One NTT DATA

Sustainability Report 2023

Case Book

NTT DaTa
Trusted Global Innovator

Realizing a Sustainable Future

We at NTT DATA aim to foster a sustainable society together with our clients by creating value for the future and connecting various people through technology.

To ensure the sustainability of the planet, the global community must unite in combating climate change, creating circular economies, and restoring ecosystems. In addition, it is the responsibility of global corporations to strive for a society where everyone can live healthy and fulfilling lives by respecting the rights of diverse individuals and ensuring equal access to essential services for all.

In the NTT DATA Group, we actively implement sustainability management, which is central to our medium-term management plan, with the aim of generating both economic value and social value. This approach is anchored on three pillars—Regenerating Ecosystems, Clients' Growth, and Inclusive Society—complemented by nine material issues, all under the slogan "Realizing a Sustainable Future."

In this Sustainability Report 2023 Case Book, we showcase some of the businesses contributing to the sustainability initiatives we are prioritizing. Under a globally unified promotion structure, we intend to accelerate our efforts to preserve the global environment and address social challenges.

President and Chief Executive Officer,
Representative Director,
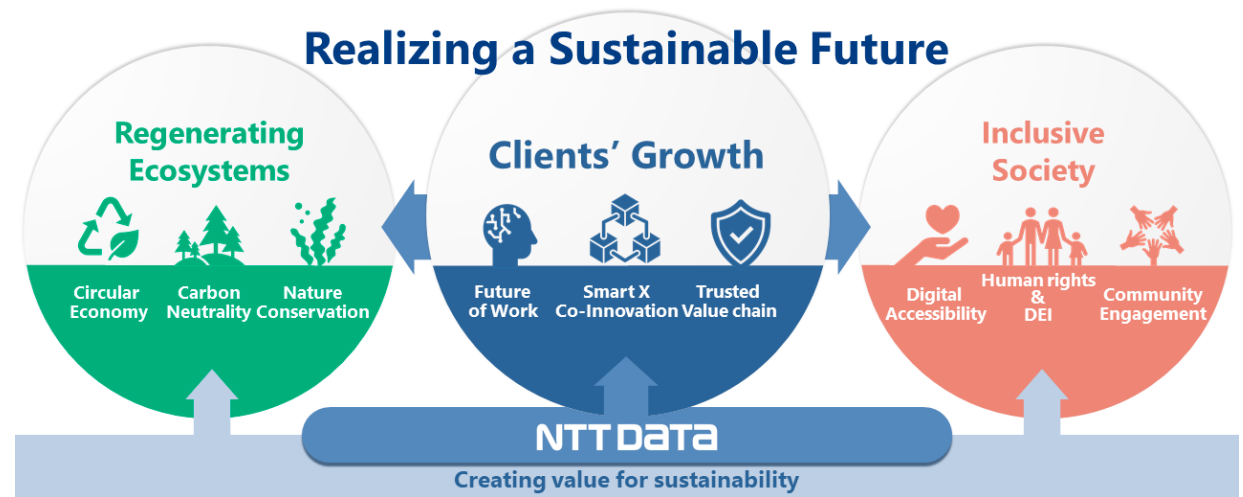NTT DATA Group Corporation

Yo Honma

Sustainability Management in NTT DATA

As per the medium-term management plan (FY2022–2025) (hereinafter the current medium-term management plan), NTT DATA aims to create value for the future and work toward achieving a sustainable society alongside customers by connecting various people through technology.

Alongside shifting environmental dynamics such as population concerns, climate change, and rising disaster risks, the widespread adoption of IT and digital technologies has catalyzed transformations in societal trends. These changes impact not just corporate operations but also consumer behavior and lifestyles. Consequently, the challenges and demands that companies must confront have grown more intricate and varied. We view this period of significant change as an opportunity for further growth and have established the following three axes under the slogan "Realizing a Sustainable Future" to expand our previous efforts in ESG management and promote sustainability management with a long-term perspective.

Realizing a Sustainable Future

Regenerating Ecosystems
- Circular Economy
- Carbon Neutrality
- Nature Conservation

Clients' Growth
- Future of Work
- Smart X Co-Innovation
- Trusted Value chain

Inclusive Society
- Digital Accessibility
- Human rights & DEI
- Community Engagement

NTT DATA Creating value for sustainability

Nine Material Issues

NTT DATA has identified three material issues under each of the following three axes in an effort to contribute to the SDGs.

· Regenerating Ecosystems
(Preserving the global environment for the future)

· Clients' Growth
(Companies achieving growth in ways that support a sustainable society)

· Inclusive Society
 (Achieving a society where everyone can live healthy and happy lives)

NTT seeks to shape a sustainable society together with our clients by creating value for the future and connecting diverse people through technology.

Environment — Regenerating Ecosystems
Preserving the global environment for the future

Carbon Neutrality
Contribute to solving climate change issues by creating innovations to decarbonize society and clients.

Circular Economy
Reduce waste and create a society where the value of products and services continues to circulate.

Nature Conservation
Generate sound global environment and contribute to people's well-being by conserving and recovering nature capital.

Economy — Clients' Growth
Companies achieving growth in ways that support a sustainable society

Smart X Co-innovation
Create new value through co-creation with various companies to achieve a smart and innovative society.

Trusted Value Chain
Uphold data privacy and security to ensure safe, secure and resilient corporate activities.

Future of Work
New ways of working that enhance employee experience and performance. Provide and promote work style reforms for society as a whole.

Society — Inclusive Society
Achieving a society where everyone can live healthy and happy lives

Human Rights &DEI
Work to create an equitable society where a diverse range of people thrive and respect each other's human rights.

Digital Accessibility
Deliver services that provide everyone with equal access to basic needs and improve people's quality of life.

Community Engagement
Understand the challenges and needs for the development of local communities and provide services that enrich people's lives.

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Regenerating Ecosystems

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C-Turtle®

Sharing Emission Reduction Efforts in the Supply Chain Toward Decarbonization

Carbon Neutrality

Smart X Co-Innovation

SOCIAL ISSUES
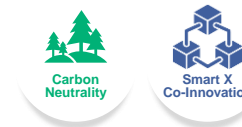
· When greenhouse gas (GHG) emissions increase excessively, global warming progresses, leading to rising sea levels, abnormal weather patterns such as heavy rainfall and droughts, ecosystem collapse, and consequent threats to people's livelihoods due to water and food shortages.

13 CLIMATE ACTION

17 PARTNERSHIPS FOR THE GOALS

In pursuit of decarbonization, companies are urged to calculate and disclose not only their own GHG emissions (Scope 1 and 2[1]) but also those from other companies related to their activities (Scope 3). However, calculating Scope 3 emissions poses challenges due to methods hindering visualization of companies' reduction efforts, alongside the costs and operational requirements of data collection.

At NTT DATA, we have developed and offer the GHG visualization platform, C-Turtle®, which utilizes primary data (actual measurement data), including CDP[2] data, to achieve calculation based on the Company-wide Emission Allocation Method, aiming to promote emission reduction throughout the entire supply chain. We also established a system for providing free access to SMEs—a significant portion of the supply chain—supporting activities to improve emission visualization accuracy and foster reduction efforts in society.

In addition to deployments in manufacturing and distribution, we have been expanding our reach in the financial sector since July 2023.

In February 2024, we began implementation in the NTT Group, and we plan to gradually expand collaboration with suppliers on reduction efforts to around 1,000 companies by fiscal 2027.

Corporate-wide emission visualization

C-Turtle®

The C-Turtle® platform is compliant with the Company-wide Emission Allocation Method and can visualize Scope 3 GHG emissions that could be reduced.

Visualization

C-Turtle FE

C-Turtle FE provides a GHG emission calculation service compliant with the PCAF Standard for financial institutions' investment and lending destinations.

Emission visualization by product/service

C-Turtle ForeSus

C-Turtle ForeSus supports dual-wheel management of sustainability and profitability, providing an automatic calculation foundation for product-specific carbon footprints.

Reduction

C-Turtle®

C-Turtle® is compatible with a hybrid calculation method combining the Scope 3 calculation with product-specific CFP.

Corporate value Product value / Value proposition

Conceptual diagram of C-Turtle®

Emission reduction rate achieved through C-Turtle® implementation

70%

Notes:
1. Scope 1: Direct emissions from sources such as the use of fuel
Scope 2: Indirect emissions from the use of purchased electricity and heat
Scope 3: Other indirect emissions throughout the supply chain (excluding Scope 1 and 2)
2. CDP is an international NGO operating a global information disclosure system for greenhouse gases.

[Click here for reference article](#)

[Click here for reference article](#)

Sustainability Data Manager

Managing Material Properties Data to Prevent "Greenwashing"

Carbon Neutrality

Circular Economy

SOCIAL ISSUES

· While society sees a surge in sustainability-related products, companies are increasingly required to provide accurate supporting information to prevent "greenwashing."

7 AFFORDABLE AND CLEAN ENERGY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

17 PARTNERSHIPS FOR THE GOALS

Companies are increasingly expected to expand the release of sustainability-related products while ensuring proper compliance with numerous related laws, highlighting the need for effective data management. Despite this, many companies still rely on manual data management, posing challenges in streamlining operations and preventing human error.

NTT DATA Business Solutions has initiated a joint project with clients to address this challenge. We have developed a centralized database model capable of storing approximately 1,000 materials, with 160 attributes each, equipped only with essential functions.

This facilitates targeted traceability and collaboration with relevant stakeholders through the database.

Integration with the SAP Material Master enables various simulations, including carbon footprint calculations, chemical component management, and more, at the product level, component level, and component structure level.

Efforts will be made to expand functionality going forward, such as calculating the CO_2 emissions of products, thereby contributing to the development and market distribution of sustainable products for companies.

Types of data

Approx. **16,000**

CO₂ data processing:
· Calculation of the CO_2 footprint in Excel, BW systems, SAP PFM. etc.
· Simulation of product variants
…

Planned Features

Product Simulation

Carbon Footprint Calculation (BW, Excel, …)

…

Daten Export

Maintenance view:
Customer-specific maintenance view for mass maintenance of relevant data for CO₂ calculation in SAP. The data is used for subsequent processing and distribution to surrounding calculation and analysis systems for the carbon footprint using the DATA extractor.

Current Features

Maintenance Master Data

Data Extractor Interface Carbon Footprint (API)

Master Data Tables Carbon Footprint

SAP

Extractor:
The extractor provides an interface via a defined API to read out relevant master and transaction data for the calculation of the carbon footprint in related calculation tools.

Data Model:
The data model ensures the aggregation of relevant master data, which are necessary for the subsequent calculation of the carbon footprint.

Conceptual diagram of the database model

[Click here for reference article](#)

Where There's a Willforce, There's a watt !

Advancing Eco-Friendly Software Ensuring Security with Minimal Energy Consumption

SOCIAL ISSUES

· As software becomes more advanced and complex, power consumption is increasing proportionally, and there is growing demand for energy-efficient development practices.

Efficiency in both performance and energy usage is crucial in the coding of software. Securing data, in particular, involves extensive processing tasks, making it essential to design systems that reduce CPU load and minimize energy consumption.

In Germany, the Federal Office for Information Security (BSI) promotes domestic information security and introduces security requirements. Compliance with new BSI requirements involved the replacement of digital certificates with longer bit key lengths, approximately twice the original size, resulting in a twofold increase in CPU load and a significant rise in power consumption.

To address this, BSI collaborated with the Network Operations Center and Security Center of NTT DATA Business Solutions to efficiently modify the digital signature algorithm. This served to greatly reduce CPU load while still meeting BSI requirements, leading to energy reduction equivalent to more than 1,400 kWh annually—approximately half the annual consumption of a German household—across two servers.

This approach can be extended to various software solutions, fostering efficiency not only in performance

but also in energy usage, and contributing to a reduction in power consumption.
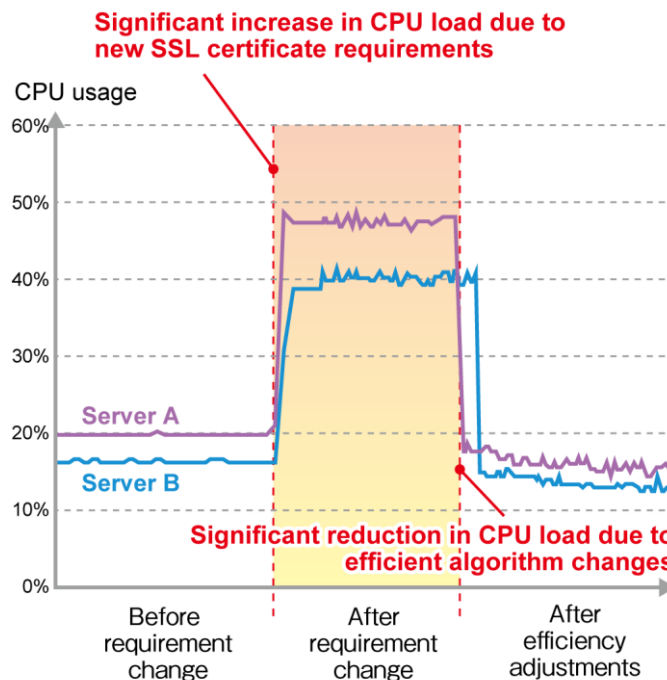
CPU load of two monitoring servers

CPU utilization after optimizing the digital algorithm

Cut by 33 percentage points
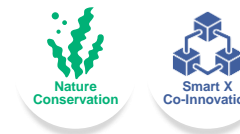
Reduced from 47% utilization pre-optimization to 14% post

[Click here for reference article](#)

Green Nudging
The Wadden Sea Project

Using AI Chat to Propose Eco-Friendly Tourism, Preserving World Natural Heritage Ecosystems

Nature Conservation

Smart X Co-Innovation

SOCIAL ISSUES

· The International Union for Conservation of Nature (IUCN)'s "Red List" (a list of endangered wildlife species worldwide) indicates 44,000 species are at high risk of extinction.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

The Wadden Sea, spanning the Netherlands, Germany, and Denmark, is the world's largest tidal flat and a UNESCO World Heritage site. Its environment, characterized by the daily cycle of tides flooding and ebbing, fosters diverse ecosystems, attracting numerous migratory birds and supporting a wealth of flora and fauna. However, in recent years, environmental pollution and overexploitation have led to the degradation of its ecosystems.

NTT Data Business Solutions is collaborating with conservation groups focused on the Wadden Sea and Microsoft, which provides generative AI, on a project aimed at guiding visitors to the Wadden Sea to engage in ecologically responsible tourism activities.

Through AI chat, visitors are provided with valuable information and guidelines for ecological conservation, promoting voluntary actions (green nudging). In addition, efforts are under way to analyze the information stored in the data platform, consider IoT sensors to measure visitor behavior, and enhance the quality of Q&A interactions through AI learning.

Plans are in place to continue the project, promoting the conservation of the Wadden Sea ecosystem and

exploring expansion into other industries such as smart buildings.

Photo: Rudmer Zwerver via Shutterstock

Number of wild animal species listed in the International Union for Conservation of Nature (IUCN) Red List

44,000

[Click here for reference video](#)

THEROS

Ensuring Origin and Quality for the Safe Distribution of Food

Carbon Neutrality

Circular Economy

SOCIAL ISSUES

· The food system, encompassing production, processing, transportation, and consumption, is well established, enabling widespread global distribution. However, issues such as food fraud, food loss, and environmental impact have emerged.

3 GOOD HEALTH AND WELL-BEING

8 DECENT WORK AND ECONOMIC GROWTH

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

To establish a sustainable food system, it is imperative to consider factors such as environmental conservation, animal welfare, circularity, and adaptation to organic practices throughout the supply chain. In the EU, a labeling policy is being promoted to safeguard the origin and traditional production methods of products that meet these criteria. However, these high-quality labeled products are often susceptible to counterfeiting issues such as misuse, tampering, and adulteration with different ingredients, posing challenges in ensuring transparency in traceability.

In response, the EU is advancing the THEROS Consortium to enhance transparency in the food supply chain. NTT DATA Spain is participating in its pilot project along with the consortium's 17 partners.

For this, we provide a Digital Product Passport to guarantee origin and quality and are developing a tool to verify the label and origin of specific products. This tool utilizes blockchain technology with machine learning and artificial intelligence based on Earth observation, photonics, IoT, and DNA authenticity methods, ensuring high versatility and cost-effectiveness while aiding in fraud prevention. In Spain, it is being used to protect the production and trade of Galician mussels.

In 2024, a pilot project will be conducted in EU countries, and the results will be used to expand functionality and develop marketing activities.

Conceptual diagram of THEROS

Range of monitorable organic farming plots

1,000㎡
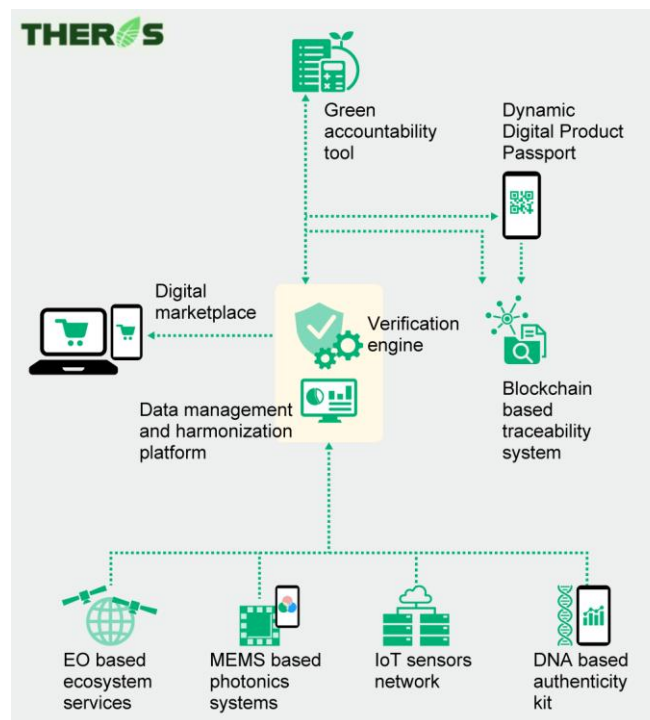
[Click here for reference article](#)

[Click here for reference video](#)

VALU-ES

Visualizing Dependency on Natural Capital for Utilization in Conservation Strategies

Nature Conservation

SOCIAL ISSUES

· Natural capital, comprising forests, soil, water, air, biodiversity, and biological resources, underpins both business operations and people's livelihoods. However, the depletion of natural capital due to recent development and climate change poses significant concerns regarding its impact on economic activities.

11 SUSTAINABLE CITIES AND COMMUNITIES 13 CLIMATE ACTION 14 LIFE BELOW WATER 15 LIFE ON LAND

In the 20-year period from 1980, an estimated 100 million hectares of tropical rainforest were lost primarily due to the expansion of cattle ranching in South America and plantations, including those for palm oil in Southeast Asia. This loss has had significant repercussions on the ecosystems of flora and fauna, and the natural capital taken for granted until now is being threatened. Consequently, companies and organizations are required to assess and analyze their opportunities and risks concerning their dependency on natural capital and to calculate and disclose the financial impact accordingly.

NTT DATA Spain has been engaged in a project focusing on natural capital accounting, which involves appropriately assessing and managing the value of natural capital over many years. Drawing from the expertise accumulated through this endeavor, we developed the natural governance solution system, VALU-ES. By digitizing natural capital accounting, dependency can be visualized, helping to provide guidelines for informed decision-making regarding natural capital and leading to the development of cost-effective conservation strategies. In addition, it allows for the integration of natural capital considerations into financial statements and rationalizes reporting tasks.

Currently, the team is providing services to companies and public institutions involved in natural resource development and natural capital, particularly in Latin America and other regions, and exploring opportunities with multilateral institutions such as the World Bank.
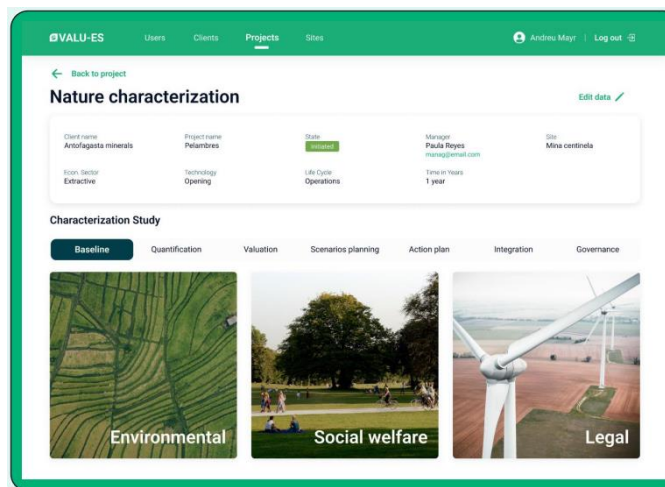
VALU-ES interface

Tropical rainforest lost over 20 years

Approx. **100 million hectares**

[Click here for reference article](#)

[Click here for reference video](#)

CO2Sink

Enhancing Carbon Credit Quality Through AI-based Forest Management and Monitoring

SOCIAL ISSUES

· Measures to encourage companies to reduce carbon emissions are needed to achieve greenhouse gas emission reduction targets.

· Carbon pricing involves assigning a price to emitted carbon and imposing economic burdens on companies and is being widely adopted worldwide to promote emission reduction efforts and transition to renewable energy sources.

One method of carbon pricing, emissions trading, involves the buying and selling of CO_2 emission allowances in the market. The demand for carbon credits* utilized in emissions trading is steadily increasing. Given that forests absorb roughly 30% of Earth's total CO_2, they are poised to experience heightened demand as sources of carbon credits.

NTT DATA Italia has developed a new method called CO2Sink to measure and monitor forest carbon based on AI technology and scientific standards, aiming to enhance trust in forest-derived carbon credits in the market. Using Light Detection and Ranging (LiDAR), laser light is emitted to measure forest characteristics

such as shape based on reflected light information, enabling the classification of vegetation and trees. Furthermore, it gathers information on the temporal changes in vegetation characteristics, allowing for the estimation of resource quantities through AI modeling.
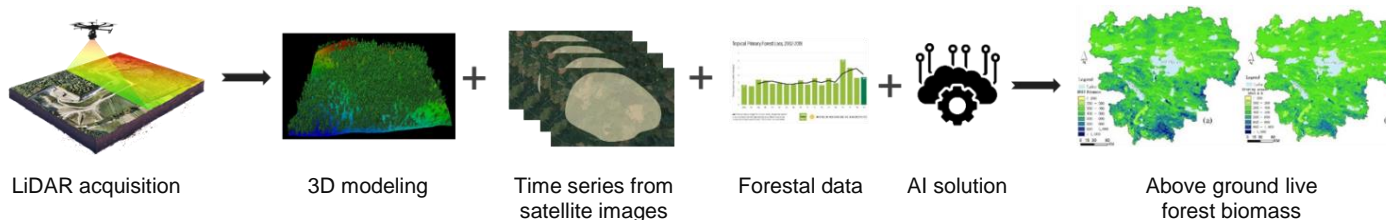
Efforts are under way to obtain certification from Verra, a leader in voluntary carbon credit certification, while also enhancing accuracy and transparency. This involves utilizing ISO 14060 for the quantification, monitoring, reporting, and verification of CO_2 emissions and removals. These endeavors contribute not only to the management of forests and land use but also to the activation of the CO_2 emission trading market.

Forest area in Calabria, Italy, where real-time CO_2 absorption can be measured

5,600 hectares

*Carbon Credit:
Carbon credits are a mechanism for quantifying the reduction or absorption of greenhouse gas emissions, such as CO_2, into credits, which can be traded primarily among companies.
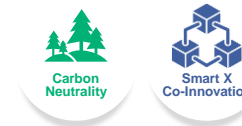

LiDAR acquisition → 3D modeling + Time series from satellite images + Forestal data + AI solution → Above ground live forest biomass

Conceptual diagram of CO2Sink

Sustainability of NTT DATA's Data Centers

Pursuing Data Center Sustainability by Optimizing Energy Efficiency

Carbon Neutrality · **Smart X Co-Innovation**

SOCIAL ISSUES

· Growing demand for cloud services is driving growth in the number of data centers worldwide.
· Data centers consume large amounts of electricity to keep servers running continuously, accounting for 1–1.5% of the world's electricity consumption.

7 AFFORDABLE AND CLEAN ENERGY · **8 DECENT WORK AND ECONOMIC GROWTH** · **9 INDUSTRY, INNOVATION AND INFRASTRUCTURE** · **13 CLIMATE ACTION**

Efforts to reduce power consumption and save energy are under way for our data centers, which account for approximately 70% of NTT DATA's power usage.

The data center (DC2) in the heart of Berlin, Germany, has implemented efficient cooling technology, a power management system, and energy-saving measures. Preparations are also under way with local authorities to supply excess heat to neighboring areas, helping reduce the region's environmental impact. Moreover, the data center in Bautzen (DC4) is operated using electricity from 100% renewable energy sources, including solar power. It utilizes adiabatic cooling, which relies on steam generated from rainwater to cool without requiring compressors, even when the outside temperature surpasses room temperature, thereby reducing greenhouse gas emissions. Also, the heat emitted by servers is repurposed for building heating.

Mitaka Data Center EAST in Japan boasts state-of-the-art environmental performance, being one of the largest and most advanced facilities domestically, with its electrical efficiency ranking among the top nationwide. The next-generation cooling system, known as "immersion cooling," is employed by submerging IT equipment in an insulating liquid, achieving efficient

cooling. Through operational verification, energy usage for data center cooling has been reduced by up to 92% compared to conventional data centers.

We will continue pursuing data center sustainability, ensuring system safety and security while reducing environmental impact, including energy efficiency initiatives, as a leading company in the field.

Bautzen DC4

Pursuing Data Center Sustainability by Optimizing Energy Efficiency
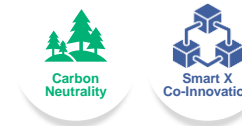
100%

[Click here for reference article](#)

E-mobility Data Platform

Contributing to Singapore's EV Adoption Via Data Management and Analysis of Charging Facilities

Carbon Neutrality

Smart X Co-Innovation

SOCIAL ISSUES

· While transition from gasoline cars to EVs with lower CO_2 emissions is progressing worldwide, challenges such as vehicle prices and inadequate charging infrastructure hinder the spread of EVs in some regions.

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

Amid the global priority to reduce CO_2 emissions, the Singaporean government has set a policy to transition all domestically registered vehicles to environmentally friendly options by 2040. It also aims to promote the installation of 60,000 public electric vehicle (EV) charging points (EVCPs) by 2030. To promote the widespread deployment and usage of EVCPs, it is important to comprehend information such as the EVCPs' locations, electricity demand-supply dynamics, and vehicle movements.

NTT DATA Singapore has established a partnership agreement with EV-Electric Charging Pte Ltd (EVe), specializing in charging facility management. Through this collaboration, NTT DATA offers its cutting-edge EV charging data management and analysis platform, NXT

E-Mobility Data Platform (NXT-EDP), to support EV charging facility promoters, commercial establishments, and residential development authorities. The objective is to enhance the operational efficiency of these facilities.

NTT DATA will leverage this ecosystem to deepen customer relationships through interconnected experiences.

Furthermore, we will prioritize the development of advanced data models to predict customer needs, behaviors, and preferences, and effectively acquire and utilize consumer data for this purpose. We will identify correlations between consumer behavior in various industries such as shopping malls, real estate, and insurance, and work to expand our services.

Percentage of Singapore's domestic registered vehicles to be eco-friendly by 2040 (green policy)

100%
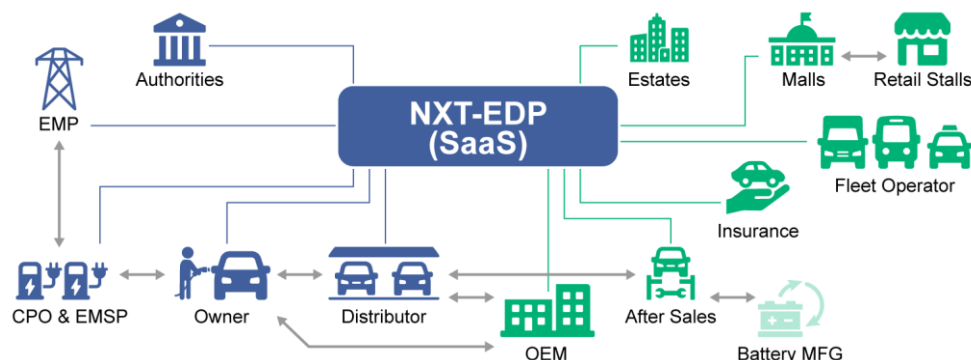
NXT-EDP connects consumers with businesses across industries. Behavioral data collected from EV charging facility usage will be used in the consumption activities of other businesses such as shopping malls, real estate, and insurance.

Key Goals
- Track
- Monitor
- Report
- Forecast
- Planning
- User Experience
- Loyalty Programme
- Improve Customer Services

Click here for reference article

AI-based Recycling Parks

Efficient Waste Collection and Cleaner Cities Through AI-Powered Prediction of Recycling Container Fill Levels

SOCIAL ISSUES

· In Belgian cities, citizens can dispose of waste in "recycling parks," but it poses challenges when containers reach full capacity, such as an unsightly landscape and illegal dumping.

· There are not enough collection workers to handle the amount of waste generated, necessitating improvements in convenience through digitalization.

Belgian cities have around 550 recycling parks where residents can dispose of their garbage in large recycling container bins. However, when these containers are full, it leads to littering in the surrounding areas and even illegal dumping on streets and elsewhere.

NTT Belgium utilizes AI technology for waste container detection and monitoring, reading the fill level of containers in real-time 24 hours a day. By analyzing past data alongside current readings, it predicts the remaining time until the containers are full. This enables prediction of the optimal timing for waste retrieval and collection from the containers, thus preventing overflow and enhancing the convenience for city residents.

It also allows waste collection companies to streamline collection operations by enhancing the precision of waste collection vehicle scheduling. This not only minimizes fuel costs and CO_2 emissions from collection vehicles but also aids in optimizing recycling container collection.

Going forward, we aim to apply this technology to other areas and industries to contribute to improving resource allocation, enhancing operational efficiency, and reducing environmental impact.

Amount of CO$_2$ emission reduction by optimizing logistics

6,132.5t/year

In the case the logistics of one truck were optimized by 5% in each of the 550 recycling parks in Belgium

Before (left) and after (right) improvements at a recycling park

[Click here for reference video](#)

Clients' Growth

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Battery Traceability Platform

Collaborating to Address Eco Impacts of EV Batteries while Ensuring Confidentiality

Smart X Co-Innovation   **Carbon Neutrality**   **Circular Economy**

SOCIAL ISSUES

· As EVs become more prevalent, reducing the environmental impact of their batteries has become a challenge. Alongside reducing CO_2 emissions across the EV battery value chain, there is increasing demand to manage and disclose rare resource use and uphold human rights.

13 CLIMATE ACTION   **17 PARTNERSHIPS FOR THE GOALS**

Electric vehicles (EVs) are considered more environmentally friendly than gasoline cars that use fossil fuels. However, reducing the environmental impact of EV batteries poses a new challenge.

The European Battery Regulation, enacted in August 2023, mandates disclosure to the European Commission of CO_2 emissions and resource recycling rates throughout the battery life cycle. In the future, Japanese companies will also need to comply with battery regulations to sell EVs and other battery-powered vehicles in the European market.

In Europe, initiatives such as Catena-X, led by German automotive manufacturers and IT companies, serve as platforms for companies and organizations to exchange data mutually. However, when Japanese companies engage in data exchange through platforms like Catena-X, concerns arise from an information management perspective. This is because it might involve not only carbon footprint information but also confidential company data, such as the raw materials of automotive components, being stored overseas.

To address this, NTT DATA has teamed up with government and industry stakeholders to demonstrate a secure data collaboration platform that enables cross-industry data exchange while safeguarding only the necessary information. In the future, we aim to expand the platform's usage not only to other industries but also beyond Japan, including in Asia. By doing so, we contribute to achieving a carbon-neutral and resource-circulating society.

Visualization of carbon footprint

100%

*for EV batteries exported from Japan to the EU
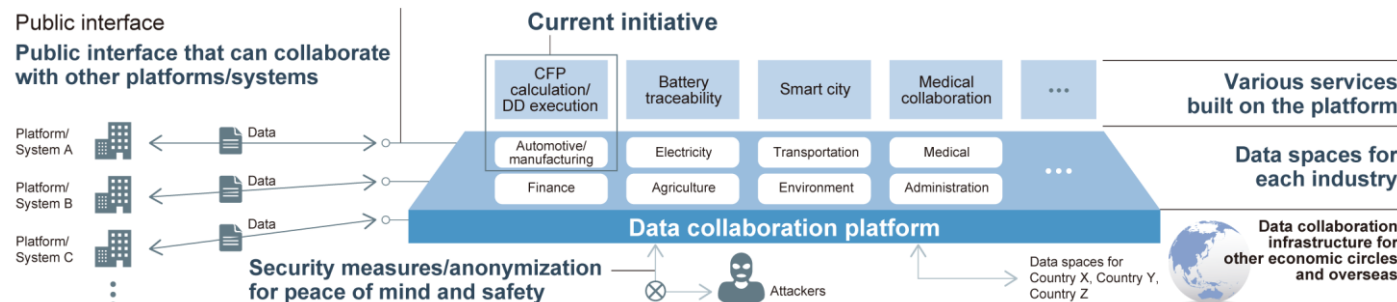
Conceptual diagram of the data collaboration platform

[Click here for reference article](#)

Progmat

Building a Reliable Platform with Blockchain Technology to Revitalize the Digital Asset Market

SOCIAL ISSUES

· The value of everything, from goods to services, has been digitized, leading to an expansion of digital transactions and interactions on online platforms and through cloud usage. However, challenges have arisen concerning security risks such as data leaks and cyberattacks, as well as the complexity of transactions.

With the rise of cryptocurrencies and digital art, there has been a growing interest in "Digital assets*". From finance to art, businesses leveraging digital assets are emerging one after another.

To expand the digital asset market more fully, it is necessary to standardize payments, management, and distribution within transactions, thereby enhancing convenience. In Japan, the revision of the Financial Instruments and Exchange Act in 2020 resulted in legal reforms aimed at enhancing transaction security.

In 2023, NTT DATA, along with seven companies possessing extensive knowledge of the financial market and infrastructure-building capabilities, including Mitsubishi UFJ Trust and Banking Corporation, established Progmat, Inc.

NTT DATA is responsible for developing the infrastructure for issuing and managing digital assets utilizing blockchain technology, as well as operating the Digital Asset Co-creation Consortium, which sets the development direction of the system with the participation of nearly 200 companies (as of March 2023). Crossing the boundaries of traditional corporate groups, NTT DATA aims to contribute to establishing digital assets as a national infrastructure.

Projected size of the tokenized financial/assets market in 2030

US$16.1 trillion

BCG's "Relevance of On-chain Asset Tokenization in 'Crypto Winter'" (December 2022)
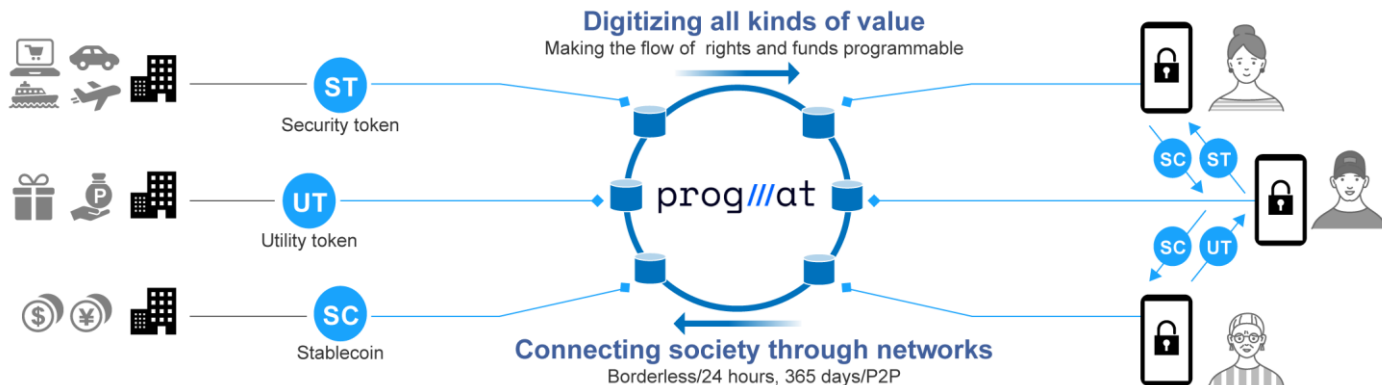
* Digital assets:
Digital data that holds value as assets. This encompasses securities, cryptocurrencies (virtual currencies), coupons, as well as various content and file data such as images, audio data, e-books, and music data.

[Click here for reference article](#)

Digitizing all kinds of value
Making the flow of rights and funds programmable

ST Security token

UT Utility token

SC Stablecoin

prog///at

SC ST

SC UT

Connecting society through networks
Borderless/24 hours, 365 days/P2P

Conceptual diagram of Progmat

TetraBRiDGE®

Digitally Streamlining Operations by Bridging Invoicing and Payments

Smart X Co-Innovation

Future of Work

SOCIAL ISSUES
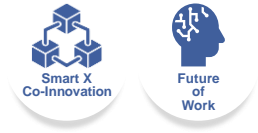
· The declining workforce due to the dwindling birthrate and aging population poses a significant challenge in ensuring labor support for economic activities.
· While digital utilization in administrative tasks within companies is crucial for enhancing productivity, its adoption is lagging.

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

The introduction of the invoicing system and the impending digitalization of promissory notes and checks by 2026 are compelling Japanese companies to transition toward digital invoicing and payment processes. Nevertheless, the streamlining of administrative procedures has not advanced significantly.

NTT DATA's TetraBRiDGE® enables seamless digital processing, from receiving and managing the invoices of multiple electronic invoicing services to completing settlements using transfers from more than 300 domestic financial institutions and electronic record

receivables. This streamlining allows for up to 80% improvement in efficiency in administrative tasks from invoice reception to settlement, reducing errors and strengthening internal controls.

We aim for the platform to be widely utilized through collaboration with numerous financial institutions and electronic invoicing service providers, as well as by expanding into various supply chains. We will also consider providing automatic reconciliation functionality for accounts receivable to companies issuing invoices in the future.

Improvement in operational efficiency through TetraBRiDGE®

Up to **80%**

Seamless digital integration from invoice reception to settlement

Automated receipt and centralized management of various invoices

Unified transactions with multiple financial institutions

Image of TetraBRiDGE® services

Click here for reference article

Click here for reference article

Enhancing User Convenience and Reducing Employee Workload with Checkout-free Shopping

CATCH&GO®

Smart X Co-Innovation

Future of Work

SOCIAL ISSUES

· In Japan, a shortage of labor is emerging due to the declining working-age population. It is estimated that by 2030, there will be a shortage of 600,000 workers in the retail sector, including supermarkets and convenience stores.

(Source: Persol Research and Consulting and Chuo University's "Estimates for the Labor Market in 2030")

The retail and distribution sectors, crucial for daily life, face concerns about store survival. To address this, implementing measures to reduce employee workload, enhance labor productivity, and transition to sustainable store formats is essential.

NTT DATA has developed and provided the digital store operation service, Catch&Go®, to the retail industry. In October 2023, in collaboration with Daiei, the first ground-level walk-through store adjacent to a supermarket was opened in Yokohama, Kanagawa Prefecture. Users scan a QR code displayed on their registered smartphone app at the store gate before entering. The store utilizes cameras to take footage of user movements and weight sensors to detect product selections, which are then analyzed in real time using AI technology. Customers can select from an array of approximately 400 different products and settle their accounts in as little as 10 seconds, bypas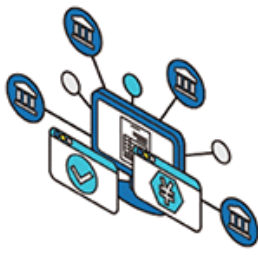sing the checkout counter and simply leaving the store with their chosen items. Meanwhile, real-time data on product dynamics and user movements allow the store to make improvements in product display and layout, leading to enhanced store marketing and waste reduction, ultimately increasing sales.

In addition to addressing issues in the retail and distribution sectors, we aim to enhance user convenience, provide personalized product recommendations, and create new purchasing experiences and store models through digital technology.
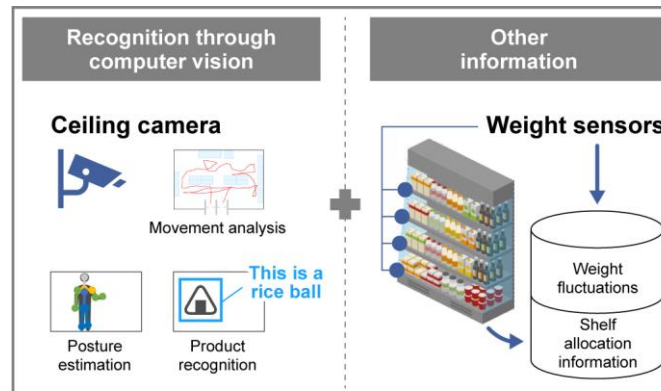
Conceptual diagram of Catch&Go®

Enhancing User Convenience and Reducing Employee Workload with Checkout-free Shopping

600,000

(Source: Persol Research and Consulting and Chuo University's "Estimates for the Labor Market in 2030")
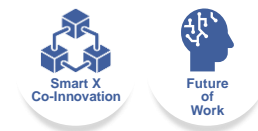
[Click here for reference article](#)

[Click here for reference article](#)

Work Re:Invention

Proposing New Work Styles Leveraging the Benefits of Real and Digital Realms

Smart X Co-Innovation

Future of Work

· In Japan, more than 50% of companies have introduced telework. However, considering the importance of addressing communication and work efficiency issues when opting for a flexible work style, there is a declining trend among companies without telework arrangements, with only 3.5% planning to introduce it in the future.

(Source: 2022 Communications Usage Trend Survey released by the Ministry of Internal Affairs and Communications)

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

With the increasing adoption of telework, a hybrid work model has emerged, offering employees the freedom to choose between telework and office-based work. However, this transition brings about various challenges, including communication among employees, operational efficiency, and ensuring information security. Addressing these multifaceted challenges requires careful consideration and solutions.

NTT DATA has introduced Work Re:Invention, a novel approach to working that integrates cutting-edge digital technologies with the benefits of face-to-face communication. Through this approach, NTT DATA provides services aimed at enhancing productivity for companies and improving employee satisfaction with their work styles.

The BizXaaS Office® service facilitates the balance between work-style reform and security measures by offering a resilient infrastructure rooted in the Zero Trust Network* concept, effectively mitigating security risks.

In addition, we provide services that support the creation of an optimal work environment through the utilization of XR technology–enabled metaverse spaces, where meetings can take place virtually (telework) or in person

(onsite/face-to-face); AI-driven knowledge sharing both internally and externally; and the collection and analysis of data concerning employee health and work situations.

Our service has already been adopted and utilized by at least 10 companies, supporting many employees in achieving autonomous work styles.
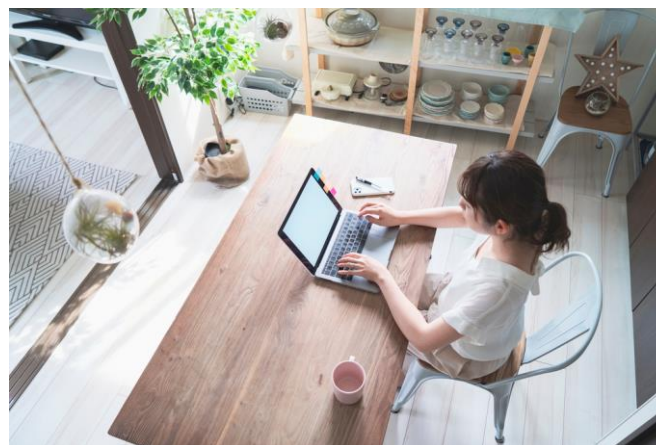
Photo: maruco via Shutterstock

Percentage of companies that have implemented telework

55.2%

(Source: 2022 Communications Usage Trend Survey released by the Ministry of Internal Affairs and Communications)

* Zero Trust Network:
A security framework that builds a security environment on the premise of not trusting any request or traffic, without considering the boundaries between internal and external networks.
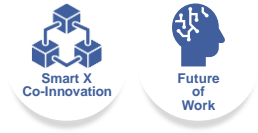
[Click here for reference article](#)

PITON®

Sustainable Financial Transactions Through Open Systems

Smart X Co-Innovation

Future of Work

· The Ministry of Economy, Trade and Industry predicts that failure to address challenges such as the black boxing of outdated systems and the shortage of IT personnel will lead to a decline in market competitiveness, resulting in approximately ¥12 trillion in economic losses annually from 2025.

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

13 CLIMATE ACTION

The withdrawal of domestic mainframe vendors has placed systems, including financial accounting systems, which operate on mainframes, in a critical state where continued operation is no longer feasible. Since the 2000s, NTT DATA has been working on the open transformation of mainframe systems. From 2017, we have assembled experts and steadily addressed technical challenges while embarking on the development of functions as alternatives to mainframes. Following research and development, as well as quality testing, we have commercialized the PITON® framework, which enables business applications running on mainframes to operate on an open platform. As a result, businesses have been able to securely and safely migrate accounting systems running on mainframes, ensuring the continuity of their systems.

Our aim is to consolidate accounting systems using the Integrated Banking Cloud, following the open transformation facilitated by PITON® as the first step. By leveraging open technology for consolidation and automation, it becomes possible to optimize human resources and facility costs through efficiency improvements.

The name PITON®* embodies our commitment to ensuring the security of financial systems, facilitating seamless transition from one person to another, and guiding toward achieving goals. The greatest achievement of PITON® lies not in the development of the product itself, but in its ability to draw out the power of employees to realize the unprecedented challenge of mainframe openness. In the highly uncertain market ahead, employees with transformative capabilities will play a vital role in enhancing competitiveness.

Annual economic losses from 2025 due to decreased competitiveness caused by delays in DX

¥12 trillion

(Source: Ministry of Economy, Trade and Industry's "DX Report," September 2018).

* PITON:
A French term referring to steel spikes driven into rock or ice walls to secure routes in climbing and other activities.

Mainframe

Business Applications (Deposits, Foreign exchange, Loans, Customer management)

Middleware

OS

Hardware

After Application of PITON® Open Framework

Business Applications (Deposits, Foreign exchange, Loans, Customer management)

PITON

Open middleware

Open OS

Open hardware

Utilization of existing assets through rehosting

Utilization of open products
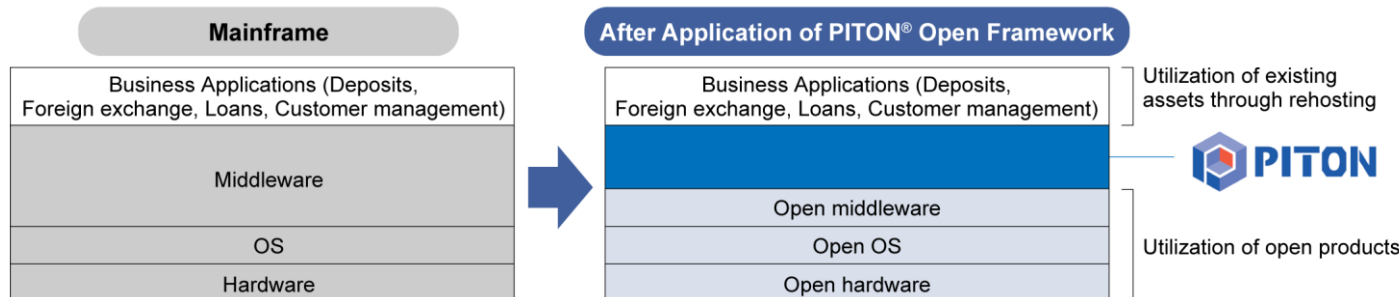
Conceptual diagram of PITON®

[Click here for reference article](#)

Connecure®

Safe, Secure, and Rapid Data Transmission with High Reliability Closed-System Service

Smart X Co-Innovation Trusted Value Chain

SOCIAL ISSUES
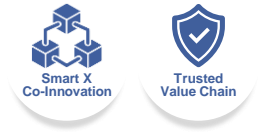
· As remote work adoption progresses, companies are increasingly vulnerable to cyberattacks, resulting in significant economic losses.
· According to a survey conducted by the Information-Technology Promotion Agency, Japan on cyberattacks targeting small and medium-sized enterprises in fiscal 2022, it was found that up to 11.6% of the 43 surveyed companies reported experiencing information security incidents over the past three years.

8 DECENT WORK AND ECONOMIC GROWTH 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

The rapid spread of remote work, including telecommuting, was propelled by the COVID-19 outbreak, resulting in the widespread adoption of cloud services. These services offer significant benefits, enabling tasks similar to those performed in-office even while working remotely. However, the use of networks accessible from anywhere, such as the Internet, poses risks such as cyberattacks and information leaks from external sources. Consequently, many companies and organizations are hesitant to embrace these services.

Offered by NTT DATA, Connecure® utilizes a closed-network environment isolated from the Internet, ensuring protection against threats such as information leakage,

virus infection, and eavesdropping. This approach guarantees a level of security comparable to dedicated line services. In addition, measures such as distributing access points to mitigate the effects of disasters and implementing configurations with different carrier lines are taken to ensure highly reliable service. As of February 2024, the number of installations had exceeded 1,500. Furthermore, it is possible to reduce data transmission time by approximately 94% compared to conventional methods.

Connecure® will continue to incorporate technologies such as IoT and digital twins to further enhance its capabilities and evolve.

- Can connect to various service centers
- Safe and secure network security
- Highly reliable network capable of handling financial transactions
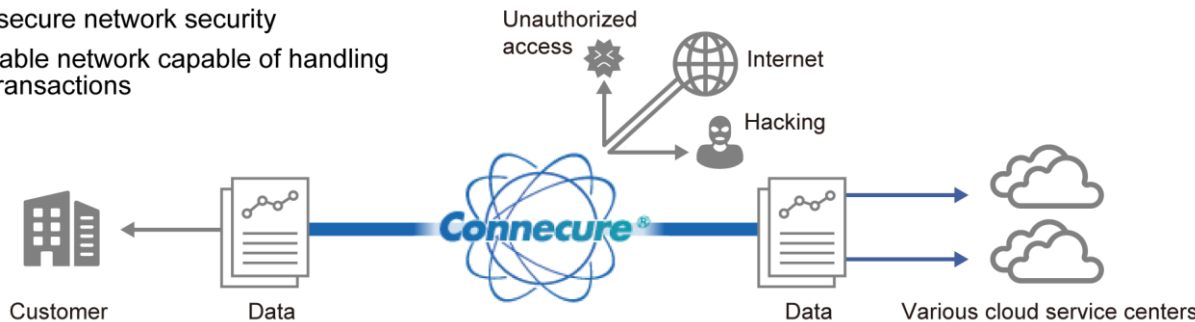
Data transmission time (compared to conventional methods)

Approx. **94% reduction possible**

Incidents of damage due to unauthorized access at roughly 1,500 companies after introducing Connecure®

0

Image of Connecure® service

[Click here for reference article](#)

AI Governance

Achieving a Society Where Humans and AI Coexist in Harmony

Trusted Value Chain

Human Rights & DEI

SOCIAL ISSUES

· Artificial intelligence (AI), with its high processing and learning capabilities, addresses challenges such as creating new businesses and mitigating labor shortages. However, it also raises issues regarding user literacy and regulation, including discrimination, human rights violations, and and dissemination of misinformation.

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Generative AI, represented by ChatGPT, now boasts accuracy approaching human capabilities, making it accessible to the general user. However, its use requires addressing risks such as inaccurate responses leading to misjudgments, information leaks, and infringement upon the rights of others.

NTT DATA is advancing collaborative trial implementations of innovative AI solutions with customers under the principles of "promotion" and "control," actively supporting their business transformations. In addition, the NTT DATA Group is expanding and sustaining governance efforts, including the formulation of the NTT DATA Group's

AI Guidelines to facilitate the coexistence of humans and AI.

At the AI Advisory Board comprised of external experts, frontline employees involved in AI projects also participate in discussions, contributing to concrete measures for governance.

In April 2023, we established the AI Governance Office, a specialized organization dedicated to promoting the ethical use of AI. The office has developed and disseminated internal guidelines outlining considerations and response strategies for the utilization of generative AI, ensuring the provision of services using generative AI to customers in a safe and trustworthy manner.

Number of incidents involving AI-related human rights violations

0

As of February 2024, since the establishment of the AI Governance Office on April 1, 2023.
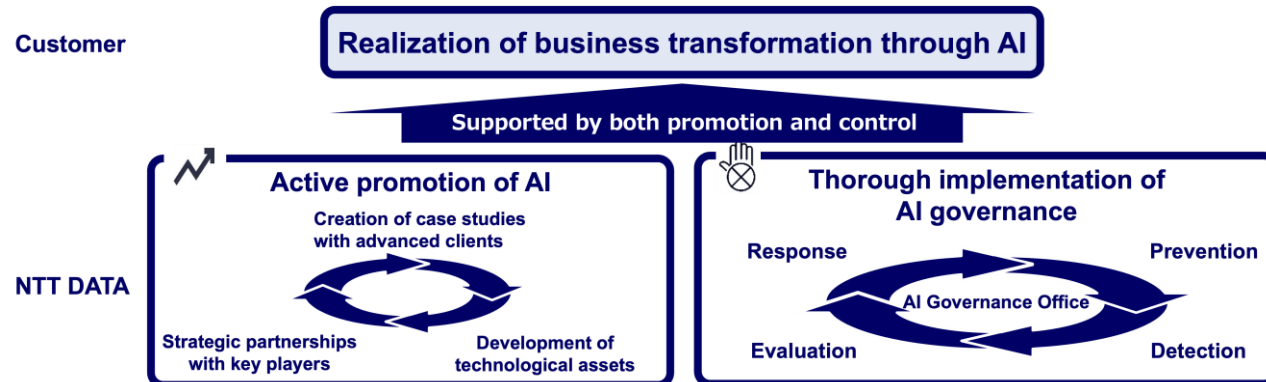
Conceptual diagram of AI governance

Click here for reference article

Tourism Data Platform

Supporting Sustainable Tourism in Denmark Through Data Analysis

Smart X Co-Innovation

Community Engagement

SOCIAL ISSUES

· Tourist trends are challenging to predict, potentially wasting resources and energy.
· Over-tourism places an increased burden on residents' quality of life and the natural environment.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

15 LIFE ON LAND

In the tourism industry, where services are consumed as soon as they are provided and forecasting tourist demand is challenging, there are high levels of waste and overconsumption of resources.

In response, NTT DATA Business Solutions has developed and implemented a Tourism Data Platform in Denmark, engaging all stakeholders in the tourism ecosystem, including public institutions, hotels, restaurants, transportation, attractions, and retail, to contribute information for data analysis. The gathered data encompasses visitor numbers, nationalities, vehicle movements, purchases, social media posts, and water consumption in hotels, aiding in the forecasting of people flows and demand.

With the help of the platform, the accuracy of tourist predictions has surged from 30–60% to over 90%. This enhancement empowers tourism operators to strategically handle procurement and staff allocation, thereby reducing excessive waste and contributing to heightened satisfaction among both visitors and residents.

The aim is to provide such data to visitors and expand to other countries, supporting the realization of

sustainable tourism and fostering ongoing development in the environment, culture, and economy of tourist destinations.

Photo: Nataliya Nazarova via Shutterstock

Accuracy of demand forecasting in the tourism industry

More than 90%

[Click here for reference article](#)

Data Reduction Challenge

Reducing Data Volume for Lower Power Consumption and More Sustainable IT

Smart X Co-Innovation

Future of Work

Carbon Neutrality

SOCIAL ISSUES

· The use of cloud services is expanding worldwide primarily due to DX and AI, leading to an increase in the number of data centers and data volume in various regions.
· The Center for Low Carbon Society Strategy, Japan Science and Technology Agency, predicts that global data center power usage will increase 4,300 times from 2016 to 2050.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Decreasing data volume is crucial for lowering the power consumption of data centers and promoting the sustainability of IT. Natuvion GmbH, specializing in SAP S/4HANA migrations, cloud transfers, and data management, is actively engaged in the Data Reduction Challenge. This initiative focuses on diminishing data volume by implementing projects related to data migration, management, and cloud transfers.

In each project, Natuvion collaborates with the customer by sharing not only aspects such as cost and data security but also data reduction goals. This information is also shared internally. The amount of data reduced is reported in terabytes from the pre-execution phase.

In a leading toy manufacturing company in Denmark that implemented the data management system, the initial data was reduced from 13 terabytes to 11 terabytes. In addition, a large business process service provider in the energy sector achieved a 50% reduction in data volume by deleting unnecessary data during migration to SAP System Cloud.

Natuvion GmbH carries out around 100 to 150 projects each year and remains committed to advancing

sustainable information systems through the delivery of specialized expertise and the company's product offerings.

Photo: Gorodenkoff via Shutterstock

Reduction in data in energy-related service companies

50%

[Click here for reference article](#)

AVATAR

Predictive Maintenance in Aircraft Equipment: Anticipating Deterioration and Failures to Extend Component Service Life

Smart X Co-Innovation

Carbon Neutrality

SOCIAL ISSUES

· Airports in major cities worldwide are facing congestion issues during aircraft takeoffs and landings, making it crucial to safely and efficiently manage the departure and arrival of numerous flights without delays.
· Environmental concerns, including noise pollution for residents near airports due to equipment aging, and rising CO_2 emissions from fuel consumption, call for proactive measures.

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
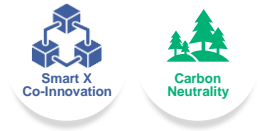
The AVATAR (Transformative Digital Air Vehicle with IoT Sensor for Safer Urban Skies) project is part of Horizon 2020, an EU R&D program, with a budget of around 80 billion euros.

NTT Luxembourg is in a consortium of six partners to develop an IoT sensing skin and digital twin platform that will enable continuous monitoring of aircraft. This optimizes the service life, which contributes to sustainable air mobility and the acceleration of the digital transformation of aviation vehicles.

The IoT sensing skin will collect data from various sensors embedded in the aircraft structure, such as strain, temperature, pressure, vibration, and acoustic emission. The data will be transmitted to a cloud-based platform, where advanced algorithms will process and analyze it, creating a digital twin—a virtual replica of the physical aircraft, which can simulate its behavior, performance, and condition in real time.

The digital twin platform will provide valuable insights for the aircraft operators, manufacturers, and maintenance providers, enabling them to optimize the service life of each aircraft and its components, reduce operational costs, and improve safety and reliability. The

digital twin platform will also support the design and certification of novel solutions for urban air mobility, such as electric or hybrid unmanned vehicles, which have the potential to reduce noise and emissions, and increase the accessibility and affordability of air transport.

AVATAR is a visionary and ambitious project that will have a significant impact on the economic and environmental sustainability of urban air mobility. AVATAR is a project that will make air transport smarter, more sustainable, connected, and accessible to all.

Image of AVATAR project

Reduction in fuel consumption per flight

2.5%

The London School of Economics predicts that the benefits of Connected Airline Operations enabled by SATCOM will reduce fuel consumption per flight by 2.5%, resulting in an annual reduction of 21.3 million tons of CO_2 emissions.

Reduction in direct operating costs through equipment failure prediction and maintenance

30%

[Click here for reference article](#)

[Click here for the refence video](#)

Inclusive Society

fowald™

Promoting Community Contribution Activities in Local and Affiliated Areas

Community Engagement

SOCIAL ISSUES

· In Japan, while awareness of the term "SDGs" is increasing, proactive actions remain limited, and there are still many challenges in providing opportunities to encourage individual actions and in promoting understanding.

· According to the "2022 Survey on Social Contribution of Citizens" announced by the Cabinet Office, only 17.4% of respondents reported having volunteered within the past year.

3 GOOD HEALTH AND WELL-BEING

11 SUSTAINABLE CITIES AND COMMUNITIES

NTT DATA has developed a platform called fowald™ to break down barriers between corporations, municipalities, and residents, fostering collaboration toward the common goal of achieving a sustainable society. On this platform, corporations and municipalities can publish themed "quests", which residents can easily engage with. Those who resonate with these quests can engage in community contribution activities in their local or affiliated area, post about their experiences, and contribute back to supported causes, affiliated companies, or communities. Furthermore, corporations and municipalities can digitally visualize residents' community contribution activities, allowing for quantitative and qualitative measurement to drive further improvements, enhance external appeal, and improve brand image.

In past experiments, we collaborated with shopping district promotion associations on photo contests to revitalize the community, garnering enthusiastic participation and making significant contributions to local revitalization. This approach also led to increased participant engagement when applied to internal contribution activities.

Through fowald™, NTT DATA not only supports individuals in taking the first step toward sustainable activities but also contributes to creating an environment conducive to their ongoing implementation.

Image of fowald™

Number of participants in community contribution activities after introducing "Quests"

Up 36%

Click here for the service page

Down load here (iOS/Android)

D-Resilio®

Digital Disaster Management Platform for Streamlining Disaster Response

Community Engagement

SOCIAL ISSUES

· Natural disasters are becoming more frequent and severe, compounded by threats such as infectious diseases.
· It is essential to establish mechanisms for real-time coordination and dissemination of vital information during disasters.

13 CLIMATE ACTION **17 PARTNERSHIPS FOR THE GOALS**

In a disaster, it is essential to swiftly communicate information, assess damage, and coordinate with local authorities and relevant businesses. However, the current reliance on scattered information and methods like phone calls and faxes results in time- and resource-intensive responses. Establishing precise and efficient disaster management procedures is therefore imperative.

NTT DATA's digital Disaster Management Platform, D-Resilio®, leverages digital technology to streamline disaster response operations, combining solutions such as satellite and drone-based damage assessment, data visualization, AI-driven analysis, and information sharing. We integrate administrative data such as L-alerts with various other datasets such as social media and traffic records to enhance information gathering efficiency and support predictive disaster prevention measures.

Recently, leveraging expertise from D-Resilio® development, we have advanced the creation of disaster information transmission systems in both Japan and Indonesia, enhancing global disaster response capabilities.

Swift collection of disaster information through drones

Time to gather information on remote island coastlines and ports

Reduced to 1/3

60 mins[1] → 20 mins[2] (approx.)

2 people sent from main or branch office

Unmanned and do not have to wait for safety assurance

1. Estimated time for movement, patrol, and confirmation on island, assuming 20 km/h
2. Time for island survey in Tokyo Metropolis, Izu Oshima, during demonstration

Personnel sent from main/branch office for information gathering

Reduced by 100%

[Click here for reference article](#)

D-Resilio Viewer

Information gathering support · Sensor data · Weather information · Drone · Satellite imagery · Social data · Emergency response support · Establishment of staff assembly HQ · Simultaneous information distribution · Decision support · Chronology · Reporting · Dashboard · Swift livelihood rebuilding · Restoration and reconstruction support

D-Resilio

Conceptual diagram of D-Resilio®

V-BALLER

VR-Driven Training System Supporting High School Baseball Practice on Remote Islands

Community Engagement

SOCIAL ISSUES

· Disparities in access to and quality of education are arising due to differences in residential areas and environments.
· Opportunities for sports activities are decreasing due to the declining birth rates.

3 GOOD HEALTH AND WELL-BEING | 4 QUALITY EDUCATION | 11 SUSTAINABLE CITIES AND COMMUNITIES

Disparities in education opportunities and quality based on residential areas and environments of high school baseball players pose various challenges.

NTT DATA has developed a training system called V-BALLER, utilizing virtual reality (VR) to achieve 3D sensory training. It provides new insights by visualizing the performance skills of hitters. Players can practice tough tasks such as hitting 150 km/h fastballs, which are difficult to replicate in real life. They can also improve their ability to distinguish strikes from balls, adapt to both right-handed and left-handed pitchers, and handle various types of breaking balls.

A survey conducted during remote coaching sessions using V-BALLER at Shimane Prefectural Oki High School revealed that not only technical and physical aspects but also mental preparation and confidence could be improved. The system received high praise from players, managers, coaches, and other stakeholders.

We received feedback from island residents who desire enriching experiences for their children where they were born and raised, without the need to leave for baseball, and to be able to pursue their dreams while remaining on the island. Inspired by these narratives, we believe that V-BALLER can play a meaningful role in supporting children from remote islands, such as those in Oki High School.

Moving forward, we plan to expand our services both domestically and internationally, catering to professionals and amateurs alike. Our initial objective is to set a new benchmark in the sports industry, beginning with baseball, by harnessing the power of digital technology.

Remote instruction using V-BALLER

Percentage of individuals who strengthened mental and physical aspects by using VR

Based on a controlled experiment comparing the VR user group to the non-user group.

Mental **60%** Non-user group 50%

Physical **60%** Non-user group 31%

[Click here for reference article](#)

Utilization of Connected Car Data

Assessing Brain Health from Daily Driving Behavior for Early Detection of Cognitive Decline and Accident Prevention

Community Engagement

Smart X Co-Innovation

SOCIAL ISSUES

· It is projected that the proportion of individuals aged 65 and older in the global population will increase from 9.4% in 2020 to 18.7% by 2040, indicating a rapid advancement in aging trends.
· Japan has one of the highest aging rates in the world.

3 GOOD HEALTH AND WELL-BEING

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

An example of the societal impact of dementia is the increase in traffic accidents, particularly involving elderly drivers who constitute a significant portion of dementia patients, contributing to a rising trend in Japan. While advancements in early detection and treatment of dementia have made it possible to delay its progression, individuals in the pre-dementia stage of mild cognitive impairment might not recognize symptoms, leading many to seek medical attention only after developing dementia.

NTT DATA has commenced a verification experiment in collaboration with Kokusai Motorcars Co., Ltd., a passenger transportation company including taxis, to develop a system for identifying drivers' cognitive abilities and detecting unsafe driving behaviors. In conjunction with Eisai Co., Ltd.'s self-check tool for assessing brain health, NTT DATA will install GPS and measurement devices in taxi vehicles to collect driving data from drivers. The collected data will be transmitted to the cloud and analyzed by AI, where it will be correlated with the driver's brain health to develop algorithms (methods of calculation) for identifying cognitive function. This will enable the estimation of drivers' brain health status from their daily behaviors and provide regular notifications, contributing to the early detection of cognitive decline and reducing the occurrence of traffic accidents.

Proportion of fatalities in all fatal traffic accidents attributed to elderly drivers

12.9%

(Source: Analysis of fatal accidents caused by elderly drivers in 2017 released by the National Police Agency.)
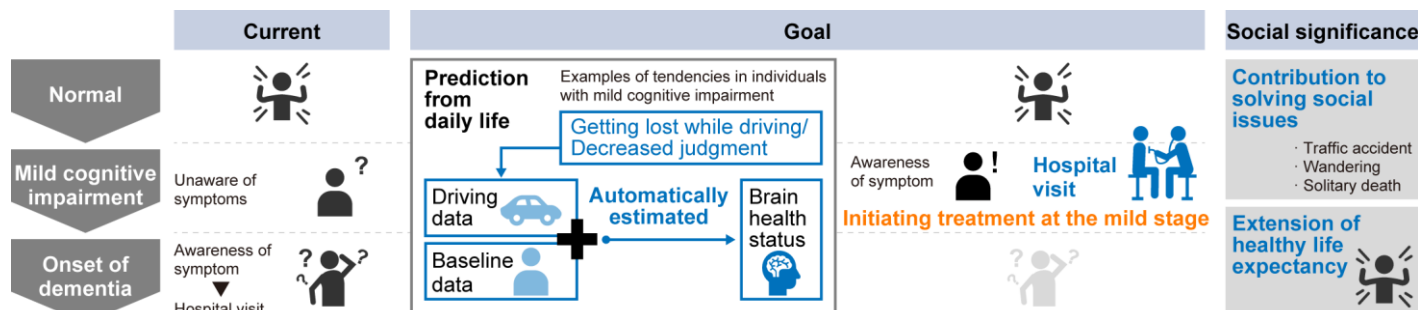
Conceptual diagram of verification experiment

[Click here for reference article](#)

Wingcopter

Delivering Medical Supplies Quickly and Efficiently to Safeguard Lives in Malawi

Digital Accessibility

Community Engagement

SOCIAL ISSUES

· Insufficient development in logistics infrastructure, such as roads, results in delayed supply of goods, making life challenging for residents.
· The creation of new employment opportunities is essential in developing countries and sparsely populated regions.

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

13 CLIMATE ACTION

In the remote regions of the Republic of Malawi in Southeast Africa, the lack of developed road infrastructure has led to delayed deliveries of medical supplies, making them less readily available in times of need. NTT DATA Business Solutions AG is collaborating on a project to establish a medical supply chain using high-performance drones from Wingcopter GmbH, providing a highly scalable service platform.

Digitizing information from drones enables the efficient and precise delivery of medical supplies, enhancing reliability and speed in urgent medical drone transportation. To date, medical supplies have been delivered to more than 115,000 people in remote areas of Malawi.

Efforts are also under way to provide education for local residents to acquire qualifications in air traffic control and drone piloting, thereby creating employment opportunities.

Going forward, the plan is to expand operations to remote areas and disaster-stricken regions in other countries, offering avenues for improved health, safety, and quality of life for the people.

Impact of drone deliveries in Malawi

Reduced time to deliver medical supplies

by 96%

Slashed from full day to 20 minutes

Number of individuals reached

More than 115,000

[Click here for reference articles](#)

[Click here for reference articles](#)

A drone delivering medical supplies

World's First Smart Rainforest

Tropical Rainforest Regeneration Business Created from Employee-Driven Social Contribution

Community Engagement

Nature Conservation

SOCIAL ISSUES

· Since the 20th century, tropical rainforests have faced advancing destruction due to illegal logging and agricultural development, with projections suggesting their potential disappearance within the next 40 years, leading to the extinction of up to 50,000 species annually.

8 DECENT WORK AND ECONOMIC GROWTH

13 CLIMATE ACTION

15 LIFE ON LAND

Tropical rainforests, often referred to as the "lungs of the Earth," not only regulate the carbon dioxide cycle by supplying oxygen through trees but also nurture biodiversity. The Daintree Rainforest, adjacent to Australia's Great Barrier Reef, is recognized as a UNESCO World Heritage Site, representing one of the world's oldest tropical rainforests. However, decades of agricultural development have led to the destruction of much of its land.

NTT DATA, Inc. and the Australian NGO ClimateForce have formed a partnership aimed at establishing sustainable and cost-effective models for environmental restoration activities. The catalyst for this partnership was the involvement of Team NEST—an Employee Resource Group (ERG)* within NTT DATA, Inc., tackling environmental issues. Team NEST provided support for ClimateForce's Arctic research, exemplifying how employees' social contribution activities can lead to tangible business outcomes.

NTT DATA supports forest regeneration by providing technology such as the Smart Management Platform, which utilizes AI to collect, accumulate, manage, and analyze data, as well as evaluate and analyze forest regeneration technologies. In addition, we support

ClimateForce's operations by providing funding to plant 1,000 trees. Through these efforts, more than two million square meters of land within the Daintree Rainforest have been regenerated.

NTT DATA plans to expand the insights gained from the project to other regions and continue supporting the creation of sustainable models aimed at revitalizing regional economies alongside land and ecosystem regeneration.

Team NEST provided support for Arctic research

Land regenerated through the project

More than
2 million ㎡

* ERG (Employee Resource Group) :
A group of employees with shared characteristics, values, and awareness of issues who actively engage in activities both within and outside the company.

[Click here for reference article](#)

HAWK

Contribution to Eradicating Illegal Wildlife Trade in India

Community Engagement

SOCIAL ISSUES

· Poaching of endangered wildlife continues unabated worldwide. In October 2023, the International Criminal Police Organization (Interpol) and the World Customs Organization (WCO) announced that they cracked down on global illegal wildlife trade, arresting more than 500 individuals and seizing more than 2,000 specimens of flora and fauna.

15 LIFE ON LAND

Products made from wildlife materials such as ivory accessories and fur coats command high prices due to their rarity. Some individuals engage in poaching for their livelihoods, leading to continued illegal trade and endangering countless wild animals.

NTT DATA, Inc. has partnered with the Wildlife Trust of India to combat this issue in the Indian states of Kerala and Karnataka. Together, they are utilizing Hostile Activity Watch Kernel (HAWK), a real-time critical information management system developed jointly. The focus is on countering criminal organizations targeting high-value products such as ivory and tiger skins. This involves monitoring wildlife carcasses and criminal activities while integrating information on various related incidents, enabling centralized management for effective and preemptive responses. Currently, the system has recorded more than 38,000 incidents and identified 54,000 suspects. The state forest departments benefit from advanced digital tracking and analytical capabilities provided by this data.

Moreover, continuous training is being provided to forest officers to empower them to autonomously utilize the HAWK system. Plans are in place to transition to government management at the end of the three-year

project period. This transition aims to reduce dependence on external funding and foster ongoing innovation to deliver tangible environmental and social outcomes.

Photo: Svetlana Foote via Shutterstock

Number of suspects involved in illegal wildlife trade identified using HAWK

54,000

[Click here for reference article](#)

Social Contribution (Global Case Studies)

Utilizing its technological expertise, NTT DATA has actively pursued diverse social contribution endeavors on a global scale, including educational and employment support, biodiversity conservation, enhanced healthcare accessibility, and assistance for marginalized communities. Below, we provide a glimpse into some of these efforts (with FY2023 projections).

»TEAMING

Area: Europe Period: FY2022–2023

Provided funding for the social initiatives of many NPOs using an online micro-donation platform allowing support with just one euro per month

381,055

€ 52,250,313

»COACH AND EDUO PROJECTS

Area: Spain Period: FY2022–2023

Helped to enhance student employment motivation and create job opportunities through vocational training projects for young people

114

€ 12,000

» GIRLS GOONA

Area: Spain Period: FY2022–2023

Provided STEAM education for children with the aim of overcoming gender bias in the field of technology

»ALLIANCE WITH TECHNOVATION GIRLS

Area: Europe Period: FY2021–2023

Nineteen teams from NTT DATA EMEAL took part in Technovation Girls, an app development contest, mentoring participants as volunteers

240

€ 17,000

»SECURITY NINJA

Area: Italy Period: FY2022

Security experts from NTT Data Italia provided classes for children to master the correct usage of the Internet and social media, fostering literacy

1,300

»CONSERVING 300+ELEPHANTS

Area: India Period: FY2023

Provided technology to reduce forest-related crimes in Karnataka, protecting more than 300 elephants while minimizing human-animal conflicts

More than 300

»SUPPORTING STEAM & ROBOTICS PROGRAM

Area: India Period: FY2023

Provided a robotics engineering program to 13,000 students in 10 schools across India, supporting STEAM education for 2,500 individuals

15,500

»TAKING ACTION AGAINST HUNGER

Area: North America→India Period: FY2023

Collaborated with the North Texas Food Bank to provide meals for children in Karnataka, India

35,000

»DOMESTIC SOCIAL CONTRIBUTION ACTIVITIES

See P36

»BRAZIL INTERNSHIP PROGRAM

Area: Brazil Period: 2023

Implemented an internship program focusing on soft skills rather than technical knowledge or degrees, aimed at attracting talented professionals from underrepresented minorities

170

» World's First Smart Rainforest

See P33

»EARTH TO OCEAN

Area: North America Period: FY2023

Conducted the Earth to Ocean CSR campaign, with 1,700 employees taking part as volunteers

1,700 (volunteers)

» PENANUT BUTTER DRIVE

Area: North America Period: FY2023

Provided $100,000 to the North Texas Food Bank and created volunteer opportunities for employees

$ 100,000

»TALENT CAMPS

Area: Argentina Period: FY2022

Conducted technical training workshops, including programming, with the Buenos Aires Institute of Technology to support university students in career development

68

Social Contribution (Domestic Case Studies)

NTT DATA leverages the Group's technological expertise to contribute to various social initiatives in Japan. We prioritize IT education to cultivate the next generation of IT talent, offering a wide range of programs for elementary and junior high students, while supporting IT education for nonprofit organizations and other groups.

Note: The number of participants, donation amounts, number of books, etc., are based on fiscal 2023 results. The number of users of anaphylaxis response support tools is the cumulative total since 2021.

Health

JOINT DEVELOPMENT OF ANAPHYLAXIS SUPPORT TOOLS
Approx. **1,500**

Area: Nationwide (mainly Kobe)

Partnered with the Kobe-based Foundation for Biomedical Research and Innovation/Kobe City Medical Center General Hospital since 2021 to offer a smartphone tool for quick reference on dealing with food allergies when they occur

Education
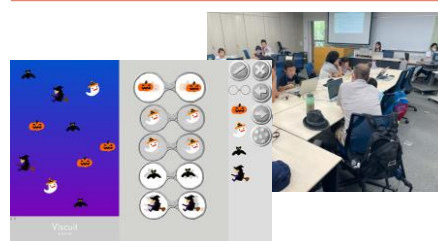
NTT DATA ACADEMY
1,745 (parent-child)

Area: Nationwide

Since fiscal 2020, NTT DATA has been conducting an IT education program called NTT DATA Academia targeting elementary school students to impart knowledge about programming and IT systems.

Next Generation IT Talent Development for Junior High School Students

YONONAKA GAKU IT EDUCATION
18,208

Area: Nationwide

NTT DATA and ARROWS Inc. provide IT classes to junior high students nationwide with the theme of creating the future with IT to nurture next-gen IT talent

NPTech INITIATIVE
192

Area: Nationwide

Training programs are provided by NTT DATA, Dell Technologies, Intel, TIS, and the Japan NPO Center to support NPOs by enhancing their utilization of IT technology

Donations

TURKEY EARTHQUAKE

Area: Turkey

¥ 30,000,000

*Donations made as the NTT Group in March 2023

NOTO PENINSULA EARTHQUAKE

Area: Hokuriku region

¥ 50,000,000

* Donations made as the NTT Group in January 2024

USED BOOK/FOOD DONATIONS
Approx. **3,000** books
106 kg

Area: Nationwide

NTT DATA DAICHI donated used books to NPO Chino Atelier, which fosters the inclusion of people with disabilities and community revitalization, and collected surplus food to donate to a food bank

Environmental Preservation

SATOYAMA CONSERVATION
47

Area: Nationwide

Satoyama conservation activities at the Niiharu Satoyama Exchange Center in Yokohama City, Kanagawa Prefecture, include rice paddy fertilization, building maintenance, and workshops

SATOYAMA FARMING EXPERIENCE
60

Area: Kanagawa Prefecture

Since 2022, CIJ and NTT DATA have jointly conducted farming experience programs at mandarin farms in Oimachi, Kanagawa Prefecture. Since 2023, they have been certified as Oimachi SDGs Partners

CASE STUDY INDEX