long-term timelines. Some things need to be done in 3-5 years, while other things must be done sooner. I believe quantum technologies will take a little longer to grow into large businesses.

For the other technologies that we have presented today, we have narrowed the target to solutions we will realize during our mid-term management plan through 2025 or from 2025 to 2030. The technologies unveiled today, except for quantum and carbon neutrality technologies, will be advanced in close coordination with the mid-term management plan.

Q:

*What share of the overall technology portfolio will projects that can be commercialized in the next 3 to 5 years represent?*

A:

It is very difficult to discuss these matters in quantitative terms. Roughly speaking, in around 2 years, we expect around 20% of the technology portfolio to be used in businesses that we already foresee. In 3 years or more, we expect the remaining technology portfolio to be used. The longest timelines for putting technologies into use include time spans of around 10 years, as is the case with quantum technologies. However, there are very few of these kinds of technologies.

Q:

*Around how many companies will be covered by the NEC Orchestrating Future Fund, which was unveiled today? It looks like the fund will cover a wide range of areas. In which areas will the ¥17.0 billion be allocated, and how much will be allocated to each area? What kinds of targets have you set for the recovery of these investments?*

A:

The number of companies is expected to be around 5 to 10 companies, and the basic assumption is that the fund will be covering 1 company per business domain. We will decide on the portfolio allocation for short- and long-term investments, and we will allocate funds to the six areas shown on the presentation slide. Currently, we are in the midst of determining the specific details, so we will finalize and then implement our investment strategies.

**Questioner B**

Q:

*My question concerns the R&D cycle. How does NEC determine what kinds of research it will start? Also, how does NEC manage the yield as it proceeds with development thereafter?*

A:

Our basic approach is to determine the overall direction on a top-down basis and then determine research themes by breaking down the overall direction into smaller pieces. However, this approach alone does not allow us to adequately address unexpected changes and other developments, so I have instructed researchers to allocate 20% of their time to setting and working on individual themes that are different from their assigned themes. Sometimes their individual themes are extracted to be the assigned themes. Looking at yields, we manage yields for themes that have passed beyond the initial stage. However, we don't strictly manage yields for themes in the initial stage of R&D, because if we manage them too strictly, this can make it difficult for researchers to tackle ambitious themes.

Q:

*Do you have any KPIs that measure how many successful projects are produced on an annual basis by, say, 1,000 researchers as a result of spending 20% of their time on such projects?*

A:

We have KPIs, but not the kind that measure how many successful projects were produced with so-and-so many people. R&D depends heavily on people, so the most important determinant of success is how well you can secure talented personnel. I also believe trial-and-error processes are at work in each team. Therefore, R&D is not managed simply in terms of the success rate. We seek to build good teams and aim for each team to deliver a significant success at least once every 3 years.

Moreover, the Global Innovation Unit is comprised of not only R&D team members but also

new business development team members. These new business development team members have defined the steps leading from the birth of a technology to a new business and have built a framework for examining each of those steps. Rather than managing yield only within the scope of the research laboratories, yield is managed within the larger context of all the processes leading up to commercialization.

Q:

*In the process of shifting from development to commercialization, I've heard that in some cases Japanese companies lack the resolve needed to stop a project that has already been started, and this pushes up costs. Has NEC set criteria for stopping projects?*

A:

Projects are quantitatively evaluated using techniques often employed by venture capitalists for estimating the approximate business value of a project if it succeeds in its projected market, on a cumulative basis, while modifying those techniques for internal use. As you point out, it is very difficult to decide to stop a project once it has been started. However, we know all too well that new businesses will not succeed unless we make this decision. For this reason, we have managed projects strictly, especially over the past few years.

Q:

*Does this mean that you will stop a project if you determine that it would be difficult to recover your investment based on projected future earnings?*

A:

At the basic research stage, we cannot foresee how the value of a project might emerge. That is why, for example, we may limit the initial fund allocation to around 20% of the cost. The remaining portion will then be allocated as business-focused activities are carried out within the timelines of the mid-term management plan or 2030.

In new business development, we define the phases of progress and always conduct a gate screening when a project advances to the next phase. Progress is checked against the activities and results that should be completed in each phase. The more a project advances through the phases, the more the project can use resources such as personnel and funds. Naturally, new business development does not have a 100% rate of success, so we will discontinue businesses that cannot generate value as expected. Another important point is that we have set an upper limit on how long a project may remain in the same phase. In this way, project management is carried out to ensure that projects are not permitted to remain in a state of stagnation.

Q:

*Are projects managed so that losses are tolerated initially but only up to 2 years, according to the growth stage of the business?*

A:

Activities to create new businesses from scratch are initially unprofitable in almost all cases. If profitability is pursued at any cost, the potential of the business will be crushed. Therefore, at least in the investment phase, we continue to make the necessary investments from the perspective of maximizing the final form of the business.

For example, in the healthcare area, we have set an upper limit on the cumulative amount of investment available until progress to the next stage is achieved. We verify whether a project has surpassed a certain threshold in terms of the investment multiple and IRR, relative to its business concept and hypothesis. If performance is below this threshold, we will decide whether or not to continue the project. If we decide to discontinue the project, we will make judgments about the project such as whether it is worth continuing outside the company, how far the assets we have invested in can be used effectively, and the possibility of divesting the business to outside parties.

#### **Questioner C**

Q:

*Could you please once again explain the aims of NEC X? NEC has made progress on spin-out projects. I believe that NEC has gathered businesses that should not be developed to the very end internally, but that may be interesting if they are spun out of the company. However, it is difficult to foresee how NEC will ultimately derive profits through NEC X. In the case of dotData, I felt that it became an equity-method affiliate in a very short space of time. What sorts of principles are the basis for your activities, and what kinds of endpoints are you targeting? For example, we might assume that NEC will be able to generate profits by holding exclusive marketing rights as dotData's sole agent in Japan. Conversely, would this be all that NEC can be expected to accomplish?*

A:

I'd like to address two points. The first point is, as you pointed out, that NEC may develop projects that have technological value, but due to limitations on NEC's business portfolio, can be monetized more effectively by spinning them out from the company. Our approach is to spin out these types of projects from the company.

The second point is there are areas that could eventually become NEC's core technologies, such as dotData, and that also require speed. Even if core algorithms alone can be established, that does not necessarily mean they will become products. Projects that can grow more easily by attracting personnel and in some cases funding from other parties, will be spun out from the company.

dotData fits into the latter pattern. That is why products were developed at an early stage, and there is a possibility of obtaining capital gains and financial returns too. In addition, the process of linking NEC's various assets and creating new solutions puts a large burden on NEC's product divisions. Therefore, it is crucial for different teams that have an in-depth understanding of customers to build up solutions. In the case of dotData, a new organization named the Data Driven DX Division has been carrying out this task. The reality is that we are conducting both these approaches.

The advantages of Silicon Valley are that it is easy to attract information on matters such as insights into how technologies will be used in the future and applications, and investment funds flow into the region from outside. I talked about the fact that we have created a channel of 5,000 venture capitalists and a channel of 1,700 management leaders. These individuals also possess information about the market. In this sense, we believe that Silicon Valley is an appropriate place to foster the growth of solutions. These activities come down to maximizing business while thoroughly leveraging the Silicon Valley ecosystem.

If we seek to ultimately deliver maximum returns to society through the technologies held by NEC, then, for example, rather than retaining a business internally as the owner and developing it into a ¥1.0 billion business, it would be better for NEC to instead hold a 10% interest in the business in return for making it 10 times larger than the ¥1.0 billion business. Based on this reasoning, we want to try to implement the technique of attracting external funds.

Q:

*How are the research laboratories approaching the European companies acquired by NEC? For example, I believe that KMD is a company engaged in areas capable of cross-selling in Japan. However, you don't hear very much news about the expansion of KMD's technologies in Japan. Are the research laboratories taking the lead in conducting collaboration and other activities? What are your plans for such activities in the future?*

A:

We had already discussed synergies with the European companies at the time that we acquired them. There are synergies in both directions. Sometimes the assets of the acquired companies can also be used in NEC's business domains. Conversely, NEC's technologies and channels can sometimes find uses at the acquired companies.

We had interacted with KMD and Avaloq before the acquisitions by, for example, holding technology presentations. The researchers of NEC Laboratories Europe, which is located in Germany; the Israel Research Center; and our research laboratories in Japan and North America held discussions with the acquired companies at the CTO level. They discussed how NEC's technologies could be incorporated into future solutions, and what they could accomplish by doing so, among related matters. Projects have actually been initiated. If we are able to generate these kinds of synergies, we believe that we can also apply these

solutions to different markets in the future.

Notably, Europe is ahead of the rest of world in many different areas, such as carbon neutrality. Therefore, we anticipate that the best solutions developed in the European market can be harnessed effectively in other areas, markets and regions. When conducting the acquisitions, we also learned that the deals were reached because NEC has attractive technologies in the eyes of our acquisition partners. Accordingly, we believe that our research laboratories have played a pivotal role in this process.

The research laboratories are engaged in regular communication with the acquired companies. Plans are also under way to develop future product proposals of the acquired companies based on the technologies of the research divisions. For example, KMD is a company that is strong in the digital government area. When considering ideas for future business from a Company-wide perspective, we come up with research themes based on the market intelligence that KMD possesses and its pipeline for gathering information on customer needs. We intend to apply these research themes in Japan and elsewhere. In this manner, NEC and its acquisition partners are sharing and utilizing their capabilities in both directions.

#### **Questioner D**

Q:

*I'd like to ask a question about human resources. I believe that NEC is working positively to ensure retention, such as removing the upper limit on remuneration. Meanwhile, I also believe that NEC and other companies are scrambling for the most highly skilled personnel. Do you feel that NEC's competitiveness has increased in terms of personnel retention and recruitment, in comparison with a few years ago? Also, could you please share any differences in areas such as personnel retention between Japan and North America?*

A:

We have confidence that NEC is increasingly competitive, and the number of personnel who have stayed at NEC and worked for us has been increasing. I believe that the 20 members of the Selective Compensation Program for Professional Researchers have been approached in many ways from the outside, but they have still stayed with NEC, worked here and produced results. Several of our individual exhibits include those put on display by these researchers. I'm very thankful for their efforts.

I believe that it is highly effective to decide on remuneration according to ability and performance, regardless of the year personnel join the Company or background. This principle is the same internationally. However, living standards vary with each area, so we need to consider whether workers can have the same standard of living with the same salary. There is also an average remuneration level for each occupation, so we need to consider this point as well. For these reasons, the salary structures differ slightly in North America and Europe. Meanwhile, I believe that the environment we provide to personnel is also important, not just

salaries. For example, our North American research hub is located in Princeton, New Jersey, which is a very popular town. It is crucial to consider whether workers will like the environment around the workplace when they consider factors including the needs of their family members.

Another consideration is the assignment of themes that researchers work on. When people are young and are in their prime growth years, they want to tackle ambitious initiatives that allow them to fully demonstrate their abilities. Therefore, it is critical to provide opportunities that fit their targets. That said, if we provide them with opportunities blindly, that may not always align with the Company's direction, so we need to make sure that the opportunities match the Company's future course. In these ways, we need to care for the non-financial aspects of their work that are not related to pay. I believe it is important to determine how to nurture and care for talent.

A:

We have produced highly significant results. Today, we have prepared several demonstrations. Looking back over the past few years, the fact is that numerous first-rate accomplishments have been generated from the ideas of personnel that receive this kind of remuneration for researchers. While the outflow of personnel was originally never very high, it is true that in the past people would sometimes leave our workforce to join startups. There is no doubt that the number of such people has decreased. This number might have decreased because of remuneration factors, or perhaps because workplaces have become more attractive than before due to an increase in opportunities to pursue projects through to final commercialization. Alternatively, the 20% rule of allowing researchers to devote 20% of their time to innovative projects they are interested in might have played a part. In the research and academic community, NEC is known as a place where researchers are permitted to pursue freely what they want to do. I can't give you a definitive answer, but I think a mixture of these factors are involved. Although the systems are different, the same is true abroad. Notably, North America is a market with fierce headhunting. However, the outflow of personnel has stopped and the number of personnel working at NEC has increased since we set up NEC X.

Researchers abroad have a strong desire to produce results that have a positive impact on society. I believe that it is a very good idea to increase the breadth and variety of endpoints for their research accomplishments.