Innovation: R&D / Business Development / Intellectual Property

NEC's Technological Capabilities

NEC regards the technological capabilities and intellectual property (IP) it has cultivated through decades of R&D as key sources of competitiveness, driving the advancement of existing businesses and the creation of new businesses. The Company has identified AI, security, and the platform technologies that support them as focus areas. By integrating R&D, business development, and the provision of products and services while responding to changes in the market environment, NEC strives to deliver value rapidly.

NEC already possesses globally recognized technological capabilities in these fields, including one of the world's highest numbers of patents held and papers accepted by leading international academic conferences, as well as multiple No. 1 rankings in global benchmark tests for face recognition technology.[1] Going forward, NEC will continue to maintain a certain level of R&D investment from a medium- to long-term perspective regardless of economic conditions, strengthening the technological capabilities that underpin future social value creation while working to generate new value. Building on these strengths, NEC will promote its transformation to an AI-native company and expand NEC BluStellar, its value creation model, as set forth in Mid-term Management Plan 2030.

AI (including biometrics)	Machine learning: The number of papers accepted at leading international conferences[2]: **Ranked 11th in the world**
	Video and image processing: The number of papers accepted at leading international conferences[3]: **Ranked 1st in Japan**
Security	**45 papers**[4] accepted at leading international conferences
Platform technologies	Optical communication: Papers accepted at leading conferences[5] for **48th consecutive year**
	4 papers published in the scientific journal *Nature* in the field of optical computing
Patents	Top 100 Global Innovators global survey of patent activities[6]: **Selected for 15 consecutive years**
	Biometric authentication, video recognition, and analysis/prescription AI: Number of accumulative international patent applications[7]: **No. 1 in the world**

Developing People and Environments to Drive Innovation

Creating innovation requires human resources with diverse expertise and an environment that enables them to maximize their potential. By leveraging the strengths and expertise across its global R&D locations, NEC has established a global R&D framework, and approximately 40% of its researchers are global specialists.

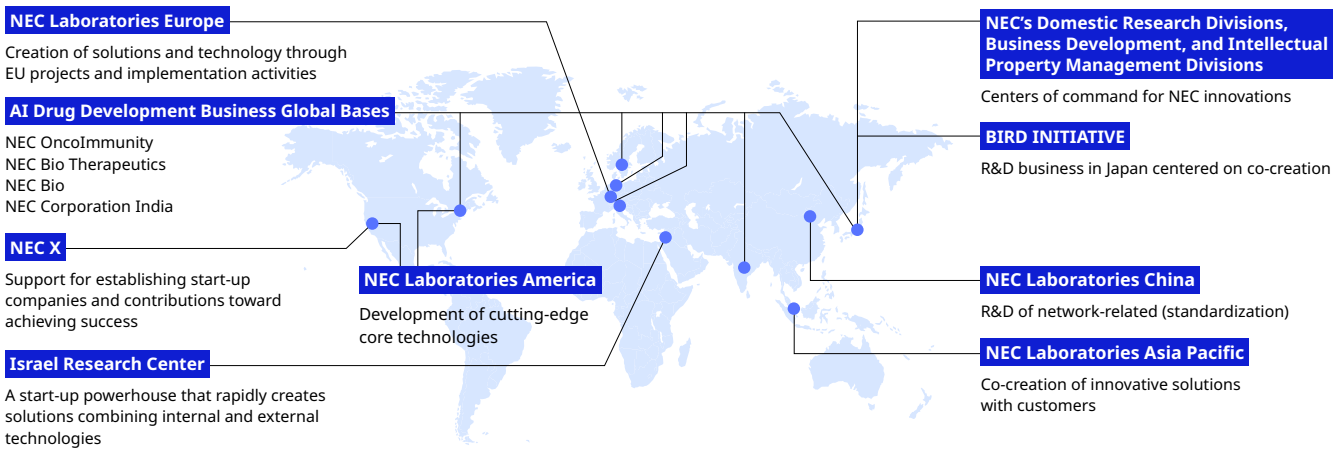
To translate innovation into social value and apply it in the real world, it is also essential to have personnel who specialize in new business development and IP. We are working to strengthen and expand our specialized talent base through external recruitment and internal training, while promoting closer collaboration among R&D, IP, and new business development functions.

Furthermore, NEC strives to create an environment in which outstanding talent can reach their full potential. NEC X, Inc., which operates from Silicon Valley, promotes open innovation by leveraging NEC's talent and technologies in collaboration with the local ecosystem, aiming to create new businesses that have an impact on society. BIRD INITIATIVE, Inc., a co-creative R&D joint venture with seven companies from different industries, a corporate venture capital fund, business competitions, and a newly launched start-up studio in Japan bring together diverse expertise from both inside and outside the Company to create new value.

Details on talent acquisition and development for driving innovation are provided in the Human Resource Development Programs section of NEC ESG Databook 2026.

1 Ranked No. 1 multiple times in face recognition benchmark testing held by the U.S. National Institute of Standards and Technology (NIST)
https://www.nec.com/en/global/solutions/biometrics/evaluation/index.html
Note: NIST testing results do not constitute an endorsement by the U.S. government of any particular system, product, service, or company.
2 NeurIPS, ICML, ECML-PKDD, KDD, ICDM.
3 CVPR, ICCV, ECCV, ACCV, ICPR.
4 Security: ACM CCS, IEEE S&P, Euro S&P, USENIX Security, Crypto, Eurocrypt, Asiacrypt, TCHES, FSE (2015–2024 results)
5 Communication: OFC/ECOC and others (as of December 2025)
6 Top 100 Global Innovators:
https://www.nec.com/en/global/intellectual-property/topics/260122.html
7 Source: Patent Cooperation Treaty (PCT) data, as of October 2025 (NEC research)

Leveraging Global Strengths to Increase R&D and Business Development Opportunities



1. R&D Capabilities Geared Toward Creating New Value to Meet Social and Customer Needs

NEC is creating new value for society and customers by strengthening technologies in AI, security, and the platforms that support them, which it has identified as its priority technology domains.

In the field of AI, NEC is promoting R&D on AI agents that enable the autonomous execution and optimization of tasks to address social challenges such as labor shortages, increasing operational complexity, and the need for greater productivity. NEC is also establishing advanced governance technologies to ensure the reliability, safety, and ethical integrity of AI, thereby promoting a society in which humans and AI can work collaboratively.

In the security domain, NEC is developing technologies that support highly effective security operations tailored to the risk characteristics of different industries through AI-powered threat analysis and advanced intelligence capabilities, addressing increasingly sophisticated cyberattacks. NEC is also contributing to the trustworthiness of the digital society and the sound development of information infrastructure through the development of technologies to address the risks associated with advanced information manipulation.

In the field of platforms, NEC is working to build and maintain more reliable and secure social infrastructure through research and development in both submarine cable system technologies and secure network technologies such as quantum cryptographic communications, whose importance continues to grow from the perspective of economic security.

NEC also applies these cutting-edge technologies through its "Client Zero" approach, under which the Company serves as its own first customer and builds up practical knowledge through in-house implementation and use. The insights gained through these efforts are incorporated into the products and services of NEC BluStellar, the value creation model that leads our customers to the future, enabling NEC to deliver new value to society and its customers.

We proactively implement cutting-edge technologies across and beyond the organization, extracting, analyzing, and codifying the success factors.
This enables us to realize leading-edge DX at the fastest pace, backed by a proven track record.



Column One of Japan's Largest AI Supercomputers Supporting the Growth of NEC's AI Business

As the use of AI continues to expand, AI models are increasingly required to deliver both advanced capabilities and lower operating costs. In 2023, the Company developed NEC cotomi, a fully self-developed Japanese LLM, and has since continued to enhance models specialized for certain domains as well as functions for AI agents. Through these development efforts, NEC has accumulated expertise that enables it to condense specialized knowledge into compact models, making it possible to deliver AI capable of performing sophisticated tasks at a reasonable cost.

In addition, as NEC advances its transformation into an AI-native company, a robust foundation is essential to continuously develop and utilize AI itself. With this in mind, NEC plans to expand its proprietary AI supercomputer by 2028 to approximately three times its current scale as a foundation supporting the growth of its AI business. By leveraging one of Japan's largest AI infrastructures, spanning everything from R&D to service delivery, NEC will accelerate both its transformation into an AI-native company and the growth of its AI business.

2. Business Development Function for Providing Value

In terms of new business development, NEC is creating new value through diverse open innovation initiatives under the key message, "The future is ours to shape." Focusing on business domains centered on AI and data-driven value creation, NEC is promoting co-creation with start-ups, partner companies, government agencies, and academic institutions in Japan and overseas, leveraging its globally competitive technologies. NEC is driving the creation of new businesses by drawing on its long-cultivated expertise in business development.

New Business Creation Management Policy

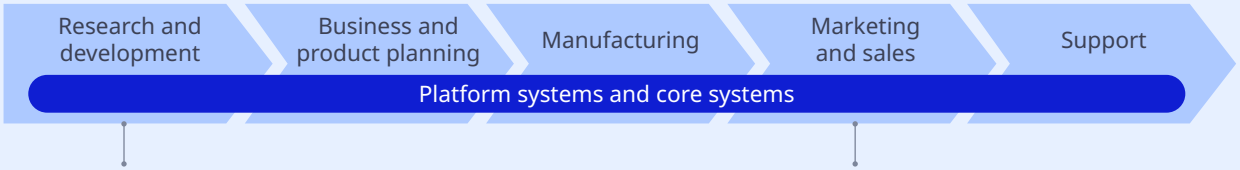
Many of NEC's new businesses are created through co-creation with a diverse range of partners in Japan and around the world. Business development is guided by a structured business development process and management framework tailored to each stage of development, enabling the Company to take on ambitious new ventures while appropriately managing risk. Currently, NEC is pursuing the creation of new businesses in fields where AI and data can generate significant value, including financial services, R&D, drug discovery, and sustainability. As for commercialization, NEC selects the most appropriate commercialization model based on the characteristics of each technology and business, whether through in-house business development, the establishment of start-ups, or entrepreneurship through NEC X and the Silicon Valley ecosystem. In addition, we are working to create further synergies and promote co-creation by offering the know-how gained through new business creation as consulting services.

Column Strengthening Company-wide Business Development Infrastructure

To efficiently and effectively create new businesses, NEC is developing the know-how it has cultivated over the years into a Company-wide business development infrastructure. In collaboration with business units, NEC is establishing mechanisms that accelerate the journey from new ideas to business creation and developing talent capable of leading business development. At the same time, the Company is increasing the visualization, codification, and utilization of innovation-related knowledge, including R&D activities. Through these efforts, NEC is building an environment that enables the rapid development of new businesses throughout the Company.

Examples of Business Development

Supporting AX Across the Entire Value Chain, from R&D to Marketing



AI-driven Development of Next-generation Materials

NEC is leveraging generative AI and agentic AI technologies to support the advancement of R&D. As one example of these efforts, NEC provides its Material Discovery Solution, which supports more efficient materials development. The solution identifies promising materials from vast volumes of literature, including academic papers and patents, while AI trained on researchers' expertise predicts the properties of promising new materials. By significantly reducing the time required for material discovery, which has traditionally been a time-intensive process, the solution contributes to innovation in the materials field.

New Customer Insights Enabled by AI Personas

NEC is helping companies transform their marketing by combining its proprietary AI with diverse data sources. BestMove is a solution that generates highly detailed AI personas based on consumer data, capturing purchasing behaviors, and attitudes. The solution performs everything from the identification of consumer insights to initiative planning and effectiveness forecasting. By supporting highly accurate, data-driven marketing initiatives, BestMove helps companies create greater value for their customers.

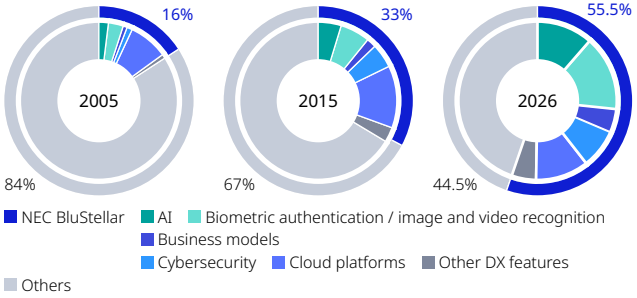
3. Business Contribution Through Utilization of Intellectual Property

Intellectual Property Strategies

NEC considers IP a key intangible asset for its business operations and, in order to achieve Mid-term Management Plan 2030, is focusing on the following initiatives:

1) Strengthen the patent portfolio in NEC BluStellar-related fields and other areas that contribute to the implementation of AI throughout society and the implementation of new comprehensive security technologies, as well as increase the overall number of foreign patent applications[1] in anticipation of further global business expansion.[2]

Shifting the Patent Portfolio Toward Growth Areas (U.S. Patents)



2) Promote real-world application of our technologies through various methods, including via pursuing licensing activities and assignment of intangible assets (such as patents and know-how). Cumulative patent licensing revenue during Mid-term Management Plan 2025 more than doubled compared to the previous five-year period and NEC is currently advancing initiatives for further growth.

3) Promote the DX of IP operations. Based on the knowledge, tools, and know-how accumulated through internal implementation under the "Client Zero" approach, NEC has begun offering IP DX solutions to external organizations. In addition, ABeam Consulting Ltd. is developing its IP business process transformation (BPX) business. By reducing the burden associated with IP operations and enhancing decision-making, NEC is helping to make Japan's IP more competitive on the global stage.

4) Promote international standardization strategies to accelerate the adoption of advanced technologies. This would be done by holding leading roles in domestic and international standardization committees and government committees in key technological fields.

1 The proportion of foreign filings (Paris Convention filings and Patent Cooperation Treaty (PCT) publications) among the total number of Japanese publications and PCT publications.

2 Foreign application rate: 52% (fiscal 2016 publications) → 67% (fiscal 2026 publications)

IP Activities as an "Innovation Cycle Driver"

With IP activities serving as a driving force, NEC is implementing the innovation cycle framework established in fiscal 2026 and promoting initiatives to translate its technologies and expertise into social value.

In the creation and protection phase, we protect new technologies, expertise, brands, and other assets through multiple approaches. This is underpinned by a robust infrastructure of IP activities, including the enhancement of IP operations through the in-house implementation of DX initiatives.

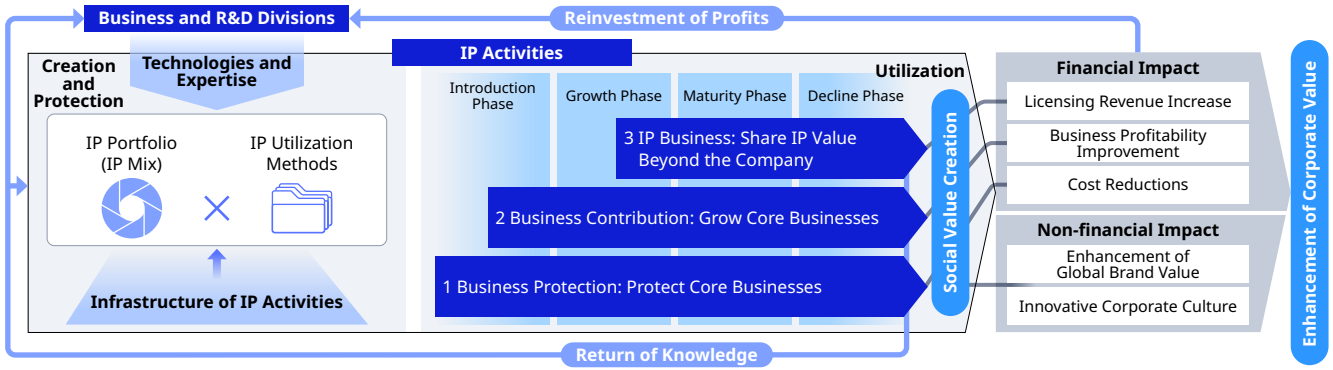
In the utilization phase, we draw on our accumulated IP utilization strategies to effectively use our IP portfolio in various forms throughout each stage of our business operations, steadily generating results.

1) Business Protection: Sustain competitive advantages and reduce costs by minimizing the risk of infringing on others' IP rights, thereby limiting licensing expenditures.

2) Business Contribution: Increase business profitability by maximizing the value of growing business areas, including NEC BluStellar, through the strategic use of IP.

3) IP Business: Achieve stable growth of licensing revenue by promoting diverse forms of IP licensing, including licensing of know-how and other intangible assets.

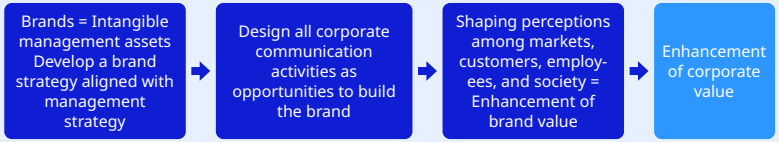
Continuous enhancement of corporate value occurs by the reinvestment of the profits and knowledge gained from IP utilization back into business and R&D activities.



Column Leveraging Brands as Intangible Assets

Rooted in its Purpose, NEC views every corporate activity as an opportunity to drive brand value. By integrating its brands, which are intangible assets, into its management strategy, the Company leverages them to enhance corporate value. Specifically, NEC has created the position of Chief Design Officer (CDO) and enhanced corporate communications through initiatives such as CEO communications and the development of brands including NEC BluStellar. In addition, the Company protects and leverages brands and designs as IP, contributing not only to non-financial value creation but also to improved financial performance.

Through these efforts, NEC continues to strengthen its brand and remain a company chosen by the market, thereby supporting the business growth targeted under Mid-term Management Plan 2030.



Note: The abovementioned initiatives received the Distinguished Service Award for Design Management from the President of the Japan Patent Office in 2024, and the Excellence Award at the FY2025 Intellectual Property and Intangible Asset Governance Awards.