Q&A at R&D Presentation

Date/Time: December 9, 2014 16:00-18:15 JST

Location: NEC Headquarters, Tokyo

Presenter: Katsumi Emura, Senior Vice President

Questioner A

Q. How does the company evaluate return on investment for R&D expenses?

A. Since approximately 40% of R%D spending for the Central Research Laboratories is funded by business units, our activities at the laboratories are evaluated by business units in charge. The rest of the spending comes from corporate funding.

Questioner B

Q. Do we expect to see an increase in R&D spending and expanded activities going forward? Does R&D spending increase as the company performance improves?

A. R&D to sales ratio at NEC remains at 5% over the past few years. We invest in areas of our strengths while accelerating open innovation activities for better efficiency.

Q. How do the laboratories narrow down research subjects and themes? Is there uniqueness in NEC's research activities?

A. We believe that it is important to focus on areas of our strengths. NEC has had a long history in communication business and our strengths lies in network technologies. For example, NEC is focusing on SDN technology which is anticipated to change the paradigm of network systems. Furthermore, in data science, we focus on technologies such as invariant analyzer and heterogeneous mixture learning to strengthen our prominent solutions. We also have world-leading technology in face recognition and strength in security technologies including cyber security.

Questioner C

Q. In the presentation, the company introduced 4 kinds of technologies—invariant analyzer, heterogeneous mixture learning, textual entailment recognition and face recognition—as its propriety technologies. These technologies were introduced first over three years ago by the company as its strong technologies. What progressed since then?

A. We can categorize invariant analyzer, heterogeneous mixture learning and textual entailment recognition as part of data analysis technologies. The technologies to enhance data analysis has become more sophisticated over the past three years, but the notable progress we made stems in knowledge that we gained from working with customers like The Chugoku Electric Power Co., Inc. We gained invaluable knowledge in plant management while applying invariant analyzer to their power plants.

Q. What kind of businesses do we expect to see using these 4 technologies?

A. There are many business patterns that these 4 technologies may be applied to and moreover, business patterns change as new applications are introduced. For example, textual entailment recognition technology is evolving in respond to changes in finance industry. In commercializing plant monitoring solution using invariant analyzer, additional functions may be required to respond to a wider range of subjects in monitor. In face recognition, the subject is changing from a still, front view image to a movie. These changes result in new applications and hence an advancement in technologies.

Q. In face recognition, what triggered a change in subject from a still image to a movie? Is it hardware that enabled such progress?

A. There certainly was advancement in hardware technologies, as well as development of more sophisticated algorism that respond to changes in applications.

Questioner D

Q. Touching on the subject of open innovation, does the company invest in ventures with good technologies? In partnering with other companies, how does NEC protect intellectual properties and patents? How does the company recruit new researcher? What kinds of background in a recruited researcher does NEC look for? When considering research costs and risks, how do the laboratories decide on which project to terminate and when?

A. NEC has been investing in venture companies. In R&D, we assign some researchers at the laboratories to visit venture companies around the globe to evaluate and recruit promising technologies to strengthen our portfolio. We are working to strengthen open innovation activities.

When considering intellectual properties and patent strategy, all properties that may work in advantage of our business are patented. However, the real challenge is how these patents actually contribute to business expansion.

In researchers, we look for diversity. We currently look for students and researchers limited not only to electrical and electronic engineering and IT information areas. Moreover, we look for wide educational backgrounds in a researcher, such as those with double majors or different majors in undergraduate and graduate studies.

In deciding which projects to continue and which ones to terminate, there are two different approaches. In data science, we work on trials in specific themes for customers. In this process, we evaluate whether the outcome is on track with customer expectation to minimize risks. In platform, we continue to reinforce the technologies that play the role as a foundation to NEC’s competitive edge.