

## Innovation Management

Technologies in demand change as society changes. However, NEC seeks to provide technologies that create social value by conducting management with an appropriate grasp of the changing times. Under the direction of our Chief Technology Officer (CTO), we have formulated a technology strategy for the next stage of growth in social value innovation. We continuously allocate approximately 4% of our revenue to R&D, concentrating our investment in proprietary No.1/Only 1 core technologies.

Moreover, we regard intellectual property as an essential business resource supporting the NEC Group's competitiveness and stability, as well as for contributing to co-creation with our customers. We constantly strive to strengthen and protect our rights.

In addition, we will actively promote commercialization of technologies across our conventional business framework and global open innovation, working to accelerate monetization of competitive technologies.

### Concentrated Investment in Strong Technology Areas

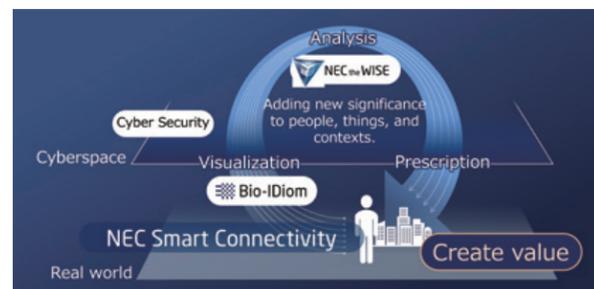
We are concentrating investment in two areas where we have many unique and competitive assets: data science, and ICT platforms.

In the area of data science, we are developing AI technologies that contribute to the creation of new value by carrying out visualization, analysis, and control/guidance of real-world data. In the area of ICT platforms, we are developing computing and network technologies that can adapt dynamically and in real-time to changes in the real world, and security technologies that allow social systems to operate securely and stably.

As part of these efforts, we are strengthening our "NEC the WISE"

line up of advanced IT technologies and our comprehensive brand for biometric products and services, "Bio-IDiom," which covers six biometrics technologies for face, iris, fingerprint and palmprint, finger vein, voice, and ear acoustic.

In April 2019, we established a new brand, "NEC Smart Connectivity," that leverages NEC's strengths in network technologies. In addition to technologies for visualization, analysis and control/guidance of the real world, networks that connect a large volume of data will also play a significant role in providing value to customers going forward.



### Enhancing Diversity and Developing Human Resources to Strengthen Core Technologies

We are working toward enhancing diversity and concentrating our human resources in our key business areas in order to strengthen the core technologies that contribute to solutions for society, as well as to sustain our technological capabilities.

Specifically, we have been expanding our human resources under a policy of increasing the number of data science researchers at the Central Research Laboratories to double the number in fiscal 2016. Our overseas research laboratories are

actively recruiting top local talent while our research labs in Japan are stepping up recruitment of doctoral degree holders. In fiscal 2020, we are continuing with our policy of hiring applicants with PhDs at around 50% of new hires, and will be recruiting more graduates from overseas universities such as the Indian Institute of Technology and other notable institutions. As a result of these policies, 30-40% of our new recruits are now classified as "global human resources."

### Major Research Achievements

NEC's Strengths	Result	Client/Application
Logical thinking AI	Developed AI technology to support stable operation of social infrastructure	Social infrastructure such as plants
Time-series data model free analysis technology	Developed status recognition technology through AI-driven time-series data analysis, aiming for application in the operational monitoring of social infrastructure	Social infrastructure such as plants
Two-dimensional small displacement analysis technology	Developed two-dimensional small displacement measurement technology that enables satellite radar to inspect aging roads, buildings and infrastructure in urban areas	Infrastructure such as roads and buildings
Tamper detection technology	Developed 4-kilobyte tamper detection technology applicable to IoT devices in plants	IoT devices
Automatic cyberattack risk identification technology	Developed technology for automatically identifying cyberattack risk of systems using simulations	Plants
High-speed camera object recognition technology	Developed high-speed-camera object recognition technology contributing to efficient inspection operations on production lines	Production lines
Rare event discovery technology	Developed efficient technology for discovery of rare critical events by merging AI and simulation technologies	Product quality and safety, infrastructure operations, etc.
Stress detection technology	Development of technology that enables early detection of increase in chronic stress of employees from physiological information	Employee health management, etc.
Person reidentification technology	Developed technology that is capable of matching images of people whose figures are partially hidden from cameras, even if the image is taken from behind or from the side	Public safety and security
Local expertise in India and big data technology	Started development of solutions for emerging countries and R&D in India	Transport, logistics, public safety, digital government, cashless payment

### Intellectual Property Strategy

NEC strives to strengthen and protect not only its patents and knowhow but also the designs and trademarks that support its global brand.

To create and develop social value, we are not only building IP-based barriers to entry and securing competitive advantage, but

also building and using our IP portfolio to strengthen and protect collaborations with customers and partners.

NEC owns some 49,000 patents worldwide (including approximately 22,000 Japanese patents) as of March 2019.

### Accelerating New Business Development

In July 2018, NEC announced the establishment of a new company, NEC X, Inc., in Silicon Valley, U.S.A. NEC X aims to create an ecosystem centered on the advanced technologies of NEC's talent and research laboratories and to promote co-creation of

solutions involving Silicon Valley entrepreneurs and venture capital firms. As part of its mission, it has started the NEC Accelerator Program, which will start up new businesses in as little as one year, aiming to accelerate new business development.

For further information, please refer to Sustainability Report 2019 "Innovation Management."