

# NEC Innovation Day 2024

## Driving NEC's Growth: Advanced Technology Development and Expansion into New Business Areas

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# Driving NEC's Growth: Advanced Technology Development and Expansion into New Business Areas

## ● NEC's innovation creation scheme and strengths of NEC's R&D

## ● Contributions to existing businesses through global No.1 technologies

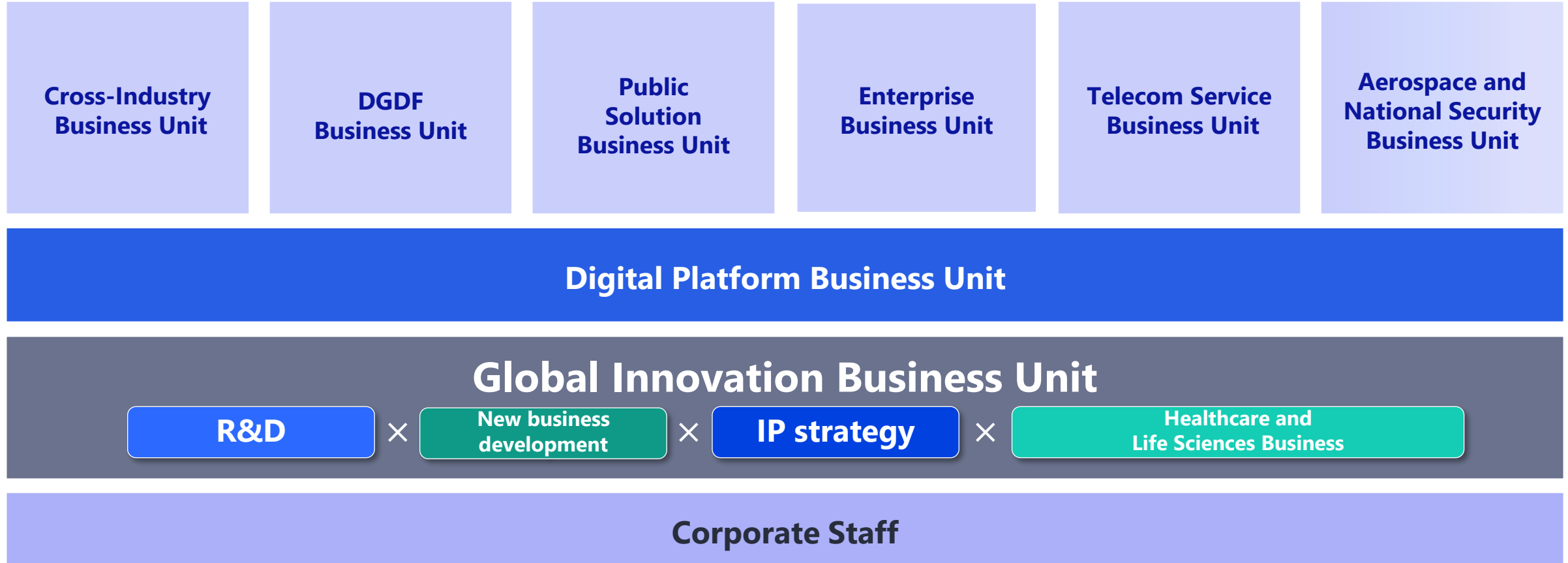
1. Shifting towards system integration with AI Agents
2. Advancing biometric technologies for use anytime, anywhere
3. Visualizing the Earth with satellite communications and advanced image analysis (from disaster prevention to adaptation)

## ● Creation of new growth businesses

1. Expanding the intellectual property licensing business (including AI drug development business)
2. Progress in various new businesses

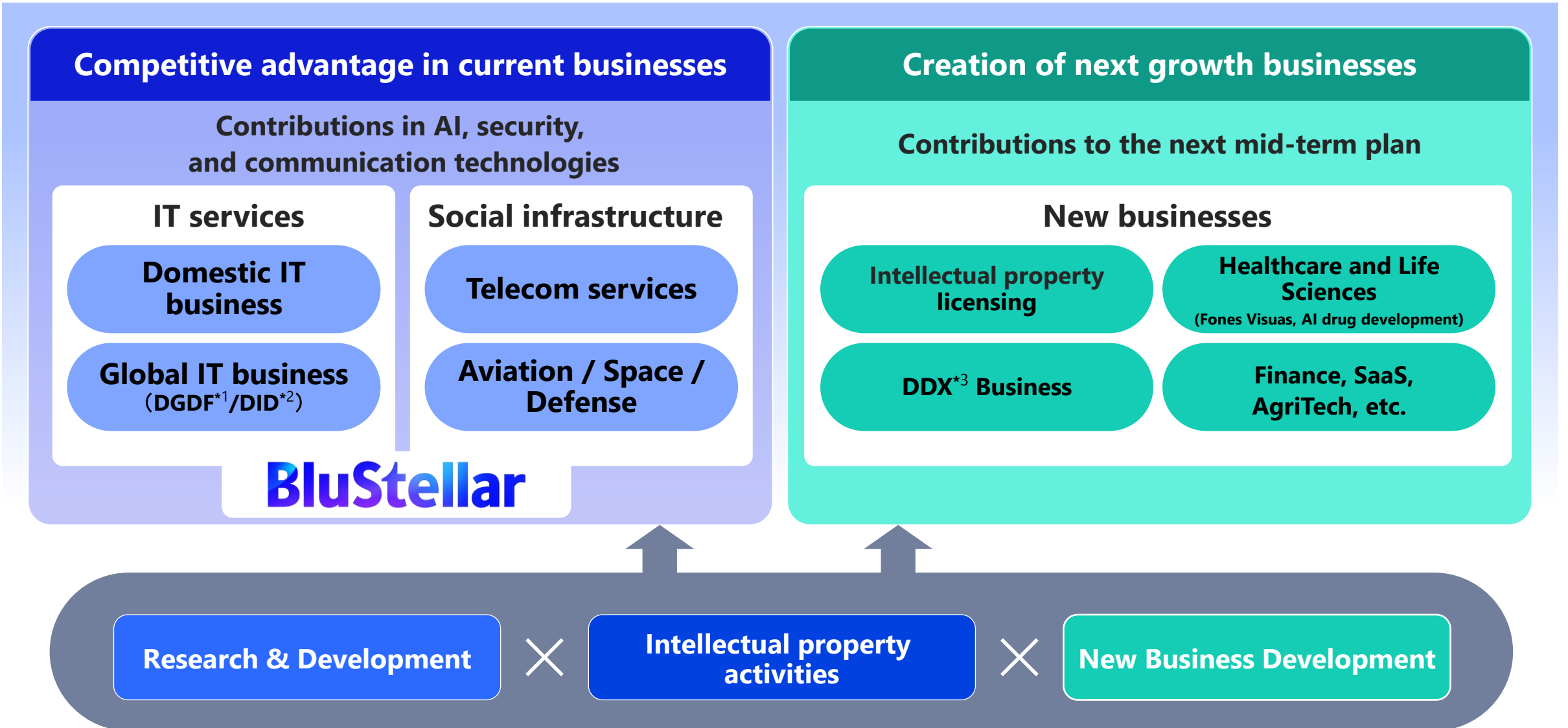
# NEC's innovation creation scheme and strengths of NEC's R&D

# NEC Organizational Structure (April 2024)



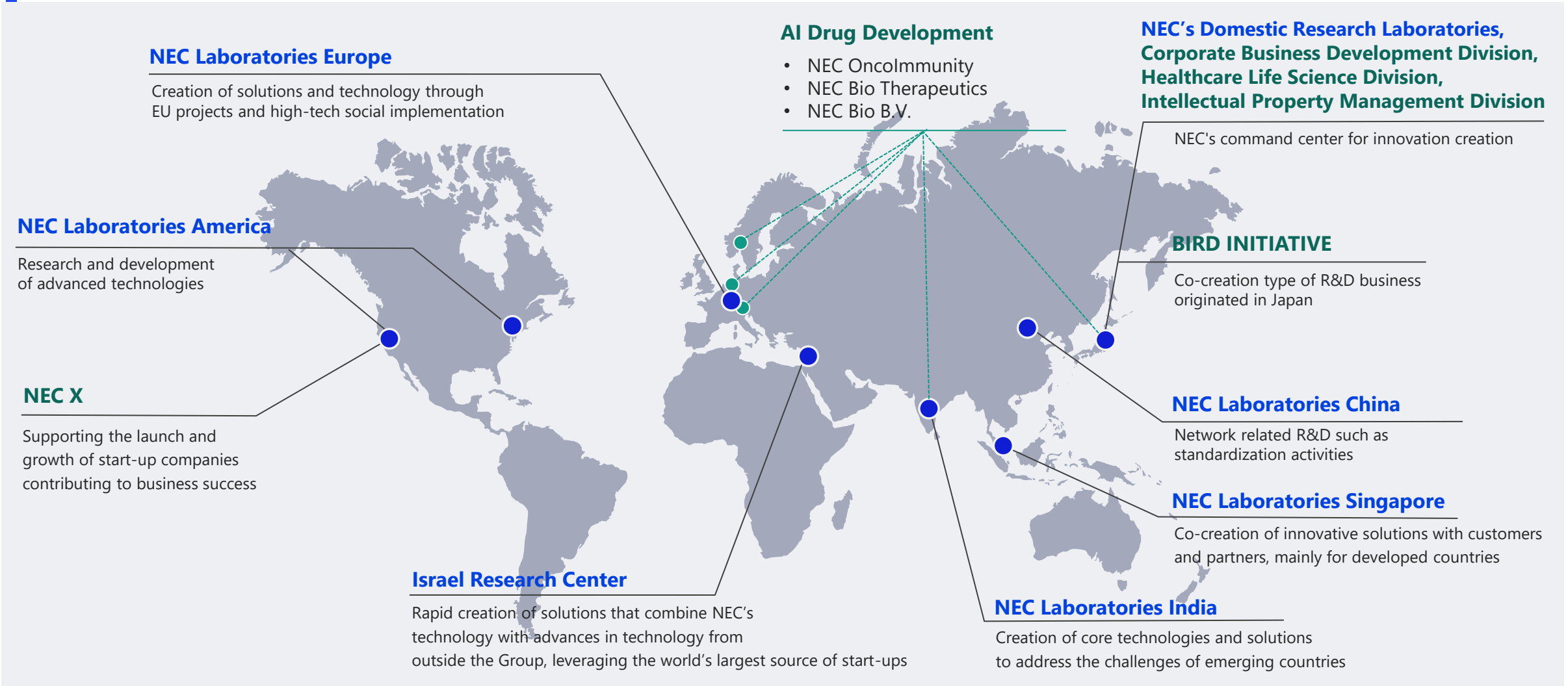


# Overview of NEC's Innovation Creation Scheme



# R&D and business development utilizing our global assets

## A team of 2,000 specialized professionals. 40% of our R&D team is based overseas.



## High technological competitiveness on a global scale

# Demonstrating world-class technological competitiveness in AI, security, telecommunications, and other fields at major international conferences

## AI

### Machine learning

The number of papers accepted by top-quality international academic conferences\*1

**Ranked 10<sup>th</sup> in the world**

### Ranking of papers accepted at leading academic conferences (company-based)

Rank	Company name	# of papers
1	Google*2	2562
2	Microsoft	1668
3	IBM	1129
4	Meta Platforms	675
5	Amazon	481
6	Alibaba	404
7	Huawei	362
8	Yahoo	357
9	Tencent	322
<b>10</b>	<b>NEC</b>	<b>246</b>

2000-2023 : Our research

### Video & image processing

The number of papers accepted by top-quality international academic conferences\*3

**Ranked 1<sup>st</sup> in Japan**

### Awarded the Medal with Purple Ribbon in 2023

#### Hitoshi Imaoka, NEC Fellow

“Developing high accuracy face recognition technologies that contribute to global safety and security”

### CEATEC's The 25th Anniversary Special Award

CEATEC  
AWARD

“NEC's Video Recognition x Generation AI for Industrial DX Promotion and Business Efficiency”

## Security

### Cyber Security

Yamashita Memorial Research Award, CSS2021, etc.\*4

**Received numerous awards**

## Communication

### Optical Communication

Acceptance of papers in top academic conferences\*5

**47th consecutive year**

\* 1 NeurIPS, ICML, ECML-PKDD, KDD, ICDM

\* 2 Google includes Google-DeepMind

\* 3 CVPR, ICCV, ECCV, ACCV, ICPR

\* 4 ACM CCS, Eurocrypt, IEEE S&P, and others

\* 5 OFC/ECOC, and others

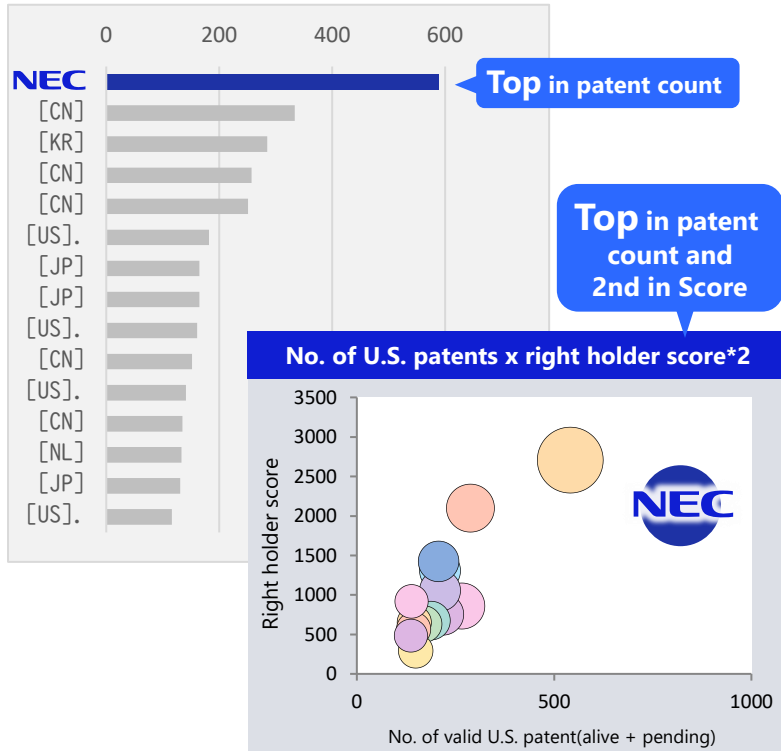


# Global No. 1 in AI Intellectual Property (Biometric authentication, Video recognition, Analysis/Prescription AI)

Biometric authentication, video recognition, and analysis/prescription AI are NEC's core technologies across various business sectors and No.1 in accumulative PCT\*1 international patent applications, aiming to be the global No.1 patent portfolio in each area by 2025

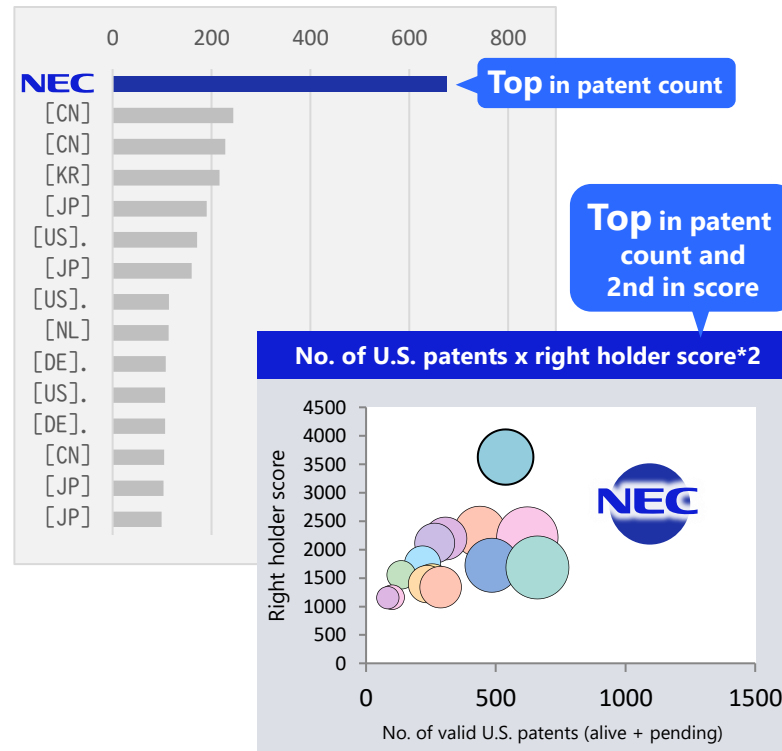
## Biometric authentication

Number of accumulative PCT international patent applications



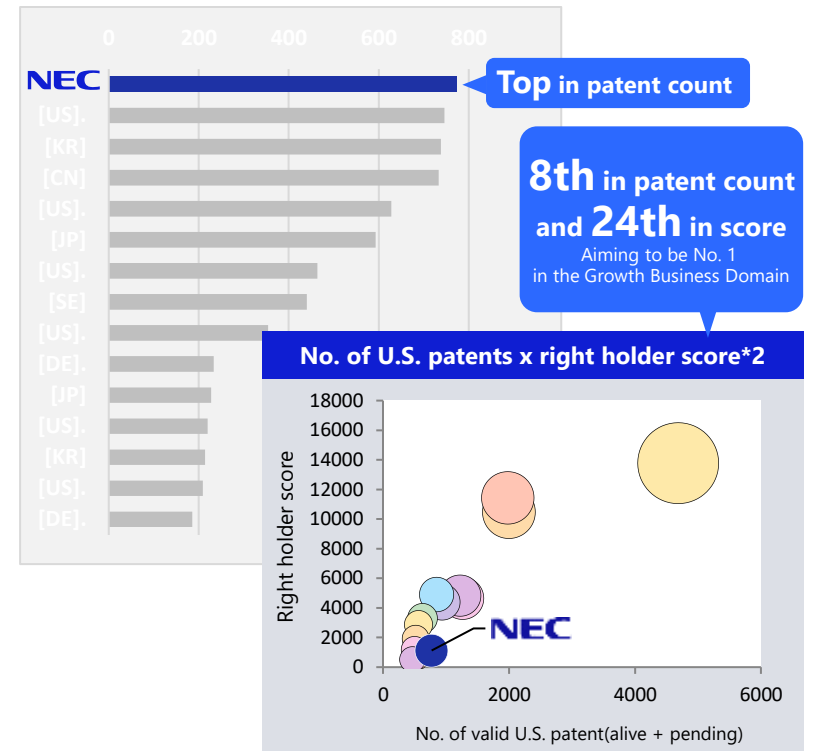
## Video recognition

Number of accumulative PCT international patent applications



## Analysis/Prescription AI

Number of accumulative PCT international patent applications















\*1 PCT:Patent Cooperation Treaty

\*2 Right holder score: index for strength of patent portfolio of each patent right holder by Patent Result Co.

October 2024 (Research by NEC)

# Preparing for inflection points for business growth based on technology vision

We are in an era where once-in-a-century breakthroughs are occurring simultaneously, including generative AI, quantum computing, satellite networks, and advancements in life sciences. Starting in FY2021, we have begun publicly sharing our technology vision to enhance collaboration with external partners.

 <b>Generative AI</b> 	 <b>Quantum computing</b> 	 <b>Space Technology</b> 	 <b>Life Science</b> 
<b>Potential to simulate advanced human expertise</b>	<b>Advancements in error correction and the resolution of technical challenges</b>	<b>Civilian applications of satellite networks and sensing</b>	<b>Overcoming a wide range of diseases through genome analysis</b>
<p>The integration of AI into diverse social activities is driving significant transformation across society, industry, and daily life</p>	<p>Accelerated quantum and molecular computations could dramatically speed up the development of new materials and pharmaceuticals</p>	<p>Building resilient social infrastructure equipped with robust communication functions to ensure reliability during disasters and emergencies</p>	<p>Leveraging AI and cutting-edge HPC* technologies for genome analysis to drive IP creation, develop new drug businesses, and revolutionize social infrastructure</p>
<p><b>NEC technology</b></p> <p><b>NEC cotomi: our lightweight and advanced generative AI solution</b></p> 	<p><b>NEC technology</b></p> <p><b>quantum computing technology</b></p> 	<p><b>NEC technology</b></p> <p><b>Long-range optical inter-satellite communication (Gbps/40,000km)</b></p> 	<p><b>NEC technology</b></p> <p><b>AI drug development technology (Infectious diseases, various types of cancer)</b></p>  <p>* High Performance Computing</p>

# NEC BluStellar integrates advanced technologies to secure competitive advantage

## Management Agendas

**Innovation in Society and Business**

**Reforming Customer Experiences**

**Business Transformation**

**Transformation of Organizational and Human Resource**

**Transformation of Digital Platforms**

### Business Model

BluStellar Agenda

End-to-end approach to solving our clients' management agendas  
Value creation success stories and best practices



### Technology

BluStellar Technologies

Provide services that rapidly integrate the technology accumulated since the company's inception and the expertise of the research institute

### Organization / Human Resources

BluStellar Programs

Problem solving with more than 10,000 DX professionals  
Talent and knowledge  
Co-creation programs with customers

# Contributions to existing businesses through global No.1 technologies

1. Shifting towards system integration with AI Agents
2. Advancing biometric technologies for use anytime, anywhere
3. Visualizing the Earth with satellite communications and advanced image analysis (from disaster prevention to adaptation)



# Contributions to existing businesses through global No.1 technologies

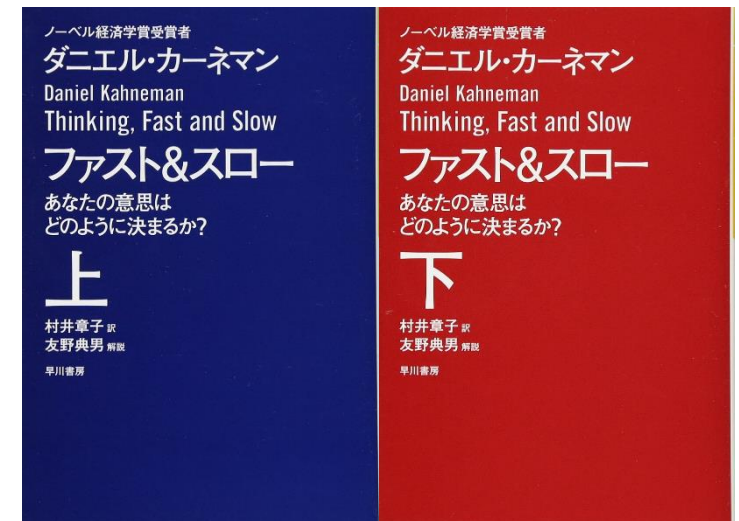
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# Daniel Kahneman: “Thinking, Fast and Slow”

Answer quickly:  
what is the color  
of the next word?

Red

Your system 1 made you want  
to answer “red”,  
your system 2 made you  
decide for “green”.



“Thinking, Fast and Slow” by Daniel Kahneman  
『ファスト&スロー』ダニエル・カーネマン、村井章子訳、早川書房



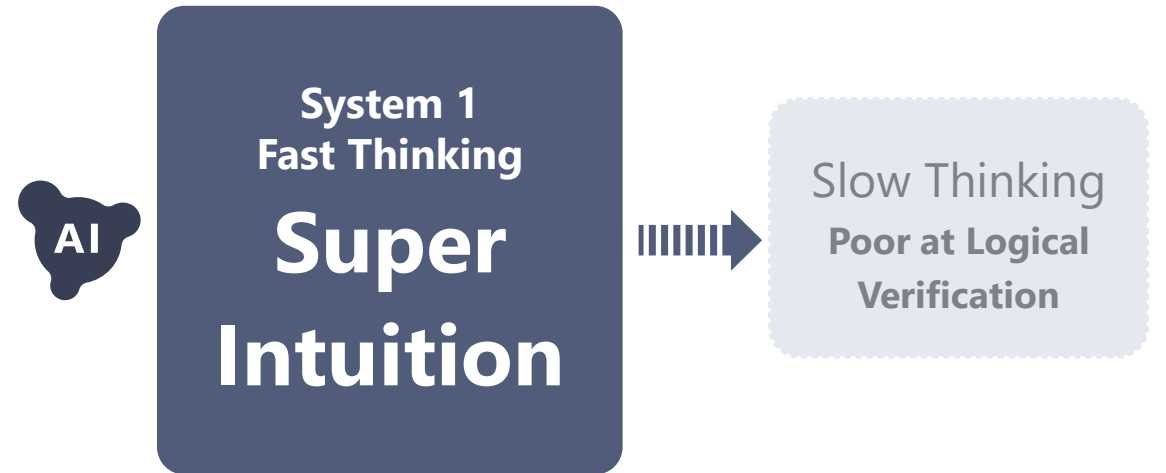
# Human Intelligence

Humans verify intuition and logic each other



# LLM Intelligence

LLMs have super intuition but lack sufficient logical thinking



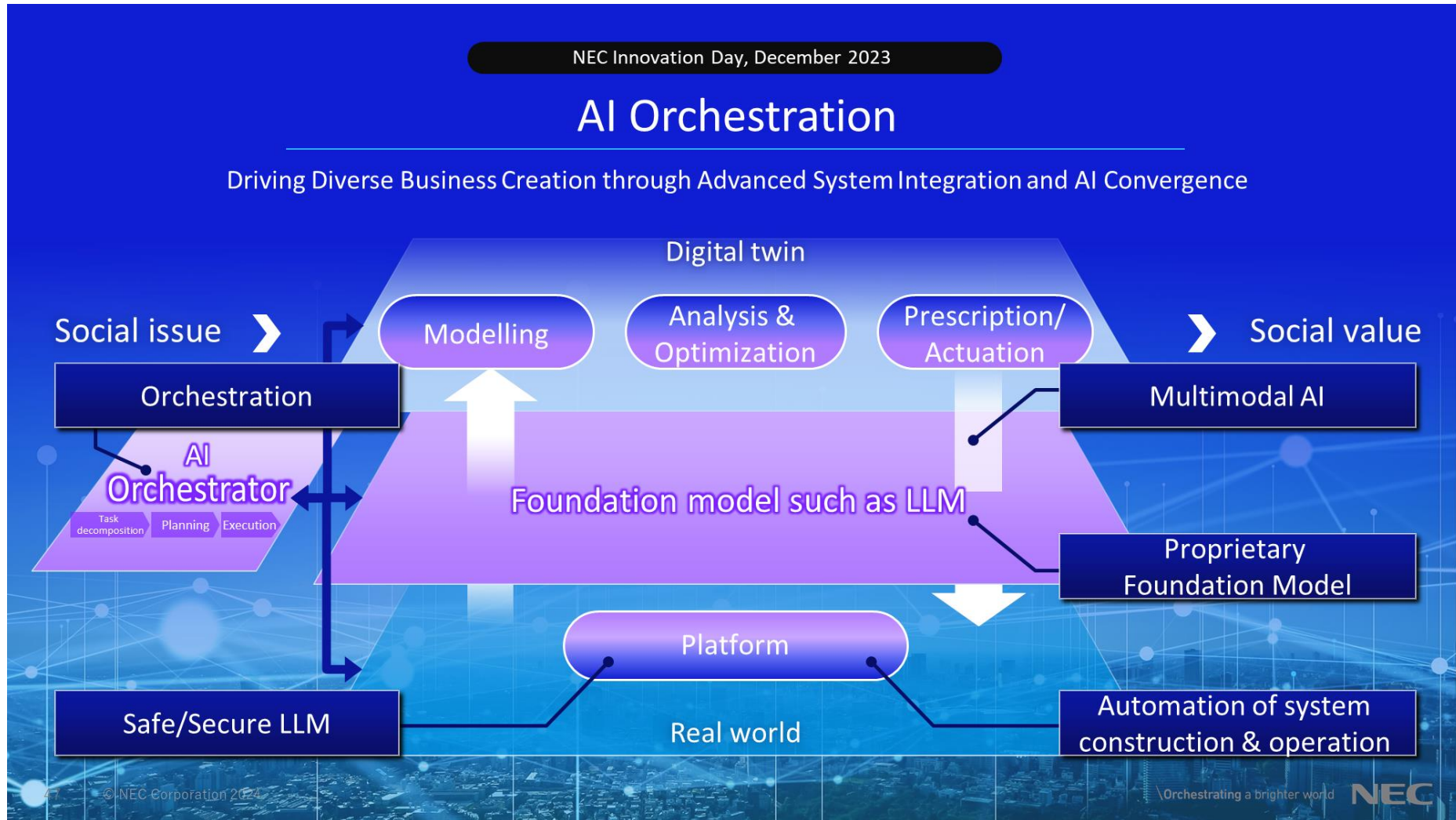
# NEC's vision for AI development

NEC envisions a transition from conversational capabilities and enhanced logical thinking to the deployment of AI agents that drive autonomous growth and foster business innovation.



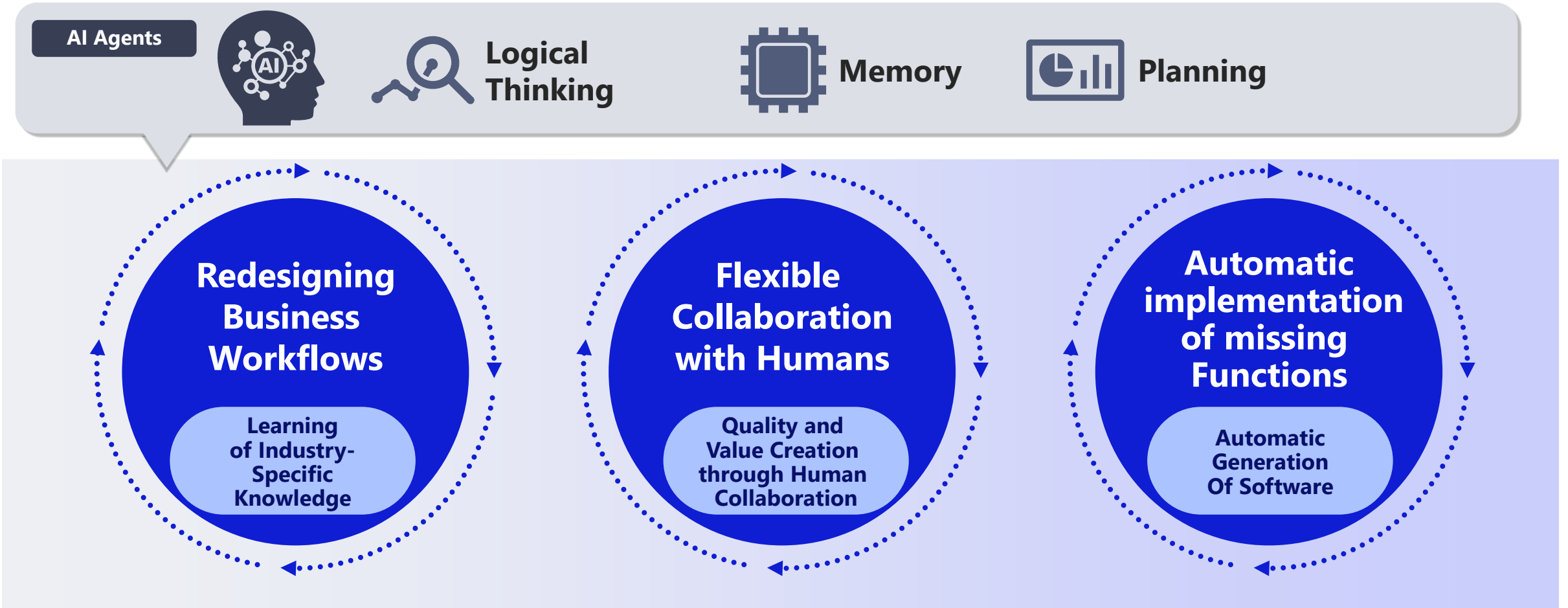
## AI Orchestration(presented in December 2023)

# NEC introduced AI Orchestration, showcasing its concept for AI Agents.



## NEC's Aim of AI Agents ~A Dynamic IT System that continues to evolve and grow~

AI systems that break down complex and sophisticated workflows into individual tasks and collaborate flexibly with humans. The missing features are autonomously recognized, designed, embedded, and operate the task autonomously and sustainably in real time



## Shifting to System integration incorporating AI agents

Current IT systems realize predefined specifications and provide fixed value.

⇒ Future IT systems will continue to expand the value they provide and evolve autonomously (just like talented human resources)

### Current IT Systems

The value provided  
are fixed

Formulaic Interface

The Differentiating  
Factors are Quality/Costs

### IT Systems Aimed by NEC's AI Agents

The value provided will  
Autonomously expand and improve

Interface similar  
to instructions to human

The differentiating factors are (1) basic technological capabilities that support AI agents, and (2) the ability to design new workflows.

**NEC co-creates new industry workflows with customers and provides highly accurate AI agent technology, security, and eco-friendly systems that provide high value.**



# Shifting to the System integration incorporating AI agents

## Anticipated markets for AI agent implementation



### Required initiatives and core technologies

Product Announcements

#### Enhanced AI models

Enhanced LLM performance  
(speed&accuracy)

Product Announcements

#### NEC AI Agent

Core technology for agent-based automation  
(Former AI Orchestrator)

Product Announcements

#### Multimodal support

Capturing Real-world sensing  
information like images, sounds, etc.

Detailed Manu

#### Addressing AI regulations

Ensuring prompt and effective compliance  
with increasingly stringent global AI regulations

#### Eco-Friendly Generative AI

Improving energy efficiency by efficient GPU use

Today we will announce industry-specific initiatives and common platform technologies (products)



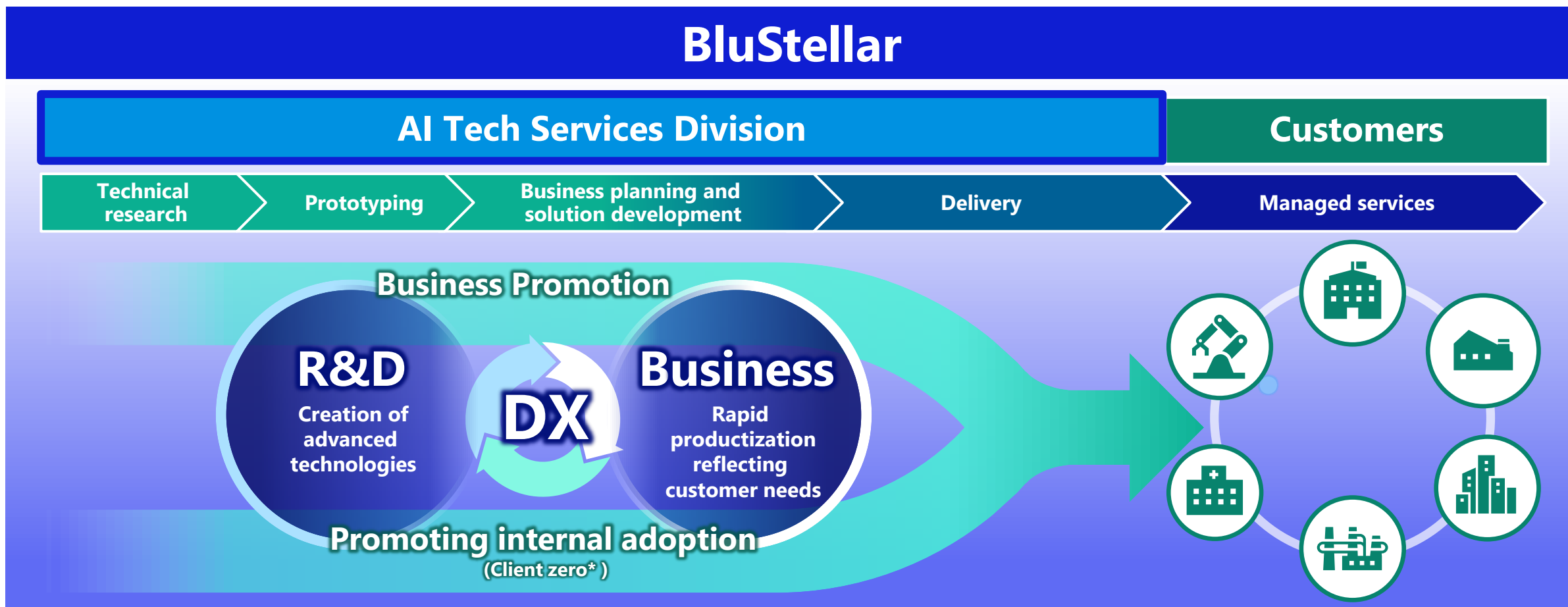
NEC  
Corporate Senior Vice President  
Managing Director, AI Technology Service Business Division

# Akio Yamada



## Establishment of AI Tech Services Division

With the establishment of the AI Tech Services Division, the generative AI business will be seamlessly launched by integrating market exploration, productization of research outcomes, and go-to-market strategies.



\* Client Zero: Practice with your company as the 0th client. Contribute to the promotion of DX for clients and society by providing lively experience and value.

## Expansion of the Service Business

# Enhancing customer experience and operational efficiency in DX solutions through generative AI

Beginning with the hospital-focused DX solution MageOak/iS, we are also contributing to the transformation of business processes in the manufacturing sector with the PLM solution Obligato.

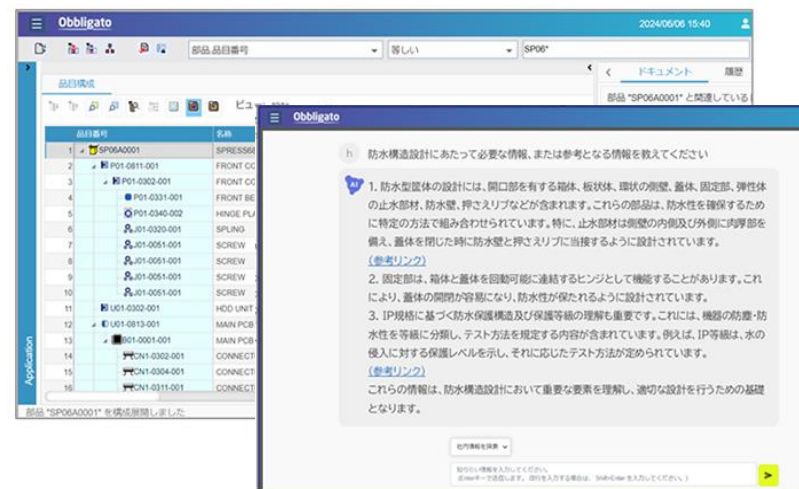
Press release on November 20, 2024

Began sales of the electronic medical record system MegaOak/iS equipped with generative AI

Launched Obligato with integrated generative AI capabilities



Launched in March 2024



Available from November 2024

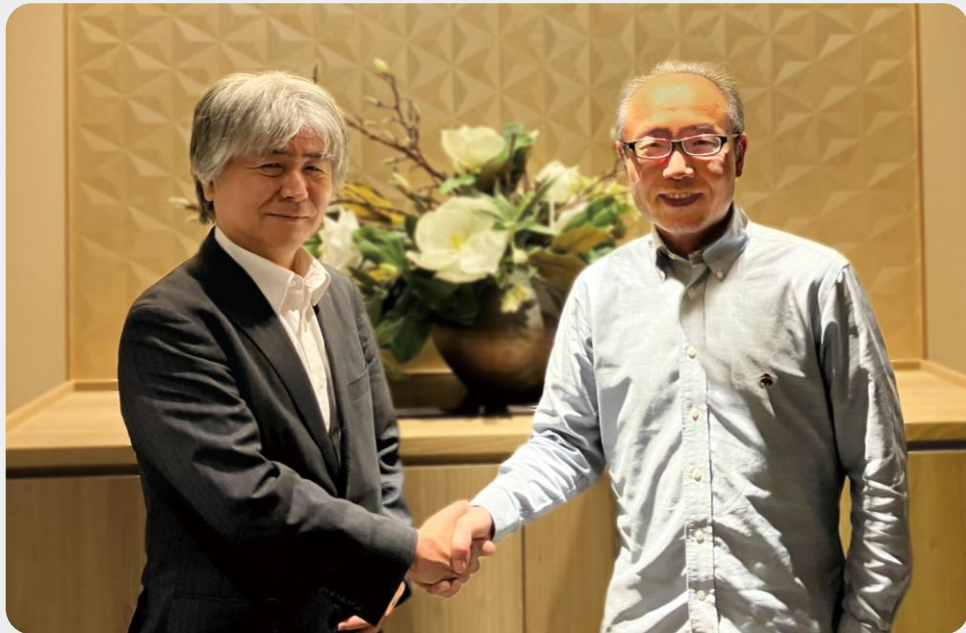
Contributing to reforming doctors' working conditions in healthcare settings experiencing severe staffing shortages

Enhancing the sharing of expertise among experienced engineers and improving the efficiency, accuracy, and speed of design operations

# NEC is collaborating with Sakura Internet in the generative AI platform domain to meet the demand for services that prioritize reliability and safety.

Press release on November 25, 2024

Sakura Internet's platform for generative AI,\* is implementing NEC generative AI "NEC cotomi". NEC is the first to provide LLM for the platform service



\*Press Release: "Sakura Internet Begins Development of Platform Service for Generative AI - Enabling a Fully Domestic Solution From Cloud Infrastructure to Application" <https://www.sakura.ad.jp/corporate/information/newsreleases/2024/11/25/1968217720/>



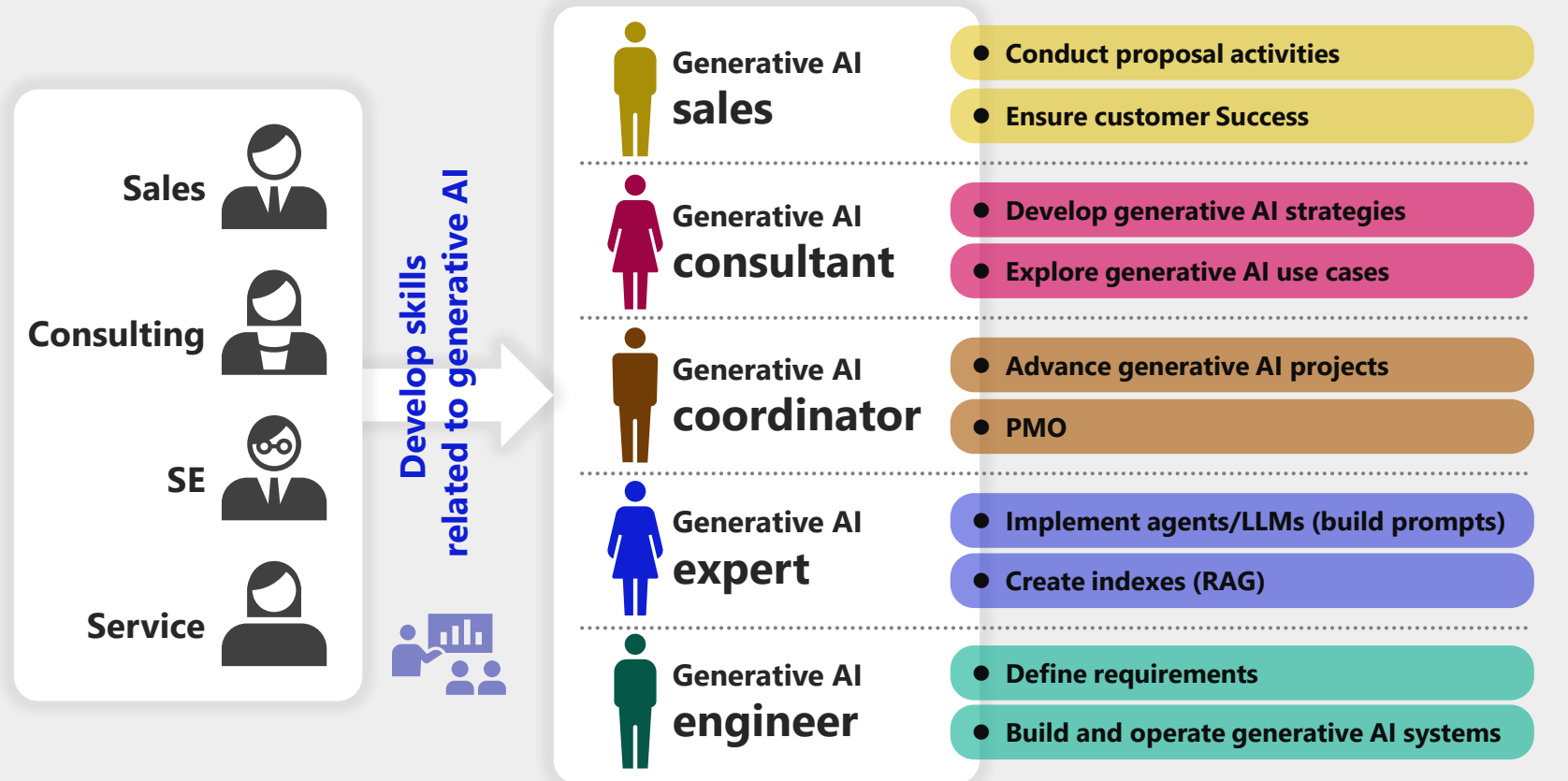
## Developing talent to support AI Transformation

NEC is advancing talent development to support business growth, with 450 individuals having completed the LLM course by October 2024 and plans to increase this figure to 1,000 participants.

The workforce is being expanded, including reskilled personnel, to support the entire digital transformation lifecycle for customers, from planning to implementation and operations

### LLM SkillUP STUDIO

Courses began in June 2024 with **450** unique enrollees having completed the course by October



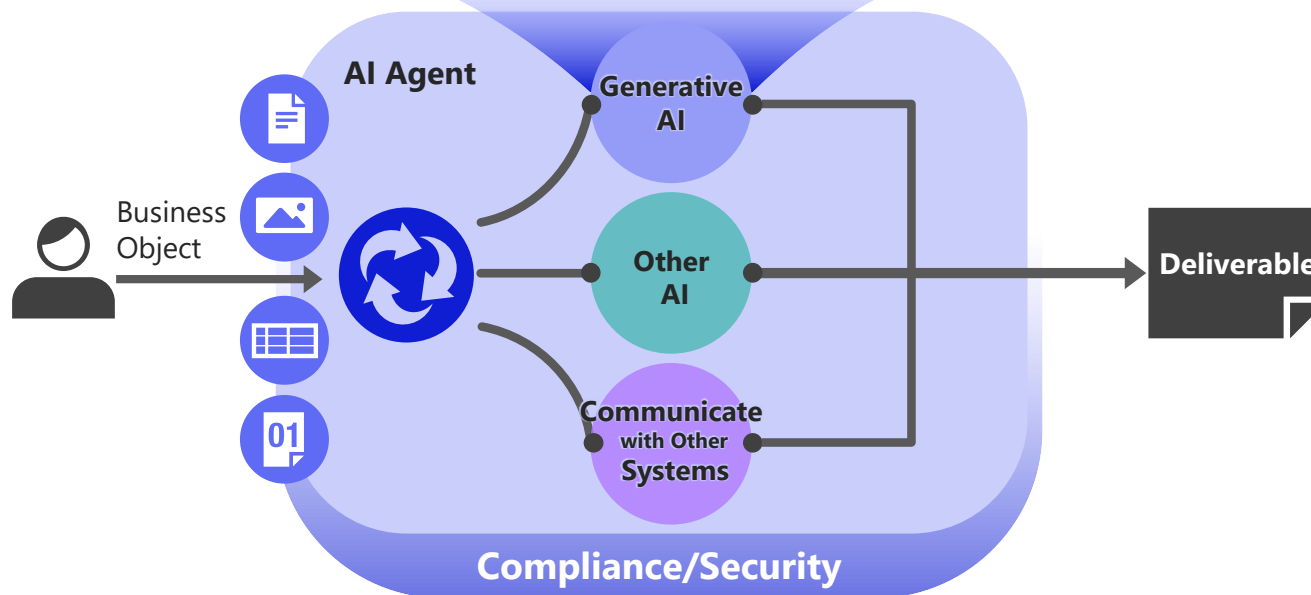
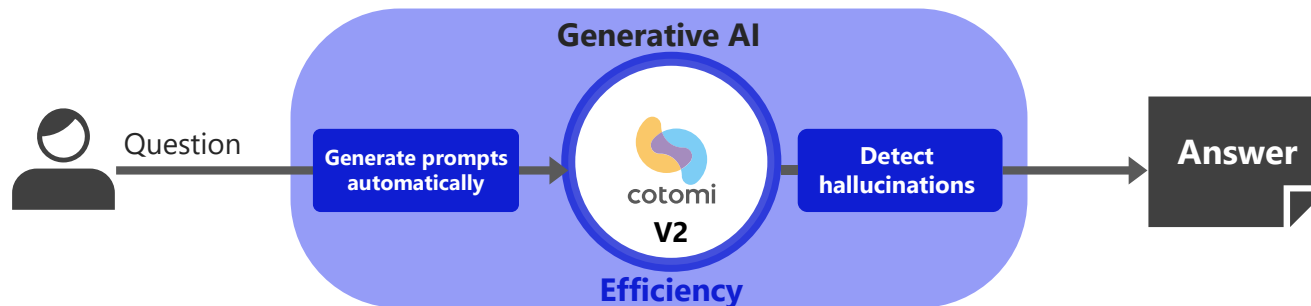
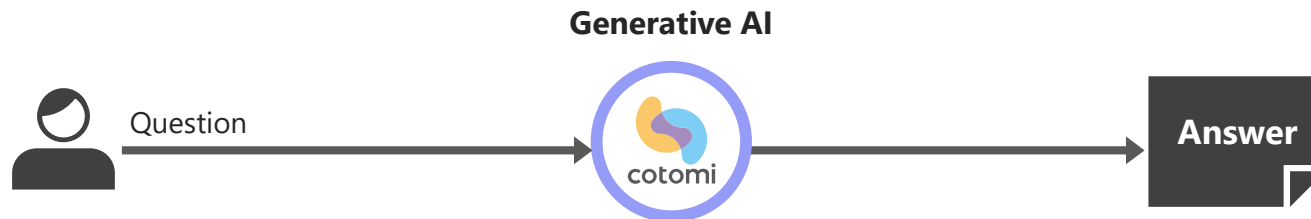
# Three advancements

in NEC Generative AI are being harnessed for further business process improvements

**1** Enhancing AI models for automating complex tasks

**2** Deploying the NEC AI Agent for streamlined automation

**3** Expanding capabilities with multimodal support





Press Released on November 27, 2024

# 1 Enhancing AI models

We are enhancing NEC cotomi's world-class Japanese language processing capabilities to further support advanced workflow automation. This initiative targets fields like healthcare and finance, where high levels of accuracy, logical thinking, and efficiency are crucial.

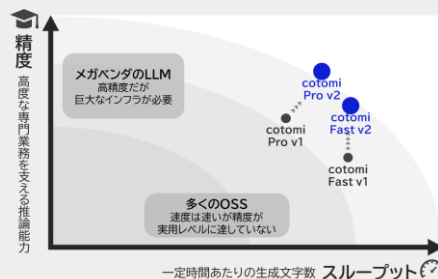
## Key points

Highlighted

- Enhance world-class accuracy and speed
- Improve reliability by providing supporting evidence
- Reduce prompt creation burden through self-learning
- Double power efficiency without compromising performance

### NEC cotomi v2 World-class Japanese processing

Public announcement: November 27, 2024



### Enhancing LLM reliability: Anti-hallucination measures

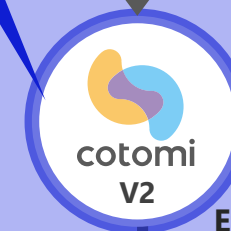
Public announcement: September 18, 2024



Generative AI

Expand prompts automatically

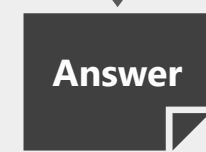
Self-learning for practical applications in workflows



Efficiency

Eco-friendly generative AI: (Improving energy efficiency during use)

Detect Measurement



## 2 Deploying the NEC AI Agent for streamlined automation

Starting in December, NEC will begin a phased rollout of the NEC AI Agent Service, which enables autonomous enterprise search, positioning us ahead of the competition

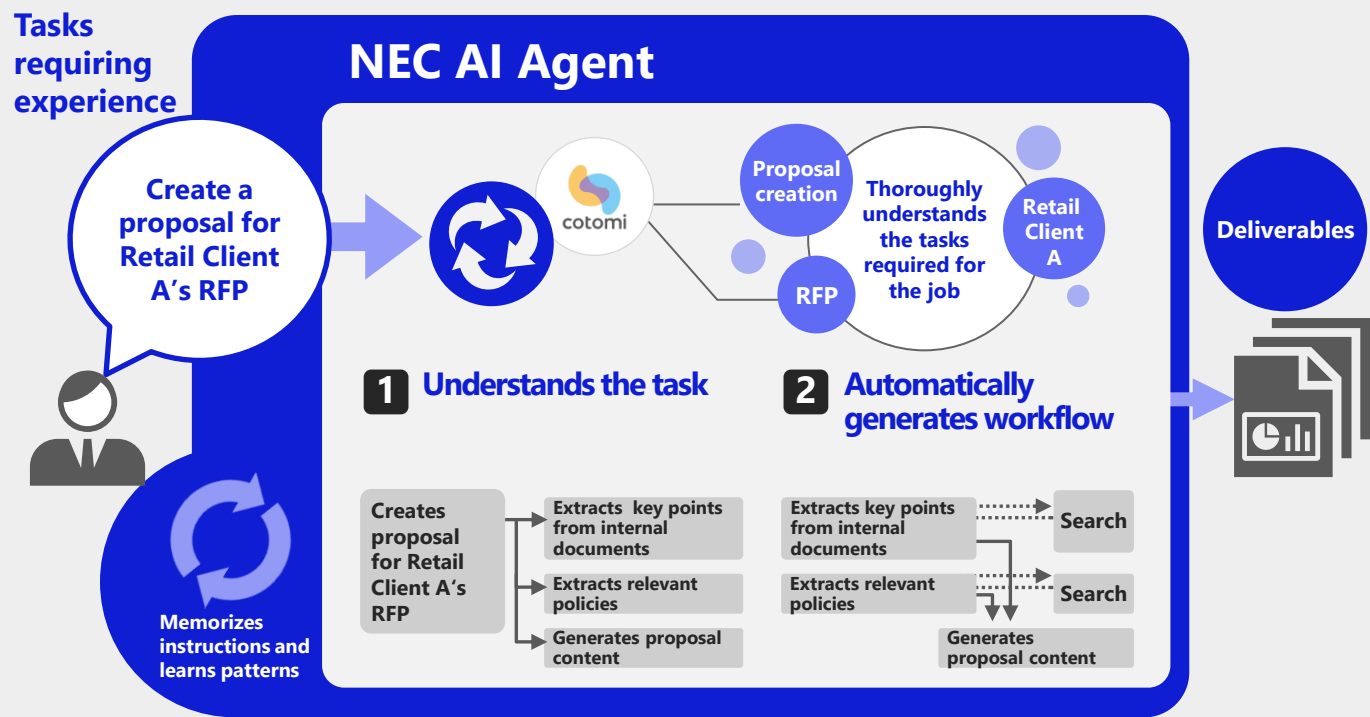
Exhibit2

Press release on November 27, 2024

### Key points

- Autonomously executes business processes with minimal guidance
- Task flow optimization ensures precise and efficient operations

The NEC AI Agent independently thinks and solves problems without relying on predefined rules



### 3 Expanding capabilities with multimodal support

Starting in March, we began providing a feature that uses retrieval-augmented generation (RAG) to harness information from diverse multimodal sources, leveraging our internal expertise to accelerate the automation of specialized tasks.

#### Key points

- Comprehends the structure of charts and diagrams to accurately interpret the flow of the text
- Recognizes implicit rules within these charts and diagrams to extract precise information

NEC AI Agent allows seamless use of customer-owned data, including charts and tables, without the need for manual review, thereby enhancing the quality of responses.

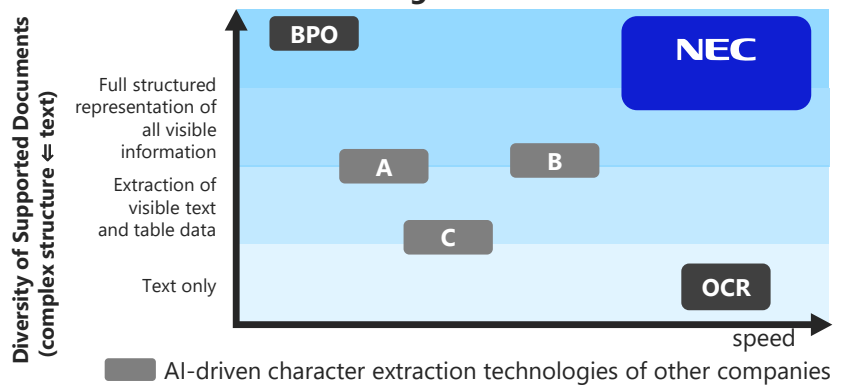
Understand as a unified whole

For office work

Large screen size

Grasps the purpose of the charts and tables

Positioning of NEC's technology for understanding charts and context



# Ensuring prompt and effective compliance with increasingly stringent global AI regulations

**Comprehensive risk management framework** Based on the METI's AI Guidelines for Business Appendix

	Risks associated with generative AI	External attack risks	Internal use risks
Solving with technology	Hallucination	N/A	<b>AI Firewall</b> Detecting issues
	Leak of confidential information	<b>AI Firewall</b> Filtering various risks	<b>Anti-hallucination feature</b> Assists in correcting problems
	Misuse through jailbreaking		Technology for handling sensitive information
	Blindly trusting disinformation and misinformation	Misinformation analysis technology	
	Reproduction of bias (Prejudice, ethics, etc.)	<b>AI Testing</b> Risk Assessment for generative AI	
	Solution with systems	Copyright infringement	<b>Governance development and rule-making</b>
Infringement of prescribed licenses and qualifications (Such as medical or legal)			



Seamless integration  
from R&D to GTM

Proactive use in  
Internal operations

Continuous enhancement  
of NEC AI Agent

Rapid delivery  
of value

Demonstration of  
cutting-edge practices

Accelerating  
Business Process  
transformation



**NEC AI Agent is  
everywhere**



# Contributions to existing businesses through global No.1 technologies

1. Shifting towards system integration with AI Agents
2. Advancing biometric technologies for use anytime, anywhere
3. Visualizing the Earth with satellite communications and advanced image analysis (from disaster prevention to adaptation)



Sustaining world-class expertise in biometrics: face, iris, and fingerprint

Ranked No. 1 in the world in benchmark tests conducted by NIST\*1 (Jan. 2024)



Face recognition

World No.1



FRTE (2024/1 \*2)

- FRVT (2019)
- FIVE (2017)
- FRVT (2013)
- MBE (2010)
- MBGC (2009)

No.1 in FRVT Ongoing 2021/8\*3 and 2022/1\*4



Iris recognition

World No.1



IREX 10 (2022\*5)

- IREX 10 (2021)
- IREX IX (2018)
- (Iris Exchange IX)



Fingerprint recognition

World No.1



- MINEX (2016,2006)
- PFT/PFT II (2013,2009)
- FpVTE (2012,2003)
- SlapSeg (2004)
- ELFT (2007)

\*1 National Institute of Standards and Technology. Results shown from NIST do not constitute an endorsement of any particular system, product, service, or company by the U.S. government.  
 \*2 FRTE Identification (Jan 2024) Leaderboard Identification (T>0) Achieved No.1 ranking in 4 categories on the leaderboard: Gallery: Mugshot, Probe: Mugshot, N=12000000; Gallery: Visa, Probe: Kiosk, N=1600000; Gallery: Border, Probe: Border ΔT≥10YRS, N=1600000; Gallery: Mugshot, Probe: Mugshot ΔT≥12YRS, N=3000000.  
 \*3 FRVT Ongoing 1:N Identification (Aug 2021) Leaderboard Identification (T>0) Achieved No.1 ranking in 2 categories on the leaderboard: Gallery: Mugshot, Probe: Mugshot, N=12000000 and Gallery: Border, Probe: Border ΔT≥10YRS, N=1600000.  
 \*4 FRVT Ongoing 1:N Identification (Jan 2022) Leaderboard [Identification (T>0)] Achieved No.1 ranking in 3 categories on the leaderboard: Gallery: Mugshot, Probe: Mugshot, N=12000000; Gallery: Border, Probe: Border ΔT≥10YRS, N=1600000; Gallery: Mugshot, Probe: Mugshot ΔT≥12YRS, N=3000000.  
 \*5 IREX 10: Identification Track(Sept 2022) Achieved No.1 ranking in 3 categories: Two-eye Accuracy, Single-eye Accuracy, Rank Accuracy.

# Market expansion through global No.1 technology

Expand the market to all scenes by enhancing Implementation ability  
(high performance, small size, light weight, robustness)



## Accelerating widespread adoption through integrated sensors

Lightweight yet maintaining accuracy, the system enables face recognition even in natural light environments, allowing for easy deployment across various sites.

### Results of collaboration between NEC and Sony Semiconductor Solutions, Inc. (SSS)

#### Lightweight Face Recognition

Achieves lightweight design with accurate face detection and feature extraction

AI camera Prototype being developed by SSS

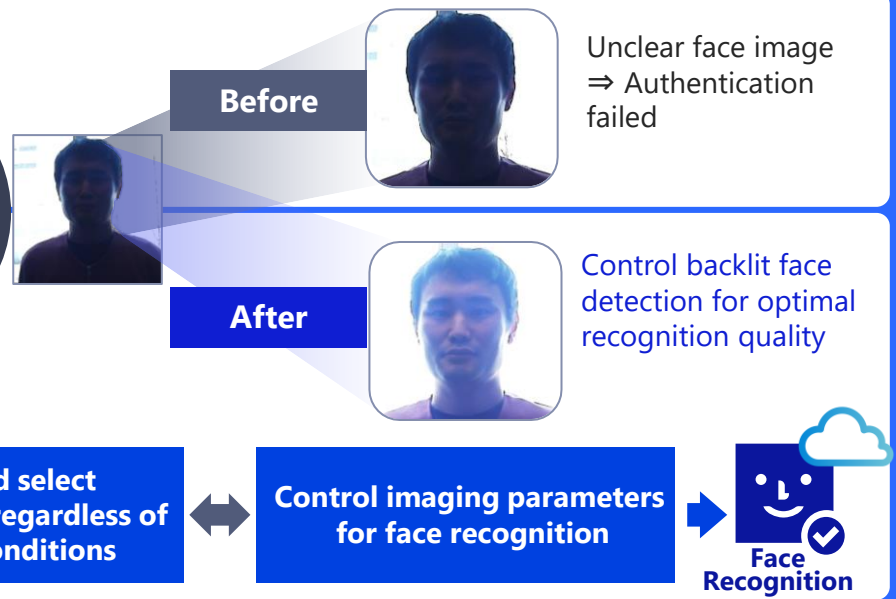


- Face detection
- Feature extraction
- Liveness detection

Only face matching is performed in the cloud

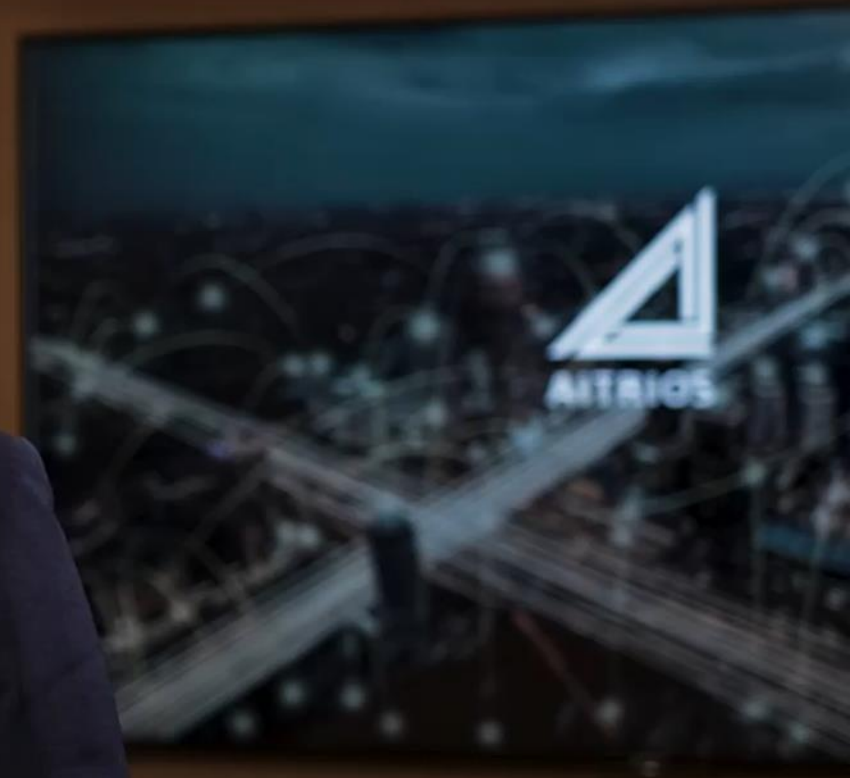
#### Real-time Adaptation to Ambient Light

Outdoor and backlit environments



ソニーセミコンダクタソリューションズ株式会社  
システムソリューション事業部 事業部長

**柳沢 英太**





# Compact and high-accuracy multimodal authentication



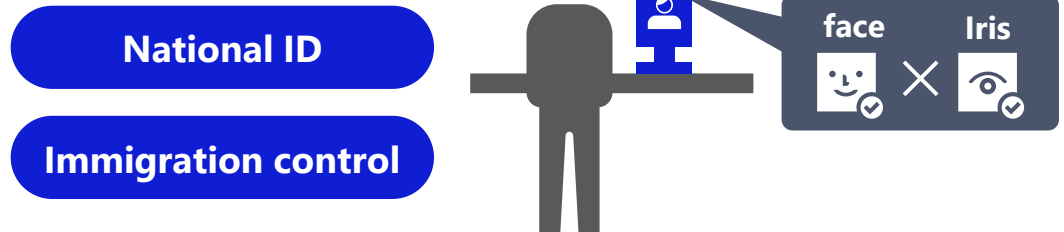
We've achieved iris authentication even with small low-resolution standard cameras. It supports over 10 million users combined with facial authentication.

- By combining the world's No.1\* facial and iris authentication, we have achieved multimodal biometric authentication on dedicated terminals, embedded systems and portable devices

## Fast and accurate authentication even with low-resolution images, enabling diverse use cases

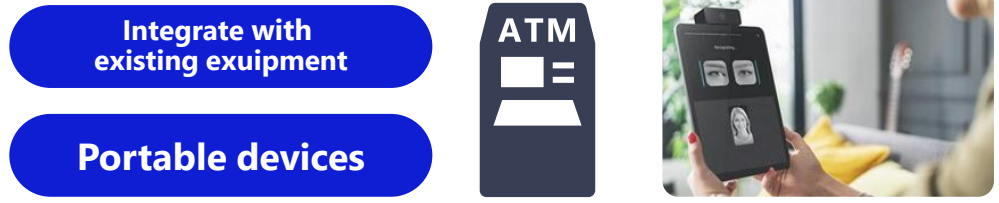
### with dedicated terminals

#### Ultra-high precision authentication



### for existing systems and portable devices

#### Enabling wide range of applications even with low-resolution images



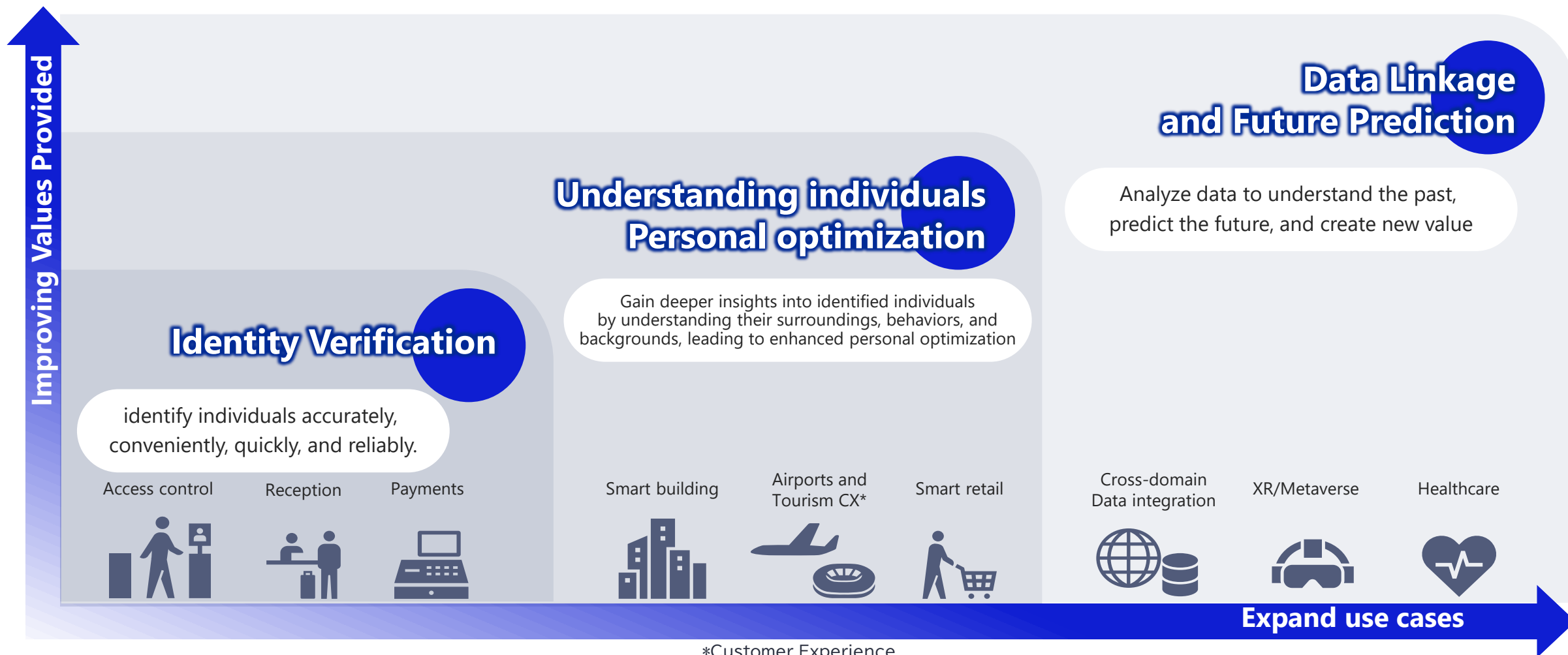
\* FRTE Identification (Jan 2024) の Leaderboard [Identification (T>0)] Achieved No. ranking in 4 categories: Gallery: Mugshot, Probe: Mugshot, N=12000000; Gallery: Visa, Probe: Kiosk, N=1600000; Gallery: Border, Probe: Border  $\Delta T \geq 10YRS$ , N=1600000; and Gallery: Mugshot, Probe: Mugshot  $\Delta T \geq 12YRS$ , N=3000000  
 IREX 10: Identification Track(Sept 2022) Achieved No.1 ranking in 3 categories: Two-eye Accuracy, Single-eye Accuracy, Rank Accuracy.

Press released November 2024



## Goals of the Biometrics and Video Analytics Business

From individual identity verification to understanding and optimizing individuals, taking into account their surroundings and background, and furthermore, we aim to make personal life more convenient through data linkage and future predictions.



\*Customer Experience

# Contributions to existing businesses through global No.1 technologies

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## Participation in COP29\*1 (Climate change countermeasures through communications and AI)

Adaptation to climate change is one of the main themes at COP29. NEC introduced a specific case study of adaptation efforts combining communications and AI.



CTO Nishihara speaks at UNFCCC / MIC Japan Pavilion Seminar

Consideration of climate change adaptation is progressing worldwide. The key issue going forward is the specific implementation of adaptation measures.

**Investment in Climate Change Solutions by 2030**  
**6.7 trillion dollars\*2**

**Contribution to adaptive measures through analytical techniques using AI**

\*1 COP United Nations Climate Change Conference

\*2 United Nations Framework Convention on Climate Change UNFCCC UNEP/UNDP estimates

## Satellite image analysis x LLM to quickly assess the damage around the world

Exhibit

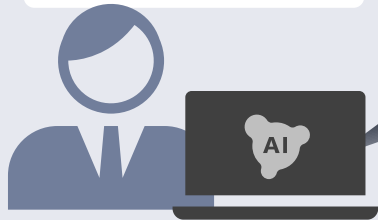
Changes can be analyzed over wide areas using pre- and post-disaster images, enabling interactive, detailed damage assessments for each household

- By combining topographical observation data with land and building information, it is possible to predict disaster risks on a global scale.  
⇒ Simulations visualize the effectiveness of disaster prevention and adaptation strategies for municipalities and companies, as well as support the development of financial products.

### Quickly assess large areas

Identify the areas with the most significant damage

Gather on-the-ground information from social media



### Present the hardest-hit areas, supported by evidence

**SAR Demo**

XX Town is the most damaged area because it has the highest numbers of changes detected.  
District name : XX Town  
Number of households : 20  
Population : 50

Show images taken from social media of this area.  
View SNS images of ZZ Town South.

Display social media images linked with geolocation data

### Evaluate damage conditions

Provide details about damaged homes and the extent of damage

Generate a report detailing the damage



### Detect damaged houses and rank them based on the extent of damage

**Property Damage Analysis using Satellite Images**

Image	Damage Information	Damage Assessment
	<p><b>Structure:</b> The part of the roof and walls are collapsed. <b>Roof:</b> Large sections of the roof is missing or destroyed. It is damaged by scattered materials. <b>Debris:</b> Large sections of the roof is missing or destroyed. It is damaged by scattered materials. <b>Lawn:</b> There are debris scattered around the property.</p>	<p><b>Damaged - level: 5</b> <b>Explanation:</b> The house has significant roof and structure damage, with substantial debris. It shows that the house is not safe for occupancy.</p>
	<p><b>Structure:</b> The part of the walls are collapsed. <b>Roof:</b> It is damaged by scattered materials. <b>Lawn:</b> There are debris scattered around the property.</p>	<p><b>Damaged - level: 4</b> <b>Explanation:</b> The house has significant structure damage, with substantial debris. It shows that the house is not safe for occupancy.</p>

Query: Show detailed report of the damage

Response: Display the damage and assessment information (see below)

Generate textual reports from images



## Examples of Earth Visualization Applications

Value creation in diverse areas such as disaster prevention and mitigation and carbon neutrality is expected.



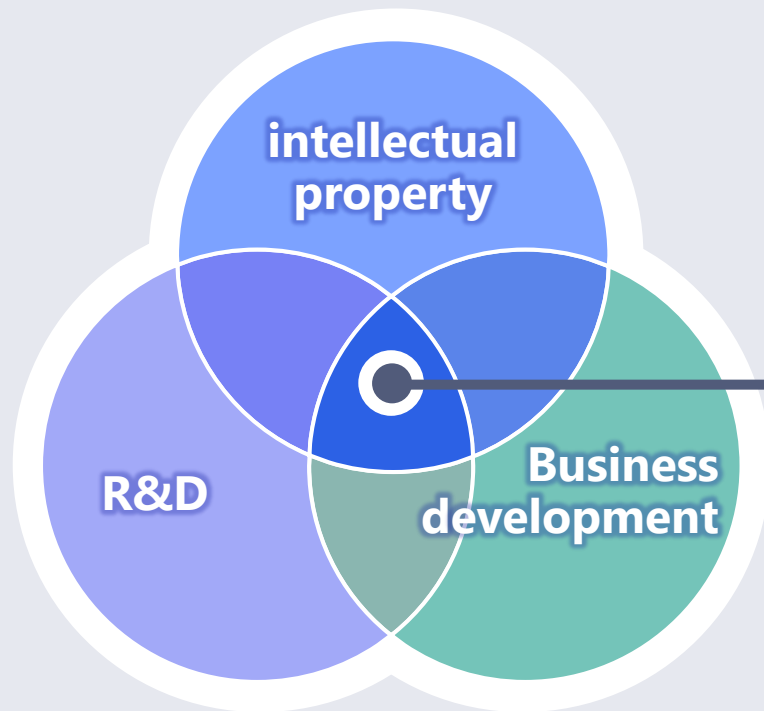


# Creation of new growth businesses

1. Expanding the intellectual property licensing business  
(including AI drug development business)
2. Progress in various new businesses

## Aiming to expand revenue opportunities from diverse intangible assets

Expand revenues by combining advanced technology x business development x intellectual property know-how



### Patents for existing businesses

We proactively strengthen patents on **NEC's core technologies, licensing them across various industries** to drive revenue growth.

### North America Startups

Our innovative business model being promoted by NEC X in North America offers intellectual property to **startups and major companies, accepting equity or licensing fees** as compensation.

### AI drug development

**Utilizing AI**, we accelerate the provision of new drugs, achieving faster and more cost-effective results compared to traditional methods.  
**(Drug discovery business is an IP licensing business)**

### Advanced Technology Consulting Services

We are launching a **high-level consulting service** that will capitalize on **researchers' expertise**, transforming intangible intellectual assets into valuable insights for customer R&D.

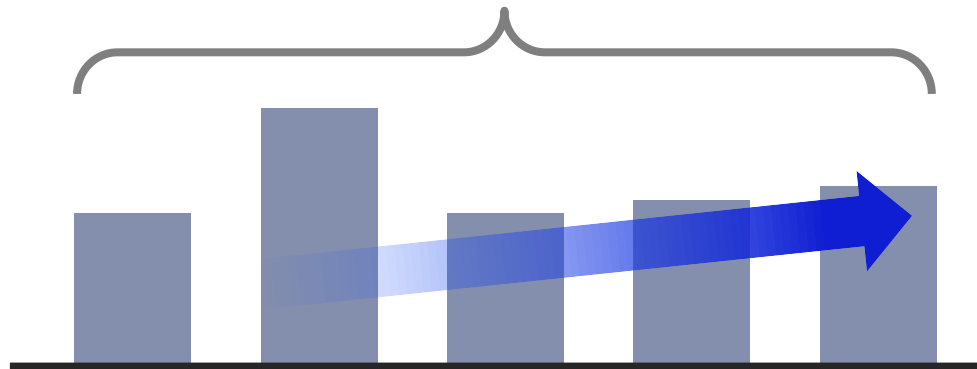
## Toward sustainable and stable patent revenues

- The opportunities to utilize NEC patents have significantly increased, resulting in patent revenues more than doubling in the current mid-term plan (FY21-25) compared to the previous five years.
- The upcoming mid-term plan aims to stabilize revenues across fiscal years by Strengthening the external relations function and implementing patent pool subscriptions.

### Patent revenue (The height of the bars in the graph height is just an image)

#### Ongoing mid-term plan period (FY21-25)

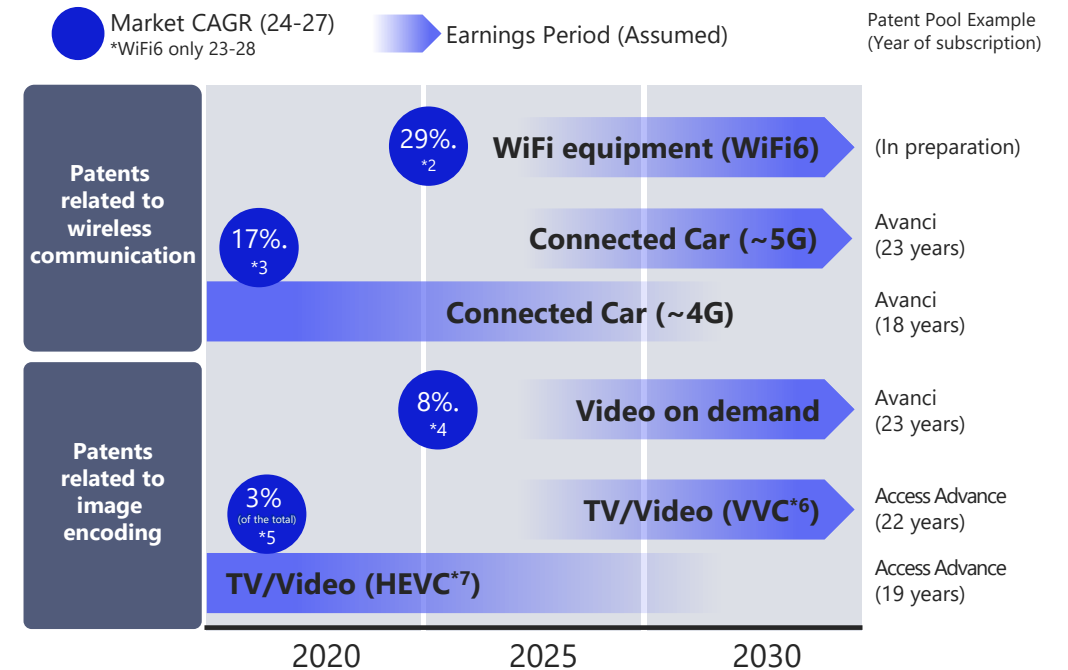
The cumulative progress over the past five years has more than doubled compared to the previous year.



To secure sustainable patent revenues during the upcoming mid-term plan period, we will continue strategic patent filings (5G SEP\*1 market share)

\*1 Standard Essential Patent

### Expanding opportunities to utilize NEC patents (Example)



\*2 Global Information, Inc.

\*3 Statista <https://www.statista.com/statistics/725025/connected-cars-global-market-size-projection/>

\*4 Statista <https://www.statista.com/outlook/dmo/digital-media/video-on-demand/worldwide>

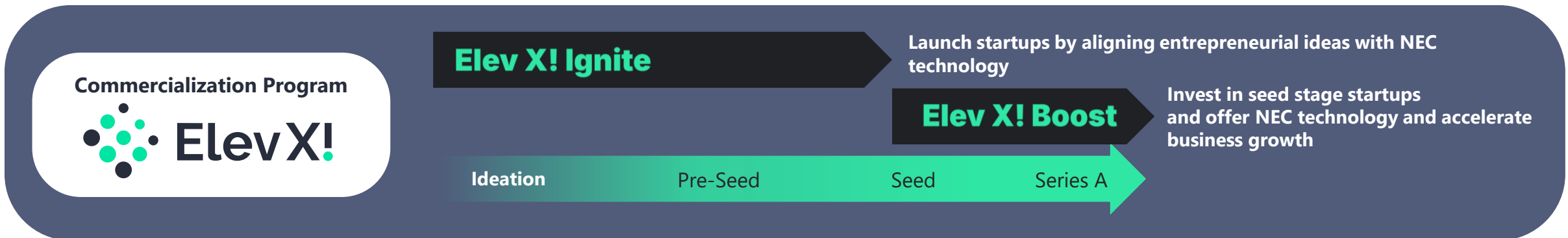
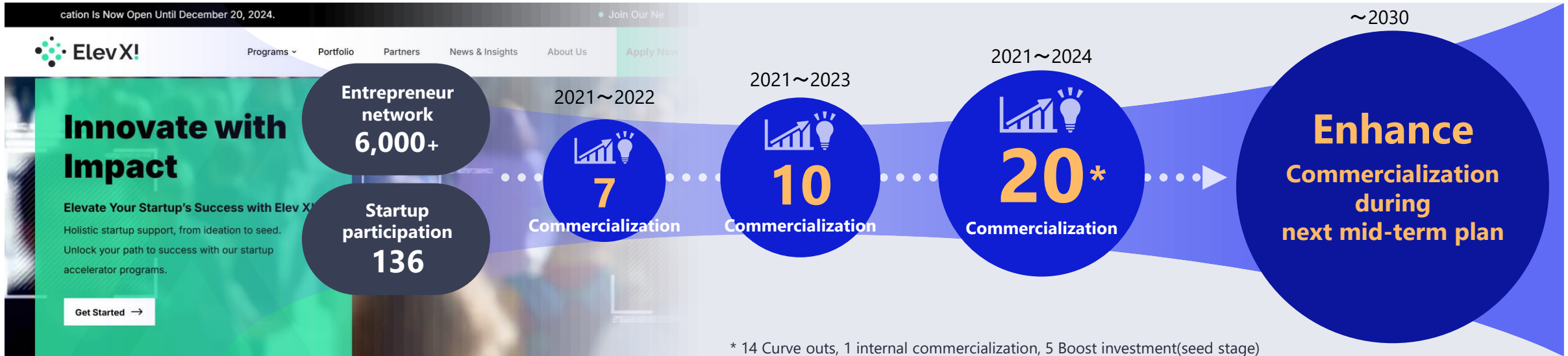
\*5 Statista <https://www.statista.com/outlook/amo/media/tv-video/worldwide#revenue>

\*6 Versatile Video Coding

\*7 High Efficiency Video Coding

# NEC X

We are establishing a business model that provides NEC's intellectual property licenses to North American startups and major companies, in exchange for equity and licensing fees. Our goal is to successfully launch this business and pursue further expansion.



## AI drug development : New licensing business

Providing solid value through verification from AI-driven drug design to clinical trials. This approach has led to a sustainable licensing business model starting from the completion of pre-clinical trials or Phase II.

### Drug discovery in NEC

Over 20 years of experience in AI-driven pharmaceutical R&D  
(Amendment of Articles of Incorporation in 2019)

Acquisition of clinical development functions  
(Acquired through M&A in 2019)

First IT company to secure funding from SCARDA\*(2023)

### Business potential of AI drug development



Licensing Fee     



\* Strategic Center of Biomedical Advanced Vaccine Research and Development for Preparedness and Response

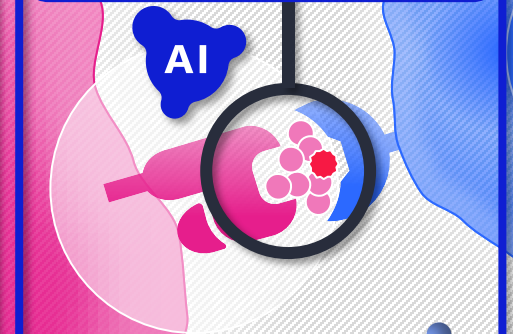
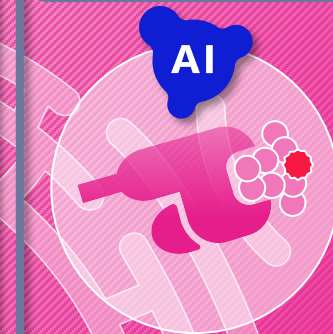
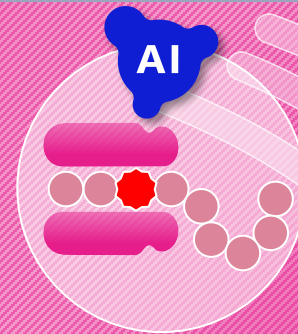
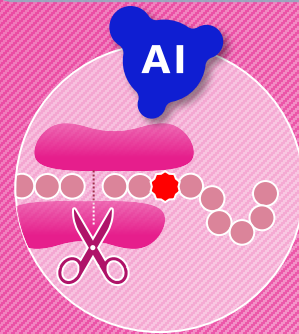
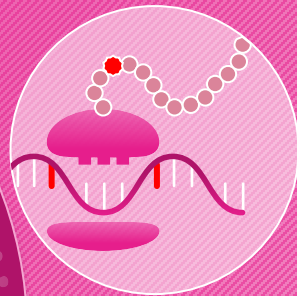
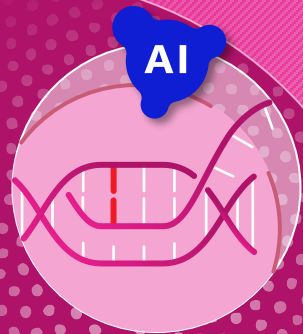


## AI drug development: NEC's strengths in cancer immunotherapy

**NEC's uniqueness in using AI for the entire antigen presentation process.  
We achieve unparalleled accuracy, as validated by clinical trials.**

**NEC employs AI end-to-end (①⇒⑥)**

### Advanced integration process utilizing Graph AI



\*HLA : Human leukocyte antigen

# AI drug development : New Results Announced

Announced on  
November 8, 2024

## NEC has demonstrated its capability in design personalized cancer vaccines by utilizing its proprietary, cutting-edge AI technology.

### Personalized neoantigen cancer vaccine TG4050 for head and neck cancer

Transgene and NEC presented 24-month median follow-up data from the ongoing randomized Phase I trial, at SITC 2024

Immune response to  
head and neck  
cancer

**Without  
treatment**  
A **30 %**  
recurrence rate  
is expected

**TG4050  
Vaccinated**  
Remained  
recurrence-free  
for **24 months**



The promising results from the Phase I clinical trial have led to a transition into a Phase II clinical trial.

# Creation of new growth businesses

1. Expanding the intellectual property licensing business (including AI drug development business)
2. Progress in various new businesses

## New Businesses to Support Next Growth

# Steady progress toward achieving the 2025 Mid-Term Management Plan

Exhibit

data analysis

## Data Driven DX/dotData

Providing dotData, human resource education services, consulting services, etc.

In the six years since its launch in 2018 through last fiscal year High growth of 88% CAGR

Healthcare and Life Sciences

## Fornes Visuas

Visualize future disease risk and health status with AI technology, Providing measurement and testing services to improve lifestyle habits

- Measurement service: Orders received from 9 major Japanese pharmaceutical companies
- Inspection services: Promote local government collaboration and overseas expansion

digital finance

## Financial Services

Asset Formation Advice and Financial Products Brokerage and sales of financial Products

Capital alliance with Japan Asset Management Co.

SaaS

## SaaS Presto

Providing world-proven SaaS Established through a strategic collaboration

between NEC and Vista Equity Partners as an operating company specializing in SaaS

agriculture

## AgriTech

Achieving Sustainable Agriculture through AI Farming

Developing global markets through a strategic partnership agreement with Sumitomo Corporation



# Summary



# Overview of NEC's Innovation Creation

## Competitive Advantage in Current Businesses

System Integration by AI Agents, expanding the market by the new biometric authentication implementation technology, contributing to carbon reduction through satellite vision AI, and taking advantages of communication technologies to keep our competitive advantages in the current business.

## Creation of Next Growth Businesses

With taking advantages of our intellectual properties to new business models, we are to achieve the business value of 300 billion yen in FY2025. We aim to contribute to 10% of the profits in the next medium-term management plan by next growth businesses.


Research & Development



Intellectual Property Activities



New Business Development

A photograph of a modern city park. In the foreground, there is a paved path that curves around a small pond. The pond reflects the surrounding greenery and the tall buildings in the background. The park is lush with green grass, trees, and shrubs. In the background, several tall, modern skyscrapers with glass facades rise against a clear sky. The overall scene is bright and sunny, suggesting a pleasant day in an urban environment.

**Guided by our technology vision,  
we strive to identify technology breakthroughs,  
and drive innovation through  
research and development  
intellectual property activities, and  
new business development,  
thereby creating new social value.**